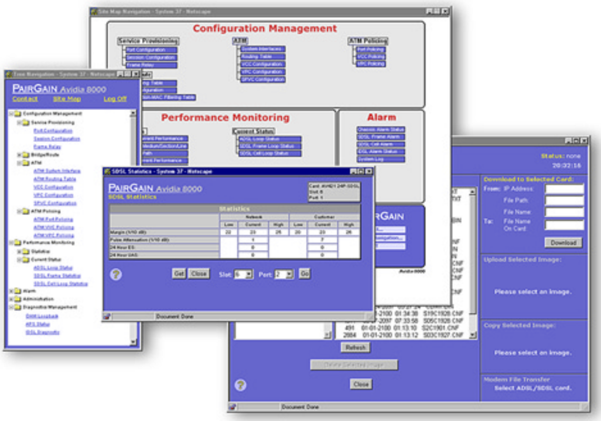
# Avidia

## System Configuration and Management User Manual



## SwitchWare Version 2.0

Catalog Number
SWD4573I1

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# About This Manual

This manual documents the new configuration and management features included in SwitchWare Version 2.0.

This manual is intended for system engineers responsible for configuring and managing an Avidia System. It assumes a basic understanding of voice and data communications, including xDSL and ATM technologies. This manual is organized as follows:

*Part I: Introduction and Setup*

The chapters in this section provide an Avidia system configuration and management overview, and specific instructions for preparing to configure and manage a system. This section also provides an overview of applications and features of the Avidia system. These overview sections also indicate procedures you must complete using either the command-line interface or the Web interface to implement these features.

*Part II: The Avidia command-line interface*

These chapters provide instructions for configuring a system, monitoring performance, and maintaining and administering a system using the Avidia system command-line interface.

*Part III: The Avidia Web interface*

These chapters provide instructions for configuring a system, monitoring performance, and maintaining and administering a system using the Avidia system Web interface.

*Appendix A* provides guidance for troubleshooting and diagnostics.

*Appendix B* provides information about obtaining technical support, Avidia product warranty and return procedures.

*Appendix C* provides a key to generated error message codes.

*Appendix D* provides a glossary of the terms used in this manual.

# DOCUMENT CONVENTIONS

Two types of messages, identified by icons, appear throughout the document:

**Notes contain information about special circumstances.**

**Cautions indicate the possibility of equipment damage or the possibility of personal injury.**

# COMMAND-LINE INTERFACE CONVENTIONS

The following typeface conventions are specific to the Command-Line Interface chapters of this manual.

- **`Bold courier type`** indicates text to be typed exactly as shown.
- `Unbolded courier` type indicates onscreen messages or prompts.
- `<Angle Brackets>` indicate a parameter for which you need to provide an appropriate value.
- `[`Square Brackets`]` indicate an optional parameter.
- `[<Angle brackets within square brackets>]` indicate an optional parameter that, should you include it, requires you to provide an appropriate value.
- `(`**`Multiple|Values`**`)` in parenthesis separated by a vertical line indicate that you must select one of the values for that parameter. However, parentheses may also contain parameters for which you need to provide a value. For example, `(`**`all`**`|<port>)` indicates that you can type **`all`** to view all ports or type a port number to view a specific port.
- Some optional parameters contain both a command and a parameter for which you need to select from a finite set of values. For example, [**`-admin (up|down`**`)`] requires you to type **`-admin up`** or **`-admin down`**, should you choose to include the parameter. Optional parameters follow the required parameters in the command line, and can be included in any order.
- *Italic* type indicates the format in which you type the information specified in the procedure.

# WEB INTERFACE CONVENTIONS

The following typeface conventions are specific to the Web-Based Interface chapters of this manual.

- **This font** indicates a reference to an element on the screen.
- *Italic* type indicates the format in which you type the information specified in the procedure.

# SUMMARY OF CHANGES FOR VERSION 2.0

The following are features of the Avidia SwitchWare Version 2.0 software release:

- Avidia 2200 remote chassis with three slots including:
  - a combination DS1 and management card
  - ADSL user interface card
  - POTS splitter card
- subtending for Avidia 2200 remote chassis
- SDSL cell-based user interface card
- IDSL frame-based user interface card including:
  - Avidia system support for TLS, RAMP1483, and PPP services
  - physical-layer loopback test
- Frame Relay for use with IDSL frame-based user interface card, including selection for either FRF.5 or FRF.8 interworking
- card redundancy
- dual homing including redundant VCCs and VPC and static load-sharing
- rt-VBR and nrt-VBR traffic classes
- OAM F4 flow loopback

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# PART I

## INTRODUCTION AND INITIAL SETUP

This section contains the following chapters, which provide an overview of Avidia system configuration and management and specific instructions for preparing to configure and manage a system.

# AVIDIA SYSTEM CONFIGURATION AND MANAGEMENT OVERVIEW

# 1

Each Avidia® system provides two different user interfaces for system configuration and management. Both interfaces are preinstalled on the management card.

The command-line interface provides comprehensive system configuration and management features using a text-only interface. You access the command-line interface using either an ASCII terminal or a PC running a terminal emulation program, connected to the management card craft port. Once the management card IP address is configured, you can also access the command-line interface remotely using a telnet application. The command-line interface contains a hierarchy of different prompts, at which you type commands to perform a particular configuration or management task.

The Web interface is a graphical user interface (GUI) that provides the most of the system configuration and management features in the command-line interface, as well as additional security features. You access the Web interface using a PC connected to the Fast Ethernet port on the back of the Avidia chassis, or over a network. The Web interface provides two different styles of navigation — the Site Map Navigation window and the Tree Navigation window. From either navigation window, you select the configuration or management task you want to perform.

# CONFIGURATION FEATURES

The Avidia system enables you to configure:

- system information, such as system name and location, contact, date and time
- management card IP address, subnet mask, and default gateway
- trap receivers and trap generation status
- community strings
- ATM traffic profiles that define the traffic type and Quality of Service (QoS) on a specific channel. ATM traffic profiles are applied to permanent Virtual Channel Connections (VCCs) and Virtual Path Connections (VPCs) during configuration.
- ATM VCC, VPC, and port policing
- bridging and routing sessions
- Frame Relay traffic profiles that define the traffic type and Quality of Service (QoS) on a specific channel. Frame Relay traffic profiles are applied to Permanent Virtual Channels (PVCs) during configuration. You can also specify either FRF.5 or FRF.8 interworking.
- ADSL cell-based card line profiles that define the rate mode, target margin, minimum and maximum interleave transmit rate, and interleave depth. ADSL line profiles are applied to ADSL channels during configuration.
- ADSL cell-based card alarm profiles that define the Loss Of Frame (LOF), Loss Of Signal (LOS) and Errored Seconds (ES) thresholds. ADSL alarm profiles are applied to ADSL channels during configuration.
- SDSL cell-based card line profiles that define the rate mode, target margin, minimum and maximum interleave transmit rate, and interleave depth. SDSL cell line profiles are applied to cell-based SDSL channels during configuration.
- SDSL cell-based card alarm profiles that define the Loss Of Frame (LOF), Loss Of Signal (LOS) and Errored Seconds (ES) thresholds. ADSL alarm profiles are applied to ADSL channels during configuration.

- SDSL frame-based card line profiles that define the transmission rate. SDSL line profiles are applied to SDSL channels during configuration.
- SDSL frame-based card alarm profiles that enable or disable margin, ES, Unavailable Seconds (UAS) and Loss of Sync Word (LOSW) alarms and define the alarm thresholds. SDSL alarm profiles are applied to SDSL channels during configuration.
- IDSL frame-based card line profiles that define the transmission rate. SDSL line profiles are applied to SDSL channels during configuration.
- IDSL frame-based card alarm profiles that enable or disable margin, ES, Unavailable Seconds (UAS) and Loss of Sync Word (LOSW) alarms and define the alarm thresholds. IDSL alarm profiles are applied to IDSL channels during configuration.
- ADSL cell-based service, including assigning ADSL line and ADSL alarm profiles
- SDSL cell-based service, including assigning cell-based SDSL line and SDSL alarm profiles
- SDSL frame-based service, including assigning frame-based SDSL line and SDSL alarm profiles
- IDSL frame-based service, including assigning IDSL line and IDSL alarm profiles
- xDSL subscriber names to identify the subscriber to which each port is connected
- ATM service, including setting up cell channel card VCCs and VPCs, and frame channel card (SDSL frame-based and IDSL) VCCs
- Frame Relay service, including setting up PVCs for IDSL card
- OC3 service (SONET or SDH), with Automatic Protection Switching (APS)
- DS1/T1 service, including specifying line type, line code, circuit identifier, line length, clocking type, and enabling or disabling DS1/T1 traps
- DS3 service, including specifying line type, line length, clocking type, and enabling or disabling DS3 traps

# PERFORMANCE MONITORING FEATURES

The Avidia system enables you to display or monitor system status. The following status can be seen through the Avidia command-line interface:

- ATM PVC and PVP connection statistics
- APS status
- bridge and STP port status
- system bridge/STP statistics, including bridge forwarding statistics
- system IP statistics
- ADSL loop status and performance history
- SDSL cell statistics and performance history
- SDSL frame statistics and performance history
- IDSL statistics and performance history
- SDSL CPE statistics
- SONET status and performance history, by Medium, Section, Line and Path
- DS1/T1 status and performance history
- DS3 status and performance history
- system physical interface statistics, all at once or by slot
- ATM cell switch interfaces
- system log
- system alarms and event status
- SDSL alarm history
- IDSL alarm status

The following status can be seen through the Avidia Web interface:

- statistics
  - IDSL current performance
  - SONET medium/section/line
  - SONET path
  - DS1 current performance
  - DS3 current performance
  - physical slot interfaces
- current status
  - ADSL loop status
  - SDSL frame loop status
  - SDSL cell loop status

# SYSTEM ADMINISTRATION AND DIAGNOSTIC FEATURES

The Avidia system enables you to perform the following administrative functions:

- copying, deleting and displaying a directory of files using a DOS-like file system
- uploading files to and downloading files from a TFTP server
- downloading files to modems
- displaying system inventory, including hardware serial numbers and software version numbers
- viewing CPE general information
- rebooting individual cards
- setting the system time-out value and Web-Based Interface performance data refresh rate
- activating and deactivating ports
- configuring and initiating OAM F4 and F5 flow loopbacks
- APS configuration and status
- IDSL diagnostics

# AVIDIA SYSTEM FILE MANAGEMENT

Each Avidia line, channel, and management card ships with the necessary system files preinstalled in NVRAM (Non-Volatile Random Access Memory).

## Restoring System Files

To restore system files for a card, copy a complete set of system files from the Avidia MuxWare™ CD-ROM to that card. See “Managing Image Files” on page 354 for command-line interface instructions or “Managing Image Files” on page 571 for Web interface instructions.

## How Image Files are Used

Each card in the Avidia system contains its own image files, which are stored in NVRAM and have a .bin file name extension. Image files contain the firmware and software required to use the hardware on which they reside. When you boot the Avidia system, each card runs a bootstrap program that retrieves the image file out of NVRAM, decompresses it, then loads it into Random Access Memory (RAM). The firmware runs from RAM during system operation.

## How Configuration Files are Used

All configuration information for the Avidia system is stored permanently in the management card NVRAM. There is a separate ASCII configuration file for each card. The files are named S*nn*C*xxxx*.cnf, where *nn* is the slot number and *xxxx* is the part number for that card.

During system startup, each line card and channel card retrieves its configuration file from the management card and stores the information in RAM. If the management card is not installed, or is not functioning, the line cards and channel cards can not boot.

If you remove a line or channel card and replace it with a new card of the same type, the new card automatically loads the previous card’s configuration file from the management card into RAM. To configure the new card differently, use one of the management interfaces to delete the existing configuration then configure the card as desired. If you remove a line or channel card and replace it with a new card of a different type, the card will not load the previous configuration file.

If you replace a management card, you can save the configuration files stored in the line and channel card RAM to the management card NVRAM. However, the management card configuration file containing all of the system profile information will be lost. Therefore, before replacing a management card, back up all of the configuration files from NVRAM, then restore the files onto the new management card.

**As soon as you make configuration changes, the information is saved to RAM on the management card and each of the cards affected by the configuration. The changes are lost if you unplug or reboot the management card or any of the cards affected by the configuration before you save the configuration changes to NVRAM. You must proactively save the configuration change to the management card NVRAM using the Save command in either the Web interface or the command-line interface.**

### How Hardware Profile Files are Used

A hardware profile text file (for example, amcprof.txt) is stored on each line, channel and management card. This file contains the hardware serial numbers and version numbers for the card. You can view this information using the command-line interface (see “Displaying System Inventory” on page 364) or the Web interface (see “Displaying System Inventory” on page 588). You cannot edit this information.

## MANAGEMENT TOOLS AND PROTOCOLS

Avidia systems use the following management tools and protocols, which enable you to perform management tasks such as system configuration and performance monitoring:

- SNMP (Simple Network Management Protocol)
- TFTP (Trivial File Transfer Protocol)
- FTP (File Transfer Protocol)
- Telnet (for command-line interface access)
- HTTP (HyperText Transfer Protocol - for Web interface access)
- MIBs (Management Information Bases)
- Traps

# PREPARING FOR SYSTEM CONFIGURATION AND MANAGEMENT 2

Follow these steps to prepare for initial Avidia system configuration. To configure an Avidia system that is already in service, begin with Step 3.

**1** Connect a terminal or PC running terminal emulation software to the management card craft port. See "Step 1: Connect a Terminal and Log On" on page 12.

**2** Use the Avidia command-line interface to set the management card IP address. See "Step 2: Set the Management Card IP Addresses" on page 13.

**3** Determine whether you want to use the command-line interface or the Web interface to configure and manage the system. See "Step 3: Select a Management Interface" on page 15.

**4** Determine which method you want to use to access the selected management interface. See "Step 4: Select an Access Method and Complete Setup" on page 15.

# STEP 1: CONNECT A TERMINAL AND LOG ON

The first step in an initial Avidia system configuration is to set up a local connection to the command-line interface. You access the command-line interface locally by connecting either an ASCII terminal or a PC running a terminal emulation program to the management card craft port.

**1** Connect one end of an RS-232 DB9 cable to the serial port on an ASCII terminal or PC, then connect the other end of the cable to the craft port on the front of the Avidia management card.

Refer to your system Hardware Installation Manual for help locating the management card craft port and for cabling pinouts.

**2** Power up the ASCII terminal or PC.

**3** If you are using a PC as a terminal, run a terminal emulation program such as HyperTerminal or ProComm.

See the terminal emulation program documentation for instructions.

**4** Configure your terminal or PC terminal emulation program as follows:

- baud rate: 9600 bps
- data bits: 8
- parity: none
- stop bits: 1
- flow control: none

**5** If you are using a PC, in the terminal emulation program select the COM setting of the port to which the RS-232 cable is connected (for example, COM1 or COM2).

**6** Press ENTER to initiate the terminal session and display the `username:` prompt.

**7** Type your user name, then press ENTER.

The user name **admin** is preconfigured for your use.

The `Password` prompt displays.

**8** Type your password, then press ENTER.

The password for the preconfigured *admin* user name is **`dslam`**.

The system displays a list of general commands and navigational tips, followed by the `::root=>` prompt.

# STEP 2: SET THE MANAGEMENT CARD IP ADDRESSES

You set the management card IP address, subnet mask and default gateway (if one exists) to enable communication with external networks and to enable access to the Web interface.

**You cannot use IP addresses 192.168.1.0 through 192.168.21.255 with subnet mask 255.255.255.0 as these addresses are restricted for internal Avidia system use. In addition, you cannot currently manage the Avidia system in a supernetting environment in which the IP addressing scheme contains Class C IP addresses with a Class B subnet mask.**

You configure IP addresses from the `::ip=>` prompt. From the `::root=>` prompt, type the configuration ip command then press ENTER to display the `::ip=>` prompt.

**`configuration ip`**

## Setting the System IP Address, Subnet Mask and Default Gateway

From the `::ip=>` prompt, type the addr command in the following format then press ENTER.

**addr** <ipaddr> [<netmask>] [<defaultroute>]

### Parameters

<ipaddr>

The management card IP address for the Avidia system. This address is based on the Ethernet network to which the Avidia system is attached (format *xxx.xxx.xxx.xxx).* The default management card IP address is 192.168.0.1.

[<netmask>]

The subnet mask associated with the management card IP address, if a subnet exists. This address is based on the Ethernet network to which the Avidia system is attached (format *xxx.xxx.xxx.xxx).*

[<defaultroute>]

The IP address of a router on the Ethernet network through which the Avidia system can communicate with external networks (format *xxx.xxx.xxx.xxx*).

### Examples

`::ip=>` **`addr 192.168.0.1 255.255.255.0`**

`::ip=>` **`addr 192.168.0.1`**

`::ip=>` **`addr 192.168.0.1 255.255.255.0 192.168.0.100`**

## Setting the Gateway IP Address

If a gateway exists on the network to which the Avidia system is attached and you did not configure the gateway with the IP address, type the defaultroute command in the following format then press ENTER.

**`defaultroute`** `<gwaddr>`

### Parameter

`<gwaddr>`

The IP address of a router on the Ethernet network through which the Avidia system can communicate with external networks (format *xxx.xxx.xxx.xxx*). The default gateway IP address is 192.168.0.100.

### Example

`::ip=>` **`defaultroute 192.168.0.100`**

## Displaying the System IP Addresses

To verify your configuration, from the `::ip=>` prompt, type **`show`** then press ENTER. A screen similar to the following displays.

```
::ip=> show

  AMC Card Ethernet Port IP Address:        192.168.0.1
  AMC Card Ethernet Port IP Subnet Mask:    255.255.255.0
  AMC Card Default Gateway:                 192.168.0.100
```

# STEP 3: SELECT A MANAGEMENT INTERFACE

You can perform most of the same system configuration and management functions using either the command-line interface or the Web interface. However, you can only manage user accounts using the Web interface. The command-line interface includes some on-screen help for basic commands and navigation, while the Web interface offers a more comprehensive online Help system to assist you.

The selection of an interface is based primarily on your personal preference. If you are more comfortable entering series of commands at a system prompt than you are using GUI applications, then you may want to use the command-line interface. If you are more comfortable with GUI applications, you may find the Web interface easier to use.

# STEP 4: SELECT AN ACCESS METHOD AND COMPLETE SETUP

This section describes the ways in which you can access each of the management interfaces.

## Accessing the Command-line Interface

Select one of the following methods of accessing the command-line interface then follow the instructions to complete the setup:

- Connect locally, using a terminal connected to the management card craft port (as described in "Step 1: Connect a Terminal and Log On" on page 12).
- Connect remotely, using a telnet program from any PC on the same network. To use the Microsoft Windows® 95, Windows® 98 or Windows NT® telnet utility, type the following command at a DOS prompt then press **ENTER**, where `<ipaddress>` is the Avidia management card IP address (format *xxx.xxx.xxx.xxx*).

  **`telnet`** `<ipaddress>`

  The IP protocol stack must be installed on your PC to use the telnet utility. Refer to the telnet documentation for additional instructions.

  After the telnet session has been established, press **ENTER** to display the `username:` prompt.

## Accessing the Web Interface

Using the Avidia Web interface requires:

- a PC running Windows 95, Windows 98 or Windows NT, or a Solaris workstation
- an Ethernet card installed in one of the expansion slots
- Netscape® Version 4.5 or newer (recommended) or Internet Explorer® Version 4.0 or newer
- an Ethernet cable (straight-through if connecting the computer to a hub, cross-over if connecting the computer directly to the Avidia system); see your Hardware Installation Manual for cabling pinouts.

To access the Web interface:

**1** Select one of the following methods of accessing the Web interface, then follow the instructions to complete setup:

- Connect locally, using a PC connected to the Avidia system Fast Ethernet port. Connect one end of an Ethernet cable to the PC Ethernet port and the other end of the cable to the Fast Ethernet port on the back of the Avidia chassis. Refer to your system Hardware Installation Manual to locate the Fast Ethernet port on the back of the Avidia chassis.
- Connect remotely, using a PC on the same network.

**2** If you have not already done so, plug the PC into a wall outlet then turn on the PC and monitor.

**3** Check the Ethernet card or adapter to make sure the link light is on, which confirms that the Ethernet link is up.

**4** To verify IP communications between the PC and the Avidia management card, do a ping from the PC to the IP address of the Avidia management card.

To do a ping, from a DOS prompt, type the ping command in the following format then press **ENTER**, where `<ipaddress>` is the Avidia management card IP address (format *xxx.xxx.xxx.xxx*).

```
ping <ipaddress>
```

If the ping is successful, several reply messages display on the PC monitor. If the ping is not successful, an error message displays, indicating that the request has timed out. If the ping fails, make sure the Ethernet cable is securely connected to your PC and to the Avidia system, and that you typed the correct IP address. Then try another ping.

**5** Set the monitor screen resolution to a minimum of 800 x 600 dpi (dots per inch).

Refer to your operating system documentation for instructions on adjusting the screen resolution.

# NEXT STEPS

To use the command-line interface, go to “The Avidia Command-Line Interface” on page 77.

To use the Web interface, go to “The Avidia Web Interface” on page 369.

# APPLICATIONS AND CONFIGURATION OVERVIEW 3

This chapter provides overview information about applications and technologies used in the Avidia system. Understanding the concepts discussed in this chapter will assist you during system configuration.

# ATM

The following sections provide information on setting up an ATM network.

## ATM Traffic Configuration

ATM traffic profiles are preconfigured combinations of traffic descriptors and related parameters, which define the traffic Quality of Service (QoS) contract. Traffic profiles are used to configure virtual circuits (VCCs and VPCs). During virtual circuit configuration you assign a traffic profile to each circuit. Therefore, you must configure the ATM traffic profiles prior to configuring any virtual circuits.

Adding an ATM Traffic Descriptor Profile requires you to specify a traffic type. The following table provides an explanation of the traffic types currently supported by the Avidia system.

| Traffic Type | Description |
| --- | --- |
| Unspecified Bit Rate (UBR) | UBR is a best-effort service that is best suited for LAN traffic. When traffic congestion occurs, data is dropped. The Avidia system also offers UBR service that includes a peak cell rate. |
| Constant Bit Rate (CBR) | CBR is the highest quality of service, with a guaranteed constant bandwidth. It is best suited for applications that transmit at a fixed bandwidth, such as uncompressed voice and video, and circuit emulation. When configuring CBR traffic, the specified peak cell rate applies to both tagged and non-tagged cells. This traffic type does not set the Cell Loss Priority (CLP) bit on transmitted cells that do not conform to the quality of service contract. |
| Real-time VBR (rt-VBR) | rt-VBR carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video which require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size. |
| Non-real-time VBR (nrt-VBR) | nrt-VBR carries variable bandwidth. It is well suited for data services such as frame relay over ATM which requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size. |

The following table lists traffic parameters that must be set when you configure ATM traffic profiles.

| Parameter | Description | Valid Range | Applies to Traffic Types… |
|---|---|---|---|
| PCR0+1 | The peak cell rate to apply to both tagged and non-tagged cells, in cells per second. | 150-353,207 | UBR, CBR, rt-VBR, nrt-VBR |
| SCR0+1 | The sustainable cell rate, or minimum guaranteed transmission rate, to be applied to all cells, in cells per second. | 150-353,207 | rt-VBR, nrt-VBR |
| MBS0+1 | The maximum burst size, or maximum number of cells that can be transmitted at the peak rate, in cells. | 1-65,536 | rt-VBR, nrt-VBR |
| CDVT | The maximum allowable Cell Delay Variation Tolerance, or delay between consecutive ATM cells, in cells per second. | 150-080,000 | UBR, CBR, rt-VBR, nrt-VBR |
| MaxCTD | The Maximum Cell Transfer Delay, or elapsed time between the transmission of a cell and the receipt of that cell at its destination, in microseconds. | 20-1,000 | CBR, rt-VBR, nrt-VBR |
| CLR | The maximum Cell Loss Ratio, or number of lost cells divided by the total number of transmitted cells. | 5-12 | CBR, rt-VBR, nrt-VBR |

In addition to traffic types and their related parameters, the concept of cell tagging is important to understanding ATM traffic profiles. Cell tagging means the setting of the Cell Loss Priority (CLP) bit in the ATM cell header to either 0 or 1. A CLP of 0 means that the cell cannot be dropped to accommodate traffic congestion. A CLP of 1 means that the cell can be dropped to manage traffic congestion. The Avidia system does not currently support traffic types that differentiate between tagged and non-tagged cells, nor does the system tag cells that do not conform to the quality of service contract.

# ATM Traffic Management

ATM connections are assigned a traffic profile, which specifies the Quality of Service (QoS) that will be available to the connection. Avidia traffic management features ensure that each connection is able to maintain its specified QoS.

## ATM Traffic Management Features

The following traffic management features are supported by the Avidia system:

- Connection Admission Control (CAC) allocates resources for connection requests.
- Usage Parameter Control (UPC) functions, compatible with ATM User Network Interface Specification 3.1, monitor ATM traffic and discard non-conforming cells.
- CBR, UBR, rt-VBR and nrt-VBR service types are supported.
- Queuing is managed on a per-VC and per-QoS basis.
- Statistics are collected for all established connections.

In addition, the following sections list the traffic management capabilities and limitations specific to OC3 and ADSL cards.

**OC3 Card.** The following are traffic management features for the OC3 card:

- Each card supports up to 4096 total connections (VPs and VCs combined).
- Queues are created by CAC for each individual VP, with a maximum of 992 connections per VP.

**ADSL Card.** The following are traffic management features for the ADSL card:

- Each card supports up to 512 total connections (VPs and VCs combined).
- Queues are created by CAC for each individual VP, with a maximum of 256 connections per VP.

**SDSL Cell Card.** The following are traffic management features for the SDSL cell-based card:

- Each card supports up to 512 total connections (VPs and VCs combined).
- Queues are created by CAC for each individual VP, with a maximum of 256 connections per VP.

### Establishing a Connection

When a new VC or VP is created, CAC compares the requested QoS with resources available for both upstream and downstream traffic. If the requested QoS is available for both directions, the connection is established.

If the requested QoS is not available, CAC denies the connection request and generates an error message.

When CAC establishes a connection, it also creates queues for the connection. These queues operate on a per-VC and per-QoS basis, independently maintaining the guaranteed QoS for each established connection.

When setting up a connection, policing functions for the connection can be enabled or disabled. If enabled, policing allows UPC functions to monitor traffic flow and discard non-conforming cells.

## ATM Device Addresses

Two types of addresses are used to identify ATM devices:

- ATM addresses are public addresses assigned by a regulatory body.
- Location IDs are private addresses that identify ATM devices within a network.

### ATM Addresses

Each ATM address is unique to the individual device to which it is assigned, which provides access to all other connected ATM devices. All ATM addresses are 20 bytes long, and are composed of two parts:

- The prefix contains network and other information that identifies the location of the device. All devices on a chassis use the same prefix. The prefix can be any length, up to 19 bytes. The length may be defined by the regulatory body that assigned the address. For example, all E.164 addresses have an 8-byte prefix.
- The system identifier identifies the specific device on the network. Its length is the difference between 20 bytes and the prefix length.

### Location IDs

Location IDs are assigned by an ISP or other local body. They are unique within a location ATM network but are not necessarily unique globally. Location IDs can be any length up to 20 bytes.

When configuring OAM loopbacks you must enter a location ID. It is recommended that you use system's network prefix followed by 0s for the Location ID.

## ATM Virtual Circuits

ATM virtual circuits are logical connections in the ATM network over which ATM cells are transmitted between two points. Permanent Virtual Circuits (PVCs), supported by Avidia systems, comprise a Virtual Path Connection (VPC) and, frequently, multiple Virtual Channel Connections (VCCs) within the VPC. The VPCs and VCCs are mapped to a predefined static route that is always in place and is always available.

The Avidia system functions as a VPC or VCC cross-connect switch, utilizing cross-connect VPCs and VCCs to carry data between defined points within the Avidia chassis, such as between a channel card and a line card. VPCs and VCCs also carry data from subscriber modems to Avidia channel cards, and from Avidia line cards to other destinations in the ATM backbone network.

VPC configuration requires specifying a Virtual Path Identifier (VPI). For VPCs, the system only translates the VPI value and does not check or change any configured Virtual Channel Identifier (VCI) value. VCC configuration requires specifying a VPI and a VCI. VPI and VCI combinations must be unique only on the same user port, as the circuit is remapped to a different VPI and VCI on the network interface. This enables different subscribers to use the same VPI and VCI combinations without creating conflict in the network.

The valid VPI and VCI range depends on the type of cards used in the virtual circuit. Use the following tables to determine valid values.

| Card | PVC Configuration | | | |
|---|---|---|---|---|
| | VPI Range | No. of VPIs per port that can be mapped to PVCs | VCI Range | Maximum no. of connections that can be mapped to each port [a] |
| OC3 | 0-255 | 16 | 32-1023 | 4094 |
| DS3 | 0-255 | 16 | 32-1023 | 4094 |
| AMC | 0 | 1 | 1024-4095 | 96 |
| DSX-1/T1 user or network interface (ATM) | 0-255 | 3 | 32-1023 | 510 |
| Cell-based ADSL channel card (ATM) | 0-255 | 4 | 32-253 | 40 |
| Frame-based SDSL | 0 | 1 | 1024-4095 | 3072 |
| Cell-based SDSL (ATM) | 0-127 | 4 | 32-127 | 40 |
| Frame-based IDSL | 0 | 1 | 1024-4095 | 3072 |

(a) The system supports a maximum of 8188 total connections.

| | VPC Configuration | |
|---|---|---|
| **Card** | **No. of VPIs per port** | **VPI Range** |
| OC3 and DS3 | 4,096 minus the number of VPIs used for cross-connect PVCs | any number between 0-4095 not used for PVCs |
| DSX-/T1 | 256 minus the number of VPIs used for cross-connect PVCs. | any number between 0-255 not used for PVCs |
| Cell-based ADSL | 256 minus the number of VPIs used for cross-connect PVCs | any number between 0-255 not used for PVCs |
| Cell-based SDSL | 128 minus the number of VPIs used for cross-connect PVCs | any number between 0-127 not used for PVCs |

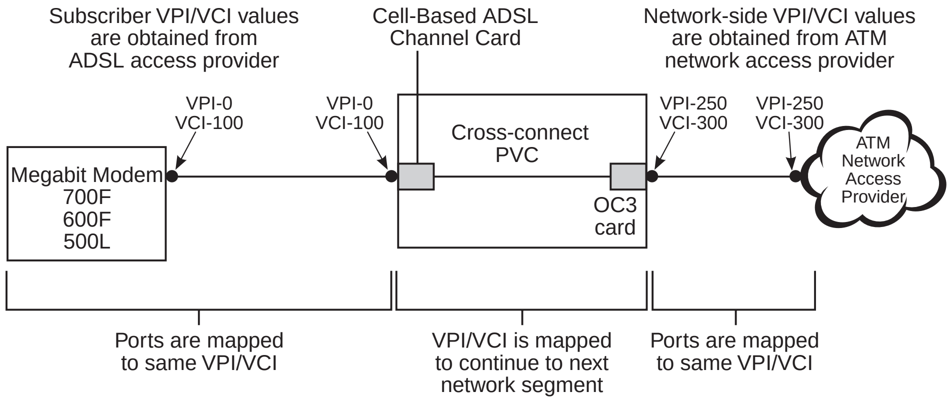
Before configuring ATM virtual circuits, complete the following:

❒ Set up xDSL service for the ports to be configured.

❒ Set up ATM traffic profiles for both upstream and downstream traffic.

❒ Map the ATM virtual circuits to be configured, including the VPIs and VCIs to be assigned, verifying the values with the preceding tables.

The following illustration shows an example of a configured PVC, including the specific VPI and VCI values associated with each segment of the connection.




ATM PVCs can also be set up to run bridging, routing or brouting sessions. See "Configuring Bridging and Routing Sessions" on page 228 (command-line interface) or "Configuring Bridging and Routing Sessions" on page 486 (Web interface) for information about setting up and running bridging, routing, and brouting sessions over ATM PVCs.

# Frame Relay Transmission

Frame relay interworking allows frames to be transported by an ATM network to an ATM device or another frame relay device. Use frame relay with the IDSL frame-based card that attaches to modems using frame relay protocol. There are two standards for interworking:

- FRF.5 defines how frames are encapsulated so that they can be carried by the ATM network to another frame device.
- FRF.8 defines how frames are translated between ATM and frame devices.

To set up frame relay services:

- Configure service for each IDSL frame card port (includes selecting the IDSL card transmit clock source, and the IDSL line profile and IDSL alarm profile for each port).
- Configure the frame relay link for each port, which involves setting the LMI (Local Management Interface) parameters. The LMI type defines the method of exchanging status information between the customer device and the network. The available LMI types are LMI Rev-1, ITU 0.933 Annex-A, ANSI T1 617 Annex-D, and no LMI support.

- Configure the FRF.5 or FRF.8 circuit for each port. This includes creating the cross connect through the Avidia system (from the line card to the IDSL frame card), and configuring cell loss priority, congestion control, and the traffic type. The available traffic types are:
  - ubr (Unspecified Bit Rate)—This is a best-effort class of traffic that is best suited for a LAN. When network congestion occurs, the data is stored in a buffer until it can be sent.
  - cbr (Constant Bit Rate)—This traffic class carries a guaranteed constant bandwidth. It is best suited for applications that require fixed bandwidth, such as uncompressed voice, video, and circuit emulation. CBR is a Quality of Service class defined by the ATM Forum for ATM network.
  - nrt-vbr (non-real-time Variable Bit Rate)—This traffic class carries variable bandwidth. It is well suited for data services such as frame relay over ATM which requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.
  - rt-vbr (real-time Variable Bit Rate)—This traffic class carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video which require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.
- Configure a session to set the service and encapsulation types for the cross connect. The available encapsulation types depend upon the service type you select and both must match the modem encapsulation type. See “Configuring Bridging and Routing Sessions” on page 228 (command-line interface) or “Configuring Bridging and Routing Sessions” on page 486 (Web interface) for information.

# SONET

The Synchronous Optical Network (SONET) is the transport standard for transmitting data over fiber-optic cable. It supports data rates in the gigabit range, optical interfaces, network management, and diagnostic testing methods.

SONET comprises four layers, as described in the following table:

| Layer | Description |
|---|---|
| Medium | The physical layer, in which electrical and optical signals are transported across SONET cable. This is the lowest SONET layer. |
| Section | Governs communication between SONET network elements, such as regenerators. This layer handles framing, scrambling, and error monitoring. |
| Line | Establishes communication between SONET line terminating equipment where SONET signals are multiplexed or demultiplexed. This layer handles data transmission through synchronization, multiplexing, and other data transport functions. |
| Path | Terminates point-to-point communications. This layer handles transport of services through the entire network. This is the highest SONET layer. |

# REDUNDANCY

Redundancy is a feature of the Avidia system. Redundancy includes:

- dual homing, which provides redundancy at a VPC or VCC level (dual homing also provides static load sharing) as described on page 29
- card redundancy, where a primary line card can switch to a secondary line card if the primary card were to fail as described on page 32
- Automatic Protection Switching (APS) for the OC3 line card with dual-PHY connectors, where the primary physical port switches to the secondary physical port if the primary port were to fail as described on page 33

## Dual Homing

Through dual homing, a second network interface (DS1, DS3 or OC3 line card) is used in the Avidia system and provides support that includes:

- backup or redundant PVCs with the same destination
- static load sharing where traffic is directed separately to a primary and to a secondary line card, increasing the amount of traffic that you can send through the system (see page 30)

See page 31 for information about applying Quality of Service to traffic that is assigned to dual homing configurations.

When setting up a system for dual homing, one line card is a primary line card and the second line card is a secondary or backup line card. In an Avidia 8000 system, you can install the line cards into slot 11 and slot 12. The two line card slots are essentially symmetric. At any point, only one of the two line cards will provide cell bus clocking. Configure ATM VPCs and VCCs to the line card that you choose as primary and configure the backup VPCs and VCCs to the second line card.

In an Avidia 3000 system, you can install the line cards into slot 2 and slot 3. The line card in slot 2 provides cell bus clocking and must be in the slot when an Avidia 3000 system is initialized (booted). When there is a failure of the line card in slot two, cell bus clocking switches to slot 1. Configure ATM VPCs and VCCs to the line card that you choose as primary and configure the backup VPCs and VCCs to the second line card.

Redundancy is another feature of Avidia systems that uses two line cards. Redundancy provides backup at a card level where dual homing provides backup at a PVC level (VPCs and VCCs). See page 32 for more information about redundancy. You can implement both redundancy and dual homing concurrently in an Avidia system. You must, however, carefully plan traffic management and QoS to efficiently run the network. See page 30 for information about traffic management.

## Backup ATM PVCs

ATM service requires the configuration of ATM PVCs which comprise VPCs and VCCs. VPCs and VCCs are the logical connections over which ATM cells are transmitted; these are referred to as the primary VPCs and VCCs. You can create backup VPCs and VCCs to which the system can automatically switch in the event that primary VPCs or VCCs fail. These are referred to as secondary VPCs and VCCs. The secondary VPCs and VCCs are configured to the second (redundant) line card in the Avidia system. When setting up the backup VPCs or VCC, you can use the same VPI and VCI values as the primary VPC or VCC, or you can use a different VPI and VCI combination. Use a VPI value is required for both a VPC and a VCC; a VCI value is required for a VCC only.

After the system automatically switches to a backup VPC or VCC, you must manually return service to the primary VPC or VCC.

## Static Load Sharing

The dual homing feature of static load sharing allows you to increase the amount of traffic that you can send through the system by allowing you to direct traffic to two separate line cards. The uplink for both line cards (DS1, DS3 and OC3) is from the same ATM source, but the information that is transmitted may be directed either to the same or to different destination devices. The line cards can be of the same type (both OC3, for example) or they can be of different types (an OC3 and a DS3, for example).

Through either the command-line or Web interfaces, you can direct some Avidia system ATM cross-connections to one of the line cards and then direct other ATM cross-connections to the second line card. If you also implement card-level redundancy and backup or secondary VCCs and VPCs, you need to carefully balance loads and manage traffic and QoS to efficiently use the network and the bandwidth available for each line card.

If one line card fails, the second line card takes over the functionality of the failed line card, and re-establishes all the connections. This can result in too heavy a traffic load on the second line card. To handle this, you can configure the recovery priority by traffic type (for example, CBR first, rt-VBR second).

## Traffic Management for Dual Homing

When implementing dual homing, you can create backup PVCs and configure static load sharing to both line cards in an Avidia system. Account for these variables when setting up a system:

- the number of VPCs and VCCs that can be switched from a primary to a second line card
- the number of VPCs and VCCs mapped full time to each line card
- the traffic contract and quality of service (QOS) you apply to each VPC and VCC
- the policing, through the Usage Parameter Control (UPC), that applies to the connection

The traffic contract and policing you select is dependent on the service you provide. The traffic contract and policing selection should maximize the network throughput and minimize end-to-end delays, thus efficiently utilizing the network. To set up your system:

- Create ATM profiles for the service you will supply (upstream and downstream rates and the QoS must be supported end-to-end). See page 20 for the traffic types that are available.
- Configure service as described in the sections for command-line or Web interface.
- Set up UPC policing. The policing function monitors and regulates traffic flow at the interface to ensure the traffic conforms to the configured traffic contract (see "ATM Traffic Configuration" on page 20 for information about the traffic contract). Policing protects the network from intentional or unintentional changes in the traffic contract that could affect other connections. If you enable policing and traffic does not conform, it is deleted. Policing validates parameters such as VPI/VCI values, traffic rates conforming to contract. Policing can be enabled per one of the following:
  - ATM port
  - VPC
  - VCC

When implementing dual homing and redundancy, a failure of the primary line card switches traffic to the secondary line card. This can result in too heavy a traffic load on the second line card. To handle this, you can configure the recovery priority by traffic type (for example, CBR first, rt-VBR second). If you do not configure recovery priorities, the connections are recovered sequentially until no further resources are available. After that point, the remaining connections are dropped.

# Line Card Redundancy

The Avidia system line cards provide two types of ATM connection redundancy:

- connection redundancy between the line card and the destination ATM end system
- line card redundancy, should a line card fail

## Connection Redundancy Between Line Card and ATM End System

When a connection goes down between the line card and the destination ATM end system, the line card detects the failure and attempts to re-establish the connection by automatically retrying or re-routing it, using signaling. This requires that the line card and the destination ATM end system both support signaling.

To enable connection redundancy between the line card and the destination ATM end system, you configure an end-to-end connection using SPVCs. SPVCs comprise:

- a cross-connect (VCC or VPC) from a cell-based channel card to a line card
- an SVC from the Avidia line card across the ATM network to an ATM end system.

SVCs require the following addressing scheme:

- Each Avidia system is assigned an ATM network prefix that is within the public UNI to which the system is attached. The ATM service provider assigns this prefix. Each Avidia system should be assigned a separate prefix to reduce routing time, however, if multiple clustered systems are assigned the same prefix, each system can be assigned a node identifier to distinguish it from the other systems in the cluster. See page 23 for more information about ATM addresses.
- Each CPE is assigned an ATM end system address based on the network prefix of the Avidia system to which it is attached. The CPE address consists of the slot, port, VPI and VCI values.

## Line Card Redundancy

If a line card fails, and you have a second line card installed, the second line card detects the failure, takes over all of the functionality of the failed line card, and re-establishes all of the connections. This requires two ATM line cards to be installed in the Avidia system, and at least two uplinks from the Avidia system to the ATM network.

Line card redundancy requires configuring static routes in the ATM Routing Table. When a line card fails, the system uses the ATM Routing Table information to re-route SPVCs to a specified slot and port on the secondary line card, based on the destination ATM address.

### Managing Traffic for Redundancy

You can configure the Avidia system for static load sharing, using two installed line cards. However, if one line card fails, the second line card takes over the functionality of the failed line card, and re-establishes all the connections. This can result in too heavy a traffic load on the second line card. To handle this, you can configure the recovery priority by traffic type (for example, CBR first, rt-VBR second). If you do not configure recovery priorities, the connections are recovered sequentially until no further resources are available. After that point, the remaining connections are dropped. See “Static Load Sharing” on page 30 for more information about static load sharing and traffic management.

When an initial call request is unsuccessful, or an existing connection fails, and the call has been retried the maximum configured number of times, the call request is re-routed using the other line card.

## Automatic Protection Switching

OC3 line cards have two physical SONET interfaces, each with a transmit and receive port. Under normal operation, all traffic is carried through the first interface; the second is not used. Automatic Protection Switching (APS) uses the second interface to provide a backup to the first.

Avidia uses 1+1 unidirectional APS. In this version of APS, the primary interface is defined as the working channel. The second interface is defined as the protection channel. Transmitted data is sent over both channels. Data is normally received through the working channel. However, if the working channel fails, received data automatically switches to the protection channel.

By default, APS is disabled on Avidia systems. You must enable APS for automatic switching to occur. See “Configuring APS” on page 158 (command-line interface) or “Configuring APS” on page 430 (Web interface) to enable APS.

## APS Modes

What happens after traffic has switched to the protection channel depends on the APS configuration. There are three modes:

- Non-Revertive mode prevents traffic from automatically switching back to the working channel when it becomes operational. In this mode, traffic remains on the protection channel until it is manually switched back to the working channel or the card is reset. This is the default mode.
- Non-Revertive Auto-Switch mode automatically switches traffic back to the working channel if the protection channel fails and the working channel failure is cleared.
- Revertive mode automatically switches traffic back to the working channel when the working channel failure has been cleared for a user-specified amount of time, from 5 to 12 minutes.

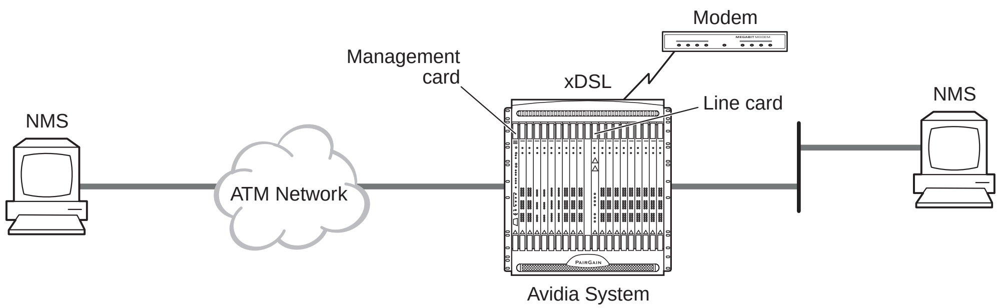
## APS Commands

Manual commands provide further control over APS operation. Some commands temporarily disable automatic switching. These commands must be manually cleared to return to normal APS operation.

- **Lockout Protection** disables automatic switching.
- **Force to Protection** forces traffic to the protection channel and disables automatic switching.
- **Force to Working** forces traffic to the working channel and disables automatic switching.
- **To Working if Ready** forces traffic to the working channel, if there are no conditions (such as a working channel failure) that prevent the switch. This command does not disable automatic switching.

# INBAND MANAGEMENT

Inband management offers the ability to manage Avidia networks, including attached modems or subtended systems, from a Network Management System (NMS) or Element Management System (EMS), such as StarGazer. This management occurs over the same ATM network that is used for data transmission, but on a ATM PVC that you set up specifically for management. The NMS/EMS must be running an SNMP utility. See the figure below for an example configuration.




An IP address is associated with either a physical port or a logical port (ifIndex) that is part of the Avidia system, including subtended chassis. Through this IP address, the NMS/EMS can inband manage through an SNMP request.

Out-of-band management of both Avidia systems and modems is also available through a connection of an NMS/EMS to the Ethernet port on the Avidia Management card (AMC). SNMP requests, which are UDP/IP, are handled in the same manner by the AMC whether received inband through the ATM network or out-of-band through the Ethernet port.

See the following sections for information on how inband SNMP requests are handled for:

- Avidia systems
- modems
- subtended systems

## Inband to Avidia

The Avidia system automatically creates two dedicated management PVCs to Megabit Modems 700F, 600F, and 500L. SNMP requests are sent to the Avidia system from an NMS/EMS. When the Avidia system receives the SNMP request, it either responds or forwards depending on the value of the community string (see the "Inband to Modems" section below). See "Determining IP Addressing and Subnet Masks" on page 42 for information on setting up a system for inband management.

## Inband to Modems

With the inband management of modems, SNMP requests are made from the NMS/EMS over the xDSL port connection to the modem. The Avidia system acts as a proxy agent for the SNMP request to the modem. The SNMP request from the NMS/EMS to the Avidia system must include:

- the IP address for the Avidia system
- an Object ID (OID) for the modem (rather than the OID for the Avidia system)
- the slot and port of the channel card where the modem is attached appended to the community string, (for example, **public:4.2**)

  The modified community string enables the Avidia system to recognize that the request is destined for a specific modem, and to forward the request to the appropriate channel card port.

For modems, inband management provides the ability to:

- configure or change WAN, LAN, and system parameters
- collect statistics (status and performance history from both the LAN and WAN interfaces)
- troubleshoot

See "Bridging and Routing" on page 37 for information on how to set up access to modems for inband management.

### Inband for Subtending

Multiple Avidia systems can be implemented, viewed, and managed as if they were one system. This type of management is known as subtending. One system is connected at the edge of the network and is the subtending system. The other systems are managed by the subtending system. See “Subtending Multiple Systems” on page 45.

Through inband management, the systems can be viewed and managed as if they were one. The inband management of a subtended system from an NMS/EMS occurs by indicating the IP address and OID in the SNMP request for the destination subtended system.

## Bridging and Routing

The Avidia system provides the ability to bridge and/or route Ethernet traffic over ATM PVCs. Through this feature, users can implement applications such as:

- LAN extensions for enterprise networks
- campus applications
- accessing any IP device that is on the same Ethernet segment of an Avidia system

Over each ATM PVC, you can configure a session that is bridged, routed, or bridged and routed (brouted). The following paragraphs provide information about bridging and routing, then describe how to set up bridging/routing sessions for an Avidia system.

## Bridging and Spanning Tree Protocol

You can configure bridging sessions that forward Ethernet data based on MAC addresses. A bridge moves information across a network from a source to a destination at the data link layer (of an OSI reference model). The information is sent to a physical address on the Ethernet interface known as a Media Access Control (MAC) address, which is preassigned by a manufacturer. The MAC forwarding table for an Avidia AMC supports 4096 entries. You can set an aging time interval for the bridging addresses found in the MAC forwarding table. If table entries are not relearned within the specified time frame (interval), they are deleted.

When bridging, the Avidia system supports the IEEE version 802.1d Spanning Tree Protocol (STP). STP eliminates loops in a topology by partitioning out redundant links in a connection between segments. This ensures that there is only one path, or link, between any two points in a bridging connection. If an active link goes down, Spanning Tree re-enables partitioned links to create a new loop-free topology, if possible.

Bridging and STP are system-wide functions. When you enable bridging, it is available to any session set up over a ATM PVC in the system. You can either enable or disable STP when bridging is enabled. Bridging must be enabled, however, to use STP.

## Routing

Routing sessions route Ethernet-encapsulated IP datagrams based on IP addresses. A routing session moves information across a network from a source to a destination at the network layer (of an OSI reference model). IP routers make forward or filter decisions based on the network-layer IP address instead of the MAC hardware address.

**Routing Protocols.** Use Routing Information Protocol (RIP) to automatically identify the route from the origin of the session to the destination. You can specify the version of RIP that provides routers information to update their routing tables automatically (for example, information on how many hops between destinations). The version of RIP you select for the session must match the version supported by the entire connection:

- RIP Version 1 supports broadcast
- RIP Version1 Compatible is RIP Version 2 which supports broadcast
- RIP Version 2 supports multicast, Plain Text Authentication, and Variable Length Subnet Masking (VLSM)

**Static Routing.** You can configure a session with a statically entered route. Through this function, the connection provides broadcast filtering and prevents eavesdropping by specifying destination gateways. With static IP routing, you can access only specific remote IP subnets or hosts.

When setting parameters for an external router, configure a Static Route entry in any of the external routers that may have been specified as a Default Router or as a Gateway. This implementation prevents other parties from discovering routes through eavesdropping. The format of this entry varies among the various router vendors, but is typically in the form where:

- destination is the remote target IP Subnet or host address, with the applicable subnet mask added
- gateway is the IP address of a device(s) that connects networks
- hop is the number of routers that separate the source and its destination

**Global Routing Settings.** You can enable a system-wide time-to-live setting for IP datagrams that are generated within the Avidia system and do not already have a time-to-live value in the header. The setting specifies a maximum number of hops a packet can take before it reaches the destination. You can also enable an IP forwarding field for the system.

## Encapsulation for Bridging, Routing, or Brouting

The two encapsulation types available for bridging, routing, or brouting sessions in the Avidia system are LLC/SNAP and VC-MUX. Most users select LLC, which allows multiple protocols to run over the session ATM PVC. An encapsulation header identifies the types of protocol being carried in the transmission. The LLC/SNAP encapsulation types supported and identified by the header are:

- LLC/SNAP 802.3 which is used for traffic that comes from a bridging function
- LLC/SNAP IP which is used for traffic that comes from a routing function

VC-MUX allows only one protocol to run over the session ATM PVC. The type of protocol must be negotiated prior to the transmission. VC-MUX encapsulation types supported are:

- VC-MUX_Bridged for bridging sessions (connections between an SDSL frame session and an AMC must use VC-MUX_Bridged)
- VC-MUX_Routed for routing sessions

VC-MUX_Bridged has a header, while VC-MUX_Routed has a null header.

You can set up ATM PVCs between cards in the Avidia system and to modems and run sessions over them. The maximum number of ATM PVCs that you can terminate on the AMC for bridging, routing, or brouting sessions is 96. See the table on page 24 for the maximum number of ATM PVCs that you can terminate on other Avidia cards. The following table summarizes the service types and encapsulation that you can use for the various connections within the Avidia system. These connections may ultimately terminate on modems or other devices attached to an Avidia system.

| Connection between: | Service Type | Encapsulation |
|---|---|---|
| OC3 line card and an SDSL frame channel card | LAN tunneling | VC-MUX _Bridging |
| OC3 line card and the AMC | Bridging, routing, brouting | • LLC/SNAP (router or brouter)<br>• VC-MUX_Bridging (bridging)<br>• VC-MUX_Routing (routing) |
| ADSL channel card and the AMC | Bridging, routing, brouting | • LLC/SNAP (router or brouter)<br>• VC-MUX_Bridging (bridging)<br>• VC-MUX_Routing (routing) |
| SDSL frame channel card and the AMC | Bridging only | VC-MUX_Bridging only |

## Implementing Bridging/Routing/Brouting Sessions

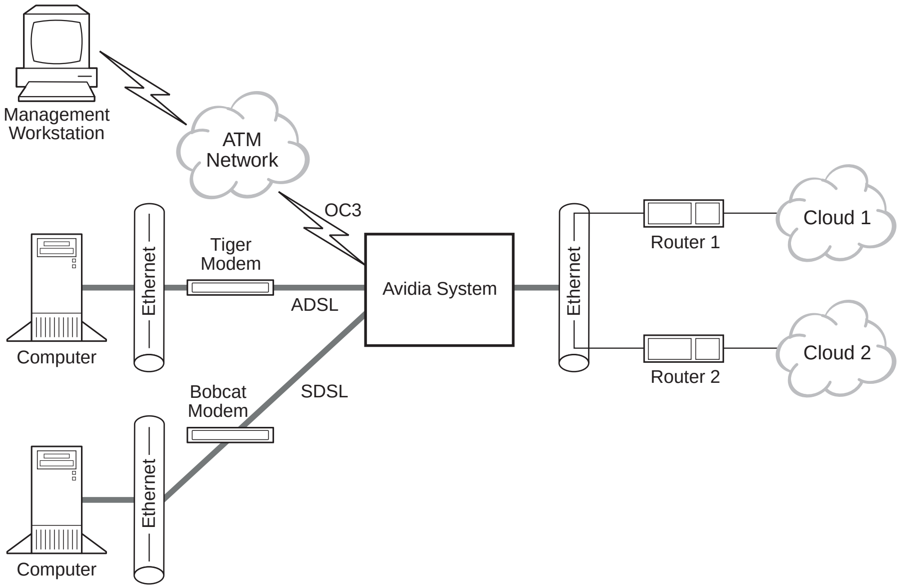
Use the Avidia command-line interface or the Web interface to set up bridge, router, or brouter sessions. The following lists procedures you must accomplish to configure sessions. You will find the tasks for these procedures in either the command-line interface or Web interface sections of this manual:

- When configuring routing sessions, set up the router group which provides an IP address and subnet mask for the logical port you will set up for the session.
- Add a bridge, router, or brouter session as indicated below:

| For this type of session: | Do these procedures: |
|---|---|
| Bridge | Set:<br>• STP priority (when STP is enabled)<br>• STP path cost (when STP is enabled)<br>• MAC address filtering, when applicable |
| Router | • Select RIP or select static route<br>• Assign router group<br>• Configure IP routing table (information used by AMC to route data) |
| Brouter | For bridging set:<br>• STP priority (when STP is enabled)<br>• STP path cost (when STP is enabled)<br>• MAC address filtering, when applicable<br>For routing:<br>• select RIP<br>• assign router group<br>• configure IP routing table (information used by AMC to route data)<br>Then set:<br>• IP ARP, when applicable |

- When an ADSL modem (CPE) is part of connection, set up applicable bridging, routing, or brouting for the modem.

The following figure shows an example campus server configuration.

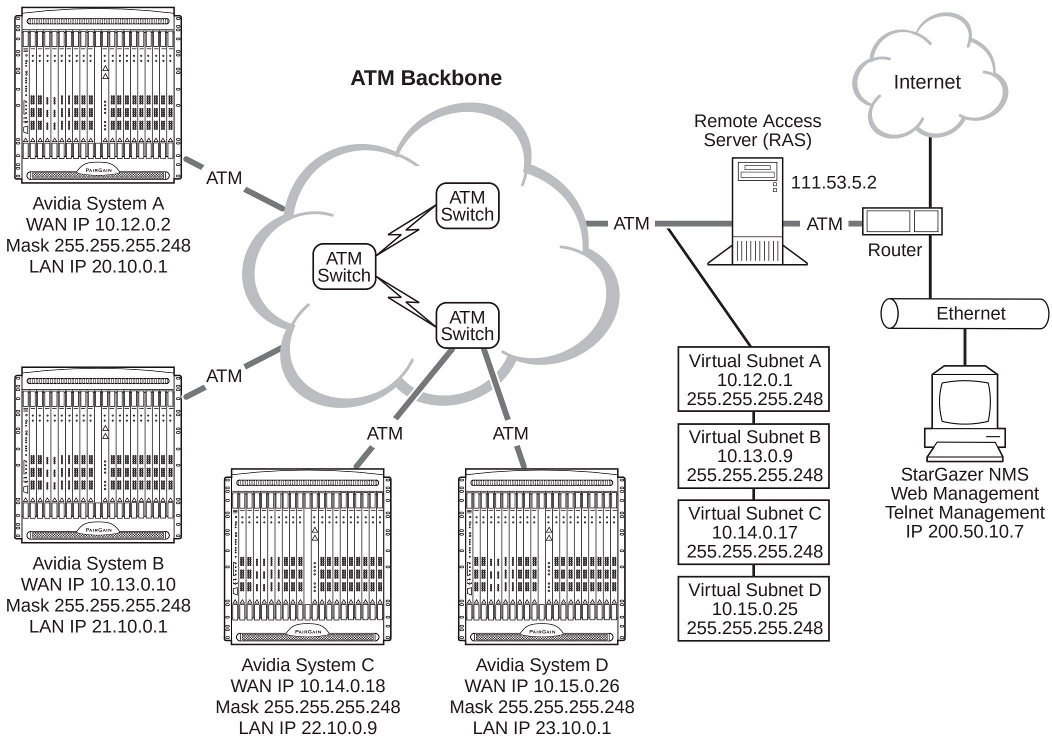



## Determining IP Addressing and Subnet Masks

When you set up enterprise or campus server applications, use this general criteria for assigning IP addresses.

- The WAN IP address for the modem should be on the same subnet as the Avidia channel card port to which the modem attaches.
- When a LAN is set up on a modem (CPE), the LAN IP addresses should be on the same subnet as the LAN port of the modem.
- When a LAN or NMS/EMS is set up on the Ethernet port of the AMC, the IP address for the LAN or NMS/EMS should be on the same subnet as the AMC Ethernet port.

When you set up a remote system for inband management, you must specify the destination IP address and subnet mask as well as the gateways and hops to reach the destination. Use the figure on page 43 as an example of how to set up this connection. This example shows a small business application using a Remote Access Server (RAS). Applications for a larger business may use other devices in the network.




- Each Avidia WAN IP on its own subnet
- Avidia LAN IP on different subnet than WAN IP
- Remote Access Server (RAS) has a separate Virtual subnet on ATM side for each Avidia in-band management connection
- Separate End-to-end PVC built from each Virtual subnet in RAS to each Avidia
- Internet shown only for subscriber traffic

# Downloading Files to a Modem

This version enables file download from the Avidia system to remotely connected ADSL and SDSL frame modems. This feature is supported for modems meeting the following criteria:

| Modem type | Megabit Modem models supported | Downloadable files | Software versions supported |
|---|---|---|---|
| ADSL | 700F, 600F, 500L | image<br>configuration | 2.7 and above |
| SDSL frame | 300S | image | 2.0 and above |

To download modem files to remotely connected ADSL and SDSL frame modems:

- You copy the modem files onto a TFTP server to which the Avidia system has access.
- From the Avidia system, you download the files from the TFTP server onto the SDSL frame or ADSL cards.
- From the Avidia system, you download the file from the SDSL or ADSL card to the remote modems.
- Reboot the ADSL modem (SDSL frame modems reboot automatically) to activate the downloaded files by doing one of the following:
  - through inband management, send an SNMP request to reboot
  - have the customer reboot the ADSL modems

# Transparent LAN Service

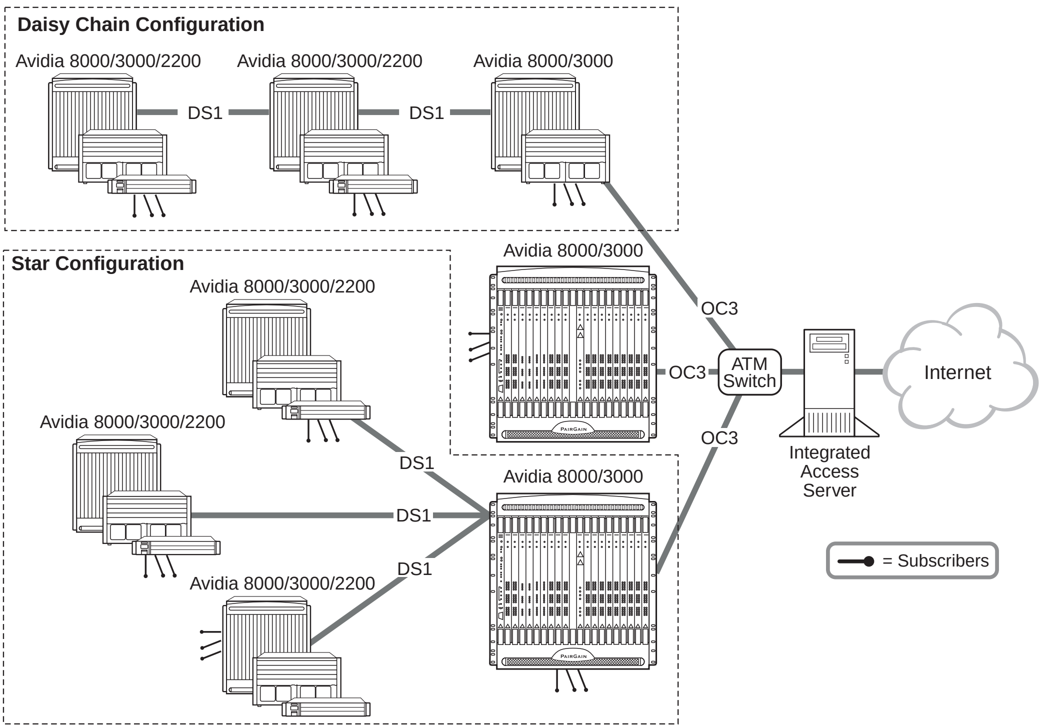
Transparent LAN service functions like a point-to-point connection between LANs, using the higher-level protocols. Transparent LAN service encapsulates Ethernet traffic, converts it into ATM cells, then sends it across the ATM backbone to the target destination where the data is converted back into Ethernet packets. Ethernet traffic carried over a Transparent LAN service is not modified in any way, nor is it looked at by any of the ATM devices during transmission. Therefore, it is a very secure way to transmit data using multiple protocols (IP, IPX) across the WAN.

# SUBTENDING MULTIPLE SYSTEMS

Multiple systems can be implemented, viewed, and managed as if they were one system. This type of management is known as subtending. To subtend, connect and configure Avidia systems in one of two ways: a star configuration or a daisy chain configuration.

In either implementation, multiple systems connect to one system that aggregates the transmission of all the attached systems and provides one network uplink. The aggregating system is known as the *subtending* or *source* system and each of the systems connected to it are known as the *subtended* or *destination* systems.

See the figure below for a representation of both daisy chained and star configured systems. In the figure, the subtending systems in each configuration aggregate the transmissions of the subtended systems and provide a network uplink via OC3 to the ATM Switch.



In the deployment of xDSL services, subtending helps the service provider satisfy the customer's demand for bandwidth against the WAN trunk capacities. Subtending helps to expand the availability of service more cost effectively and expand to the more remote subscribers. Subtending services, offered by Avidia, are complemented by its ATM features and provide benefits such as:

- optimizing the use of the more expensive WAN transmissions, such as DS1, DS3, and OC3, by using only as much of the bandwidth as required
- incrementally adding bandwidth without changing the hardware (for example, 8xDS1 and 8xDSX-1 cards have eight separately configurable DS1 ports)
- using an Avidia system at the edge of the network (aggregates and provides uplink) rather than using a third party switch
- concentrating data efficiently
- organizing the network through the use of VPCs and VCCs
- selecting ATM QoS classes to effectively groom traffic within the network

Set up subtending using AV8000, AV3000 and AV2200 systems. AV8000 and AV3000 systems can both subtend and be subtended while the AV2200 is typically a subtended system and does not subtend other systems. Then, within these Avidia systems, use the cards listed in the following table to set up the appropriate subtending or subtended interfaces. To subtend, connect a channel-side interface of the subtending system to the line-side interface of the subtended system. A line-side interface must be in slot 11 or 12 of an AV8000, in slot 2 or 3 of an AV3000 or in slot 1 of an AV2200 to provide a cell bus clock and cell bus arbiter clock for the Avidia system. The line-side interface also provides either the network uplink interface to the subtending system or the line interface from the subtended to the subtending system.

| Interface card | Use interface cards in these Avidia systems: | | | Maximum number for subtending |
|---|---|---|---|---|
| | **AV8000** | **AV3000** | **AV2200** | |
| OC3 (AV311, AV312, AV313) | • Slot 11 or 12 as a line interface<br>• Slots 2 - 10, 11 or 12 (whichever was not the line interface), or 13 - 21 as a channel interface | • Slot 2 as a line interface<br>• Slots 3 - 5 as a channel interface | N/A | 3 |
| DS3 (AV323) | • Slot 11 or 12 as a line interface<br>• Slot 11 or 12 (whichever was not the line interface) as a channel interface | • Slot 2 as a line interface<br>• Slot 3 as a channel interface | N/A | 1 |
| DS1 (AV351) | • Slots 2 - 10 or 13 - 21 as a channel interface only | • Slot 2 as a line interface<br>• Slots 3 - 5 as a channel interface | N/A | 18 (AV8000)<br>3 (AV3000) |
| DSX-1 (AV353) | • Slot 11 or 12 as a line interface<br>• Slot 11 or 12 (whichever was not the line interface) as a channel interface | • Slot 2 as a line interface<br>• Slot 3 as a channel interface | N/A | 1 |
| DS1 line/management card (AV351) | • N/A | • N/A | • Slot 1 as a line interface | 1 |

**It is important to note that you cannot use the same card to subtend and be subtended. For example, a DS1 card has eight ports; you cannot use one port to subtend another port on the same card.**

The implementation of subtending is described in these sections:

- "Star Management" on page 48
- "Daisy Chain Management" on page 52

Each section provides both the features of and the limitations for implementing each subtending approach. You can also combine the star and daisy chain approaches to effectively implement subtending.

# Star Management

In a star configuration, you can attach up to three systems (subtended systems) directly to the one system that connects on the edge of the network (subtending system). The subtending system aggregates the traffic from the subtended systems, switches all the traffic (its own and that of the subtended systems), and provides the network uplink. Features of this management approach include:

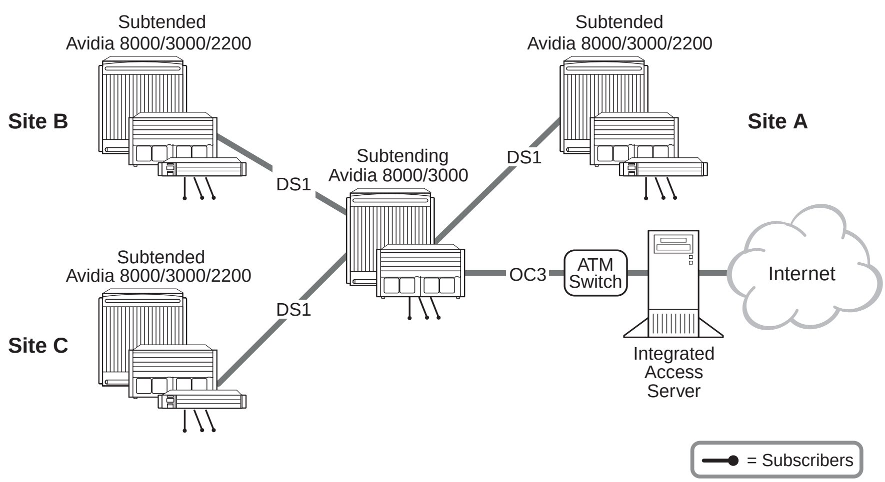
- shorter segment costs rather than the longer length cost of a daisy chain
- more cost effective than running fiber optic cable to new areas or to areas with a small number of subscribers

Each system, whether subtending or subtended, can connect to and manage subscriber traffic (modems).

“Star Physical Implementation” on page 48 shows how to set up a star configuration using Avidia systems. “Star Configuration” on page 50 shows how to configure the system to implement the appropriate connections.

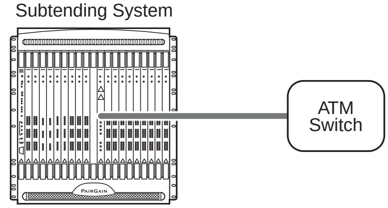
## Star Physical Implementation

The relationship of subtending in a star configuration is shown in the following figure. The example shows an OC3 interface as the network uplink for the entire subtended system. An AV8000 or AV3000 is the subtending system. Three chassis are subtended and are at three separate physical locations (sites). The subtending connection is through a DS1 link.



The following sections describe how to select cards for the various subtending connections. The figures use the sample system shown above as an example.

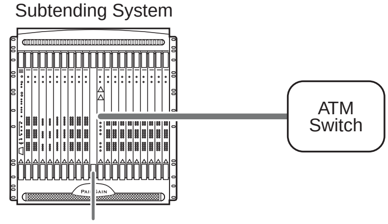
**Select the uplink card.** Install one card for the network uplink, such as the ATM switch shown to the right, in the *subtending* system. The card must reside in slot 11 or 12 for an AV8000 or slot 2 for an AV3000. Select either a DS3, an OC3, or a DS1/DSX-1 for an AV3000 or AV8000 system.



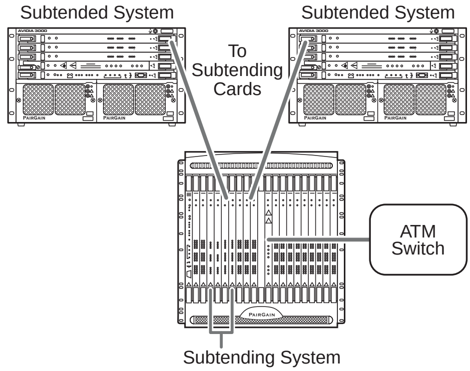

**Network Uplink Connection**

Select a card that accommodates the required network uplink bandwidth for all the systems that are aggregated by the subtending system. Ensure that the subtending system's network uplink card is not a bottleneck for traffic. For example, use an OC3 or DS3 card for larger systems since these cards provide greater bandwidth. Use a DS1/DSX-1 card for an initial implementation where Avidia systems have only a few cards with the intention of expanding service in the future.

**Select the subtending channel cards.**
Install a card in the channel-side of the *subtending* system for each system that will be subtended, up to the maximum allowed number of cards (see the table on page 47):




- DS1 that can be installed in any channel card slot
- DSX-1 that can be installed in the second line card slot
- DS3 that can be installed in the second line card slot
- OC3 that can be installed in the second line card slot and in any two channel card slots




**Select the subtended line cards.** Install a card in the line-side of the *subtended* system (see the table on page 47) that is compatible with the card you selected in "Select the subtending channel cards" above. For example, if you select a DS1 card for subtending, then use one of the following:

- DS1 card in slot 3 of a subtended AV3000 system
- OC3 card in slot 2 of a subtended AV3000 system
- DSX-1 or OC3 card in slot 11 or 12 of a subtended AV8000 system
- DS1 line/management card in slot 1 of a 2200

The line-side interface provides the network line interface to the subtending system.

Refer to the applicable *Avidia 8000 and 8100 Installation Manual, Avidia 3000 and 8100 Installation Manual*, or *Avidia 2200 Installation Manual* for more information about installing systems and placement of cards.

## Star Configuration

Consider what traffic contract you need to set up for each connection and what policing, through the Usage Parameter Control (UPC), applies to the connection.The traffic contract and policing you select is dependent on the service you provide. The traffic contract and policing selection should maximize the network throughput and minimize end-to-end delays, thus efficiently utilizing the network. Complete the following sections to set up the connections for subtending.

**Create ATM Profiles.** Create ATM profiles, if required, for the service you will supply (see "Configuring ATM Traffic Profiles" on page 154 (command-line interface) or "Configuring ATM Traffic Profiles" on page 428 (Web interface) for more information). Remember that upstream and downstream rates and the QoS must be supported end-to-end.

Select a traffic type. See page 20 for a list of available traffic types.

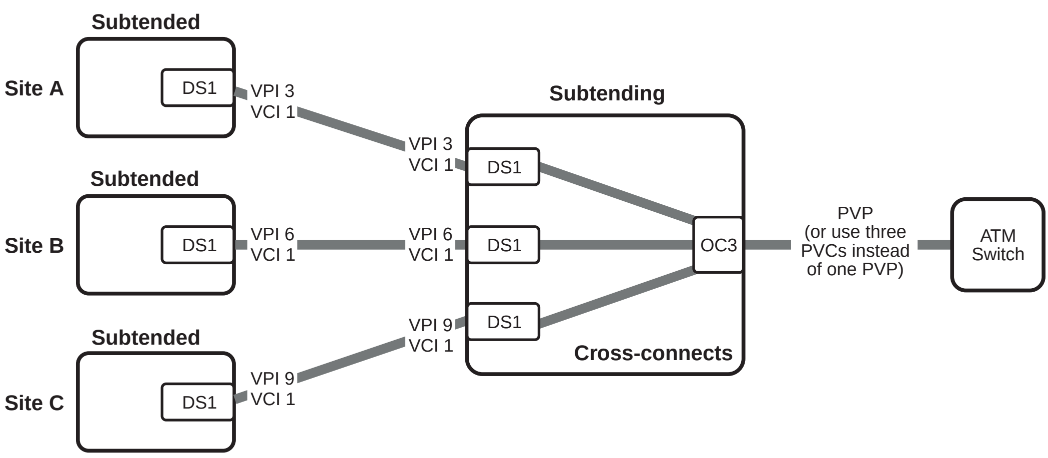
Select a value for traffic parameters to complete the traffic contract. See page 21 for a list of traffic parameters available.

**Configure Service.** For each card that is subtending or subtended, configure the applicable service:

- DS1/DSX-1: see “Configuring DS1 Service” on page 143 (command-line interface) or “Configuring DS1 Service” on page 417 (Web interface)
- DS3: see “Configuring DS3 Service” on page 149 (command-line interface) or “Configuring DS3 Service” on page 422 (Web interface)
- OC3 service: see “Configuring OC3 Service” on page 142 (command-line interface) or “Configuring OC3 Service” on page 416 (Web interface)

**Configure ATM Connections.** Configure the PVCs (ATM circuits), using the profiles that you created for service (see “Configuring ATM Virtual Circuits” on page 153 for the command-line interface or “Configuring ATM Virtual Circuits” on page 427 for the Web interface). Essentially, these are the connections you must set up, as shown in the following figure:

- from the subtended card port to the subtending card port
- from each subtending card port to the network uplink card (cross-connects)
- from the network uplink card (line interface) port to the ATM switch




The network administrator will assign the VPI/VCI values. The values shown in the above illustration are for example only. The network administrator can set up VPI/VCI values in a meaningful way to differentiate between nodes or areas of subtended sites.

**Select Policing.** The UPC policing function monitors and regulates traffic flow at the interface to ensure the traffic conforms to the configured traffic contract (see page 50 for information about the traffic contract). Policing protects the network from intentional or unintentional changes in the traffic contract that could affect other connections. If you enable policing and traffic does not conform, it is deleted. Policing validates parameters such as VPI/VCI values, traffic rates conforming to contract. Policing can be enabled per one of the following: ATM port, PVC, or PVP.

**Subtending Configuration.** When you subtend systems using DS1/DSX-1 cards, set up the subtending relationships using the command-line interface.

## Daisy Chain Management

A daisy chain is a serial link (or cascaded link) of up to three systems that has one network uplink connection and is viewed as one integrated system. A daisy chain is an approach for managing systems to support subscribers who are physically separated by distance. The daisy chain comprises:

- one system functioning on the edge of the network to aggregate and switch ATM transmissions and provide the network uplink
- up to two systems functioning as access devices

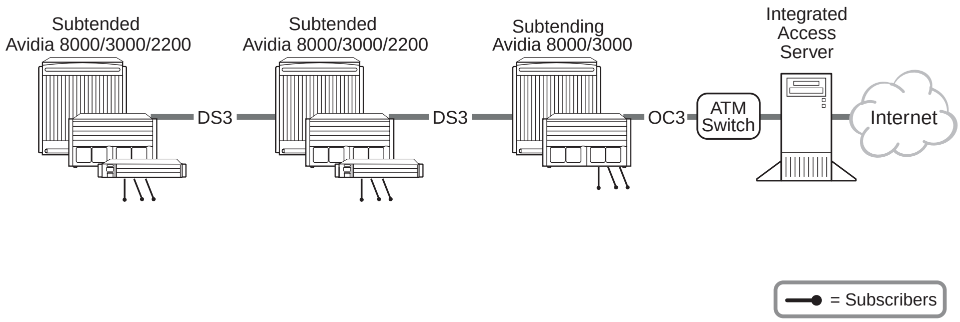
Each system, whether subtending or subtended, can connect to and manage subscriber traffic (modems).

“Daisy Chain Physical Implementation” on page 52 shows how to set up the daisy chain using Avidia systems. “Daisy Chain Configuration” on page 55, shows how to configure the system to implement the appropriate connections.

### Daisy Chain Physical Implementation

The relationship of subtending in a daisy chain configuration is shown in the following figure. Use two cards per system to connect a daisy chain. One card, used as a line-side interface, connects to the next system upstream in the chain. Upstream connects toward the network interface. The second card, used as a channel-side interface, connects to the next system downstream in the chain. Downstream connects further from the network interface.

The example shows an OC3 interface as the network uplink for the entire subtended system. An AV8000 or AV3000 is the subtending system. The two chassis are subtended and are at two separate physical locations (sites). The subtending connection is through a DS3 link.

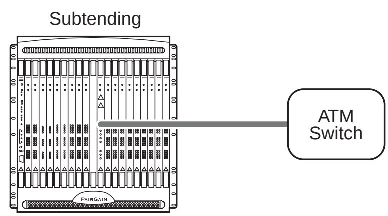



Plan your daisy chain system considering these factors:

- Plan an alternate or second path (such as a SONET ring) to re-route traffic in the event of a failure of any link in the daisy chain.
- Connect a maximum of three systems in the daisy chain, considering the maximum distance allowed between system based on type of transmission.

The following sections describe how to select cards for the various subtending connections. The figures show selection examples using the same system shown on page 53.

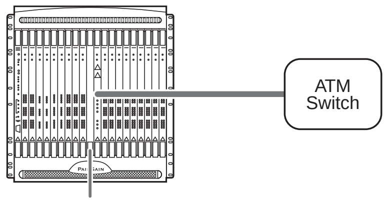
**Select the uplink card.** Install one card for the network uplink in the *subtending* system. The card must reside in slot 11 or 12 for an AV8000 or slot 2 for an AV3000. Select either a DS3, an OC3, or a DS1/DSX-1 for an AV3000 or AV8000 system.




**Network Uplink Connection**

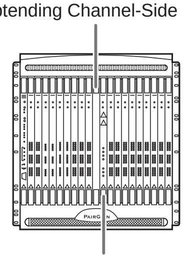
Select a card that accommodates the required network uplink bandwidth for all the systems that are aggregated by the subtending system. Ensure that the subtending system's network uplink card is not a bottleneck for traffic. For example, use an OC3 or DS3 card for larger systems since these cards provide greater bandwidth. Use a DS1/DSX-1 card for an initial implementation where Avidia systems have only a few cards with the intention of expanding service in the future.

**Select the subtending channel card.** Install a card in the channel-side of each of the first two systems that are *subtending* the downstream system, up to the maximum allowed number of cards (see the table on page 47):




- DS1 that can be installed in any channel card slot
- DSX-1 that can be installed in the second line card slot
- DS3 that can be installed in the second line card slot
- OC3 that can be installed in the second line card slot and in any two channel card slots

**Select the subtended line cards.** Install a card in the line-side of the two *subtended* systems (see the table on page 47) that is compatible with the card you selected in “Select the subtending channel card” on page 54. For example, if you select a DS1 card for subtending, then use one of the following:




- DS1 card in slot 2 of a subtended AV3000 system
- OC3 card in slot 2 of a subtended AV3000 system
- DSX-1 or OC3 card in slot 11 or 12 of a subtended AV8000 system
- DS1 line/management card in slot 1 of a subtended 2200.

The line-side interface provides the network line interface to the subtending system.

Refer to the applicable *Avidia 8000 and 8100 Installation Manual, Avidia 3000 and 8100 Installation Manual* or *Avidia 2200 Installation Manual* for more information about installing systems and placement of cards.

## Daisy Chain Configuration

Consider what traffic contract you need to set up for each connection and what policing, through the Usage Parameter Control (UPC), applies to the connection.The traffic contract and policing you select is dependent on the service you provide. The traffic contract and policing selection should maximize the network throughput and minimize end-to-end delays, thus efficiently utilizing the network. Complete the following sections to set up the connections for subtending.

**Create ATM Profiles.** Create ATM profiles, if required, for the service you will supply (see “Configuring ATM Traffic Profiles” on page 154 for the command-line interface or “Configuring ATM Traffic Profiles” on page 428 for the Web interface). Remember that upstream and downstream rates and the QoS must be supported end-to-end.

Select a traffic type. See page 20 for a list of available traffic types.

Select a value for traffic parameters to complete the traffic contract. See page 21 for a list of traffic parameters available.

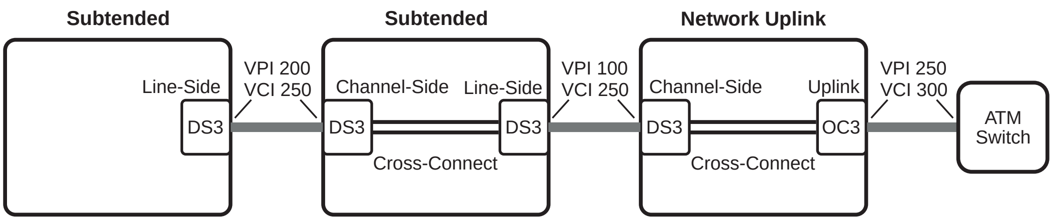
**Configure Service.** For each card that is subtending or subtended, configure the applicable service:

- DS1/DSX-1: see “Configuring DS1 Service” on page 143 (command-line interface) or “Configuring DS1 Service” on page 417 (Web interface)
- DS3: see “Configuring DS3 Service” on page 149 (command-line interface) or “Configuring DS3 Service” on page 422 (Web interface)
- OC3 service: see “Configuring OC3 Service” on page 142 (command-line interface) or “Configuring OC3 Service” on page 416 (Web interface)

**Configure ATM Connections.** Configure the cross connections (ATM circuits), using the profiles that you created for service (see “Configuring ATM Virtual Circuits” on page 153 for the command-line interface or “Configuring ATM Virtual Circuits” on page 427 for the Web interface). Essentially, these are the connections you must set up, as shown in the following figure:

- from the channel-side card to the line-side card in each subtended system
- from the line-side card in the subtended system to the upstream channel-side card in the subtending system
- from the channel-side card to the network uplink card (cross-connects) in the subtending system
- from the network uplink card (line interface) port to the ATM switch

The network administrator will assign the VPI/VCI values. The values shown in the above illustration are for example only. The network administrator can set up VPI/VCI values in a meaningful way to differentiate between nodes or areas of subtended sites.




**Select Policing.** The UPC policing function monitors and regulates traffic flow at the interface to ensure the traffic conforms to the configured traffic contract (see page 50 for information about the traffic contract). Policing protects the network from intentional or unintentional changes in the traffic contract that could affect other connections. If you enable policing and traffic does not conform, it is deleted. Policing validates parameters such as VPI/VCI values, traffic rates conforming to contract. Policing can be enabled per one of the following: ATM port, PVC, or PVP.

**Subtending Configuration.** When you subtend systems using DS1/DSX-1 cards, set up the subtending relationships using the command-line interface.

# OAM Alarms and Loopbacks

Operation, Administration and Maintenance (OAM) provides a set of standard functions that the network uses for fault management that:

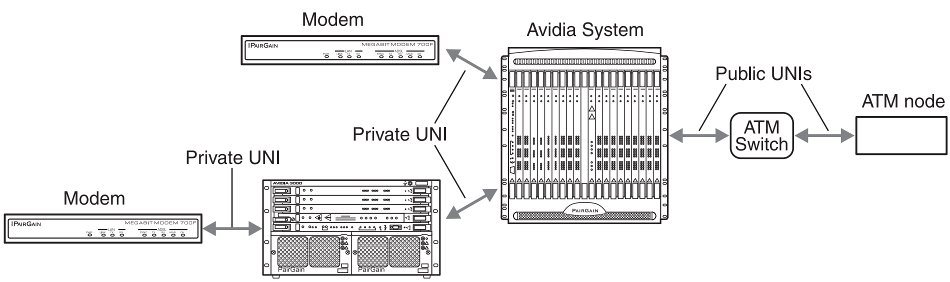
- surveys alarms
- performs loopback tests (connectivity verification)
- provides continuity checks between ATM devices

OAM testing is not disruptive to ATM virtual channels (VPCs and VCCs), which makes it ideal for testing and troubleshooting live ATM networks. OAM cells are carried in the same VPCs and VCCs that carry end-user traffic; therefore, the VPCs and VCCs remain active while performing OAM ATM-layer testing.

Avidia systems support OAM management functions across the User-Network Interface (UNI) which can be either public (Avidia to an ATM network switch) or private (Avidia to Avidia or Avidia to a modem). Avidia systems can both respond to and generate OAM cells. Avidia implements these OAM flows:

- F4, which provides ATM-layer management functions at a VPC level
- F5, which provides ATM-layer management functions at a VCC level

The following figure shows connections that the OAM management functions can test.




## About Alarm Surveillance

When the physical layer detects an error such as loss of signal or loss of cell synchronization, a VPC or VCC failure is indicated to the ATM layer with an Alarm Indication Signal (AIS) and a Remote Defect Indicator (RDI). When the Avidia system receives an AIS, it responds with an RDI. Both signals contain a field that specifies the type of failure and where the failure occurred.

## About ATM Loopbacks

Avidia supports a fault management function that provides connectivity verification through ATM-layer loopback tests. You can run two different types of OAM loopbacks for both OAM flows F4 and F5:

- segment
- end-to-end

The OAM loopbacks are supported on these Avidia cards: OC3, DS3, DS1/DSX-1, SDSL cell, and ADSL cell. The Megabit Modem 700F, 600F, and 500L (software versions 2.6 and later) support the OAM F5 flow loopbacks. The Megabit Modem 700F, 600F, and 500L (software versions 2.8 and later) support the OAM F4 flow loopbacks.

OAM F4 and F5 flow segment loopbacks test the connectivity between any two uniquely addressable points in a VPC or VCC, respectively. Segment loopbacks are supported between these points (see the figure on page 57):

- Avidia channel card to loopback at a modem
- Avidia line card to loopback at an ATM switch
- Avidia line card to loopback at a node beyond the ATM switch
- ATM switch to loopback at a modem
- ATM switch to loopback at an Avidia line card
- ATM node beyond the ATM switch to loopback at a modem
- ATM node beyond the ATM switch to loopback at an Avidia line card

OAM F4 and F5 flow end-to-end loopbacks test the connectivity between any uniquely addressable point in the VPC or VCC, respectively, and any end point (such as a modem or network end point) where a VPC or VCC terminates. End-to-end loopbacks are supported between these points (see the figure on page 57):

- Avidia line card to loopback at an ATM switch (when the VPC or VCC terminates at the switch)
- Avidia line card to loopback at a node beyond the ATM switch
- Avidia line card to loopback at a modem
- ATM switch to loopback at a modem
- ATM node beyond the ATM switch to loopback at a modem

## OAM Location ID

OAM segment and end-to-end tests rely on OAM Location ID addresses to designate a source that originates the loopback test and a destination that is the target loopback device. The OAM Source Location ID address for Avidia systems is a unique sixteen-octet address and is entered in the format *xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx*, where x is an integer 0 through 9 or an alpha character a through f. The Source Location ID default is ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff. Set the OAM Source Location ID address for an Avidia system through either the command-line interface or through the Web interface. It is recommended that the OAM Source Location ID address for the Avidia system is set up with:

- a unique address that is meaningful to you for the first 13 octets (for example, you could use the prefix of the system ATM network address)
- all zeros for the last three octets

Similarly, other non-Avidia ATM devices in the network (for example, ATM switches) must have a unique OAM Location ID address to run OAM tests. This address is typically forwarded from the network service access point (NSAP) for the node.

The Megabit Modem, however, does not require an OAM Location ID address to be a destination for either a segment or end-to-end test. When a Megabit Modem is the destination, simply do not set a value in the OAM Destination Location ID address field.

The Location ID address and the ATM address are different and unique addresses for identifying each ATM device in an ATM network. See “ATM Device Addresses” on page 23 for more information about ATM addresses and Location IDs.

## Preparing to Run OAM Loopbacks

Do the following two sections before you run loopback tests.

### Verify PVCs

Before running an OAM test, it is important to verify that an operational PVC (VPC for an F4 loopback or VCC for an F5 loopback) is defined for every connection in the ATM network where the test runs. For example, in the simple case where you run an OAM segment loopback between an Avidia system and a Megabit modem, define a PVC for the Megabit Modem that corresponds to a PVC on the channel card port in the Avidia system to which the modem is connected.

In more complex OAM loopbacks, where an OAM segment or end-to-end loopback is run across multiple Avidia systems or ATM switches, a PVC must be defined within each ATM node in the test path.

## Checklist

Use the following as a checklist of information or processes needed to perform OAM ATM-layer loopback tests:

- Pre-configure all Avidia systems and ATM switches with an OAM Location ID.
- Ensure that all links and loops under test are operational.
- Ensure that the PVC(s) under test are correctly defined and operational at every hop in the test path.
- When originating the OAM loopback test from an Avidia system, know the slot, port, VPI, and VCI values.
- Have values identified for the OAM cell count, timeout, and delay.

  These optional values you can set up for the OAM ATM-layer loopbacks are:

  – count which is the total number of OAM cells to be sent
  – timeout value which is how long the source waits for a cell to be returned from the destination before indicating a failure
  – delay which is the number of seconds the system waits between transmitting OAM cells
- Determine if an SNMP Trap should be sent when the OAM loopback test is completed.

Run the OAM loopback using the section “Configuring and Initiating OAM Loopbacks” on page 342 (command-line interface) or “Configuring and Initiating OAM Loopbacks” on page 558 (Web interface).

## Example ATM-Layer Loopbacks

The following sections provide an overview on running some segment loopbacks. For an:

- Avidia channel card to loopback at a modem, see page 62.
- Avidia line card to loopback at an ATM switch, see page 63 (this can also be an end-to-end loopback when a VPC or VCC terminates at the switch).
- Avidia line card to loopback at an ATM node beyond the ATM switch, see page 63 (this can also be an end-to-end loopback when a VPC or VCC terminates at the ATM node).
- ATM switch to loopback at a modem, see page 64 (this can also be an end-to-end loopback).
- ATM switch to loopback at an Avidia line card, see page 65.
- ATM node beyond the ATM switch to loopback at a modem, see page 65 (this can also be an end-to-end loopback).
- ATM node beyond the ATM switch to loopback at an Avidia line card, see page 66.

The following sections provide an overview on running some end-to-end loopbacks. For an:

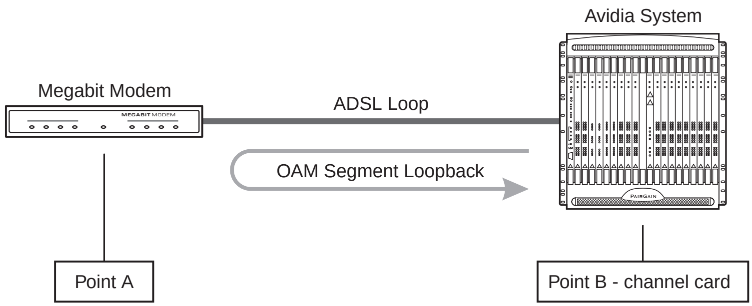
- Avidia line card to loopback at an ATM switch (when the VPC or VCC terminates at the switch), see page 63.
- Avidia line card to loopback at an ATM node beyond the ATM switch, see page 63 (this can also be a segment test).
- Avidia line card to loopback at a modem, see page 67.
- ATM switch to loopback at a modem, see page 64.
- ATM node beyond the ATM switch to loopback at a modem, see page 65.

You can also run loopbacks to subtended Avidia systems. For a subtended Avidia segment loopback, see page 68. To configure and run any OAM loopbacks, go to “OAM Alarms and Loopbacks” on page 57.

## Avidia Channel Card to Modem Segment Loopback

The ADSL modems (Megabit Modem 700F, 600F, and 500L software versions 2.6 and later) support F5 flow OAM loopbacks. (Megabit Modem 700F, 600F, and 500L software version 2.7 and earlier do not support F4 flow loopback for VPCs.) Since an xDSL modem terminates ATM service, the modem automatically loops back any OAM loopback cells it receives on any configured PVC. The modem does not require additional configuration or addressing (such as an OAM Location ID address) to respond to OAM loopback test cells.

The figure below shows a simple Avidia to modem OAM segment loopback. The segment test is run between an ADSL channel card (AV541) and a Megabit Modem 700F, 600F, or 500L. The modem must have at least one user session (PVC) defined and active. Depending on the model of the modem, the session could be either PPP (Megabit Modem 700F, 600F, or 500L) or bridging/routing (Megabit Modem 700F only).



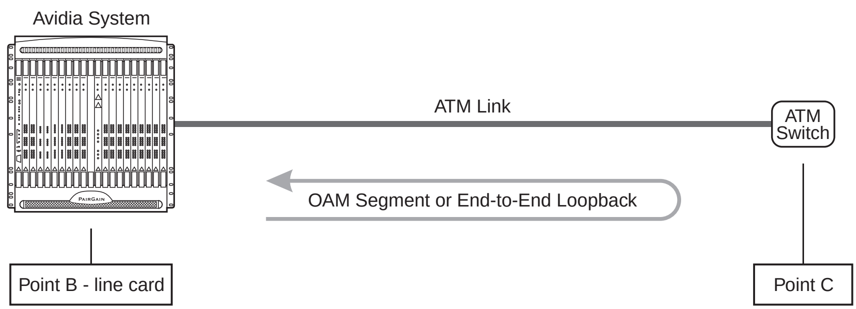

In the loopback example shown above, the OAM test cells originate and terminate at the source Avidia channel card (point B). The modem (point A), which is the target or destination device, does not generate any OAM cells. The modem loops back OAM test cells to the originating or source device (point B).

You can configure OAM loopbacks to run on each separately defined and active PVC for the Megabit Modem 700F and 600F since these modems support multiple simultaneously active PVCs. The Megabit Modem 700F supports up to 32 simultaneously active PVCs. The Megabit Modem 600F supports up to three simultaneously active PVCs.

## Avidia Line Card to ATM Switch Segment or End-to-End Loopback

The Avidia line card to ATM switch segment or end-to-end loopback originates and terminates at the source Avidia line card (point B). The loopback target or destination is the ATM switch (point C), as shown in the figure below. You must specify for this test the:

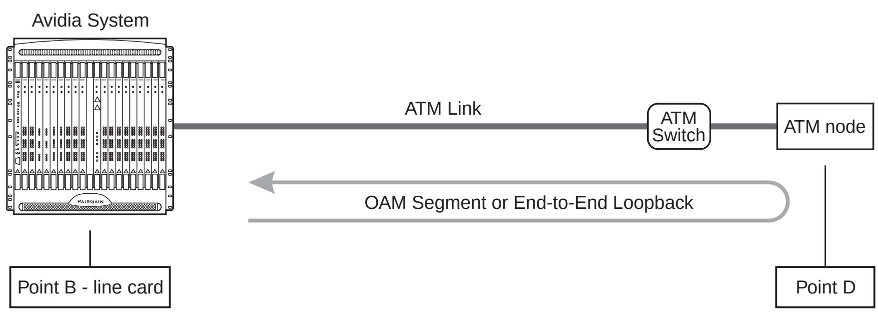
- VPI/VCI for an OAM F5 flow VCC or VPI only for an OAM F4 flow VPC
- OAM Destination Location ID for the ATM switch




## Avidia Line Card to ATM Node Segment or End-to-End Loopback

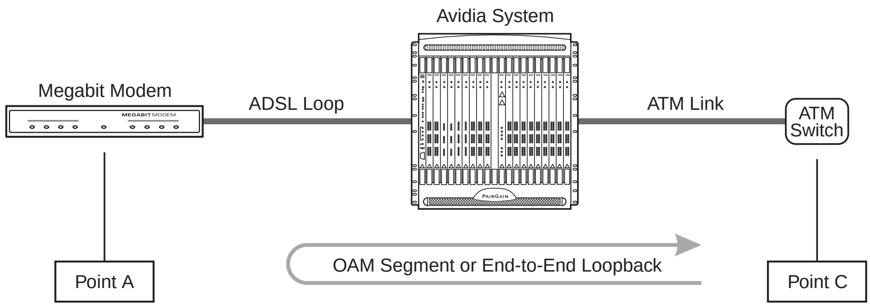
The Avidia line card to ATM node (beyond the ATM switch) segment or end-to-end loopback originates and terminates at the source Avidia line card (point B). The loopback target or destination is the ATM node (point D), as shown in the figure below. You must specify for this test the:

- VPI/VCI for an OAM F5 flow VCC or VPI only for an OAM F4 flow VPC
- OAM Destination Location ID for the ATM node



## ATM Switch to Modem Segment or End-to-End Loopback

The ATM switch to modem segment or end-to-end loopback test originates and terminates at an ATM switch (point C). The loopback target or destination is the modem (point A), as shown in the figure below. The loopback verifies a PVC from an ATM switch through to the modem. In this test that originates at the ATM switch, the Avidia system is a passive ATM device; that is, it simply passes the OAM F4 or F5 flow test cells, generated by the ATM switch, transparently to the modem.



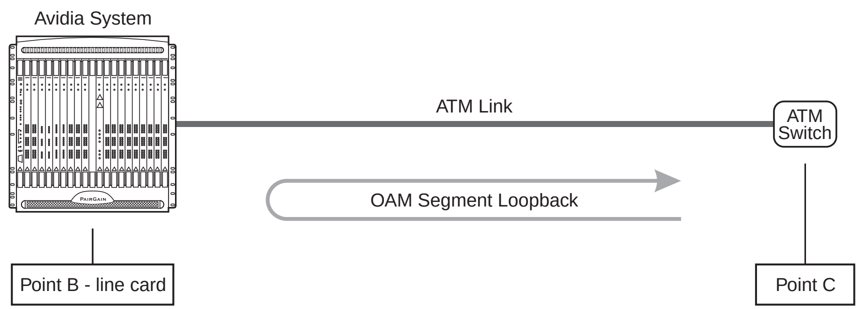

To perform this test, the user must be familiar with the OAM commands for the ATM switch. The user must specify the:

- VPI/VCI for an OAM F5 flow VCC or VPI only for an OAM F4 flow VPC (for the test which is sent to the Avidia-to-switch interface)
- destination or target Location ID address (as defined at Point A) for an OAM loopback may be required by some ATM switches (the modem does not have a Location ID so you can leave the Destination Location ID as a default value if that value is different than the OAM Location ID for the Avidia system)

## ATM Switch to Avidia Line Card Segment Loopback

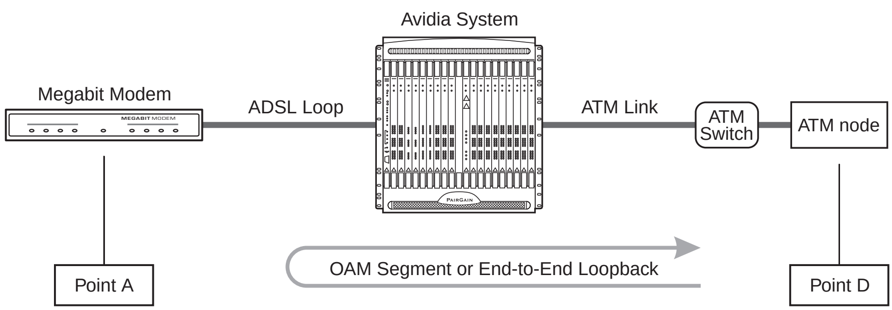
The ATM switch to Avidia line card segment loopback originates and terminates at the source ATM switch (point C). The loopback target or destination is the Avidia line card (point B), as shown in the figure below. At the ATM switch, the user must specify for this test the:

- VPI/VCI for an OAM F5 flow VCC or VPI only for an OAM F4 flow VPC
- OAM Destination Location ID for the Avidia system




## ATM Node to Modem Segment or End-to-End Loopback

The ATM node (beyond the ATM switch) to modem segment or end-to-end loopback test originates and terminates at an ATM node (point D). The loopback target or destination is the modem (point A), as shown in the figure below. The loopback verifies a PVC from an ATM node through to the modem. In this test that originates at the ATM node, the Avidia system is a passive ATM device; that is, it simply passes the OAM F4 or F5 flow test cells, generated by the ATM switch, transparently to modem.



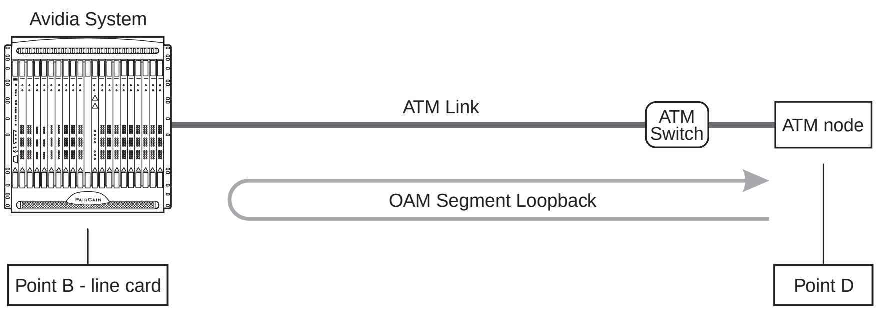
To perform this test, the user must be familiar with the OAM commands for the ATM node. The user must specify the:

- VPI/VCI for an OAM F5 flow VCC or VPI only for an OAM F4 flow VPC
- destination or target Location ID address (as defined at Point A) for an OAM loopback may be required by some ATM nodes (the modem does not have a Location ID, so leave the Destination Location ID as a default value if that value is different than the OAM Location ID for the Avidia system)

## ATM Node to Avidia Line Card Segment Loopback

The ATM node (beyond the ATM switch) to Avidia line card segment loopback originates and terminates at the source ATM node (point D). The loopback target or destination is the Avidia line card (point B), as shown in the figure below. At the ATM node, the user must specify for this test the:

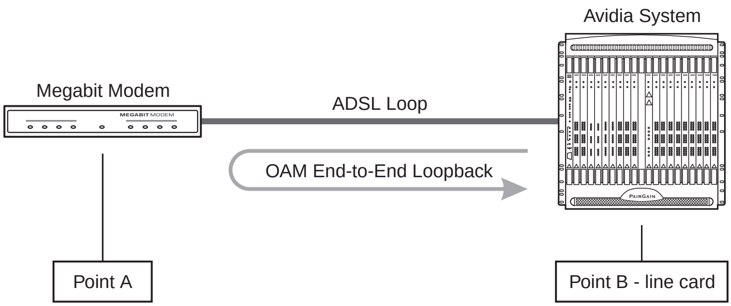
- VPI/VCI for an OAM F5 flow VCC or VPI only for an OAM F4 flow VPC
- OAM Destination Location ID for the Avidia system



## Avidia Line Card to Modem End-to-End Loopback

The ADSL modems (Megabit Modem 700F, 600F, and 500L software versions 2.6 and later) support F5 flow OAM loopbacks. (Megabit Modem 700F, 600F, and 500L software version 2.7 and earlier do not support F4 flow loopback for VPCs.) Since an xDSL modem terminates ATM service, the modem automatically loops back any OAM loopback cells it receives on any configured PVC. The modem does not require additional configuration or addressing (such as an OAM Location ID address) to respond to OAM loopback test cells.

The figure below shows a simple Avidia line card to modem OAM end-to-end loopback. The end-to-end test is run between an ATM line card and an ADSL modem (Megabit Modem 700F, 600F, or 500L). The modem must have at least one user session (PVC) defined and active. Depending on the model of the modem, the session could be either PPP (Megabit Modem 700F, 600F, or 500L) or bridging/routing (Megabit Modem 700F only).



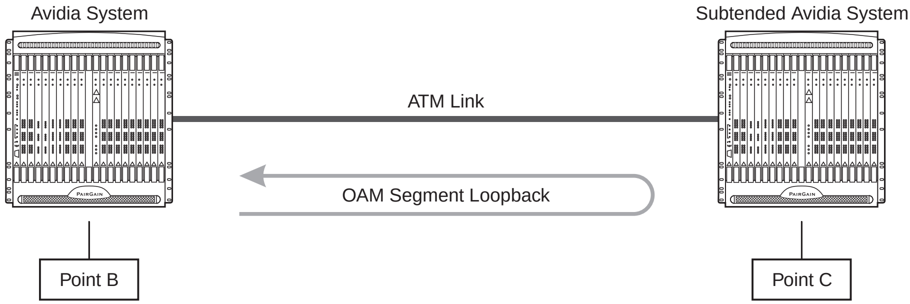

In the loopback example shown above, the OAM test cells originate and terminate at the source Avidia ATM line card (point B). The modem (point A), which is the target or destination device, does not generate any OAM cells. The modem loops back OAM test cells to the originating or source device (point B).

Configure OAM loopbacks to run on each separately defined and active PVC for the Megabit Modem 700F and 600F since these modems support multiple simultaneously active PVCs. The Megabit Modem 700F supports up to 32 simultaneously active PVCs. The Megabit Modem 600F supports up to three simultaneously active PVCs.

### Segment Loopback for a Subtended Avidia System

Multiple systems can be implemented, viewed, and managed as if they were one system. This type of management is known as subtending. Avidia systems can subtend other Avidia systems or Avidia systems can be subtended by other ATM devices, such as ATM switches.

The user can manage or subtend a remote Avidia system using another Avidia system. One possible link between the subtending Avidia system and the subtended or remote Avidia system is an Avidia OC-3 line card (AV311, AV312, or AV313). The subtending Avidia system (point B) originates and terminates the OAM loopback, as shown in the figure below. The loopback target or destination is the subtended Avidia system (point C). The loopback test for this subtended segment functions in much the same way as a segment OAM loopback is performed between an Avidia system and a modem (page 62). Enter the OAM Location ID for the subtended system (point C) as the OAM Destination Location ID.




See "Subtending Multiple Systems" on page 45 for more information about subtending systems.

## After Running Loopbacks

After loopbacks are completed, check for the following results:

- Examine the OAM Loopback status to see if the test successfully completed or failed.
- If the test failed, use OAM to isolate the failing ATM link, PVC, or component. Also check the Avidia loop and link performance statistics and interface counters.
- Take corrective action, as required, and repeat the OAM test until it runs successfully.
- When initiating the loopback test from an ATM switch, use the documentation supplied with that product for OAM testing procedures.

# AVIDIA ALARM MANAGER

An Alarm Manager stores all the alarm information for the entire system. The alarm manager is stored on the management card, however each individual card installed in the system also stores alarm information for its own ports. If you replace the management card, the new management card retrieves the current alarm information from the individual cards to build a new alarm database.

# CONFIGURING AVIDIA SYSTEM INFORMATION

To enable access to the Avidia Web Interface, you must first configure the management card IP address and subnet mask using the command-line interface. To simplify network management, you should also configure:

- system identification information
- trap generation
- boot file information
- system date and time
- default gateway
- trap receivers
- community strings (only configurable using the command-line interface)

# SETTING UP CONNECTIONS

The following sections list the tasks you need to perform to set up service for these interfaces.

## DS1 Line/Management Combination Card

The DS1 line/management card acts as both a line and an AMC card, providing configuration and management support for the Avidia system as well as eight DS1 uplinks to transmit subscriber traffic as ATM cells.

You must configure both DS1 and system parameters when configuring the DS1 line/management card. You cannot directly configure a DS1 line/management card using StarGazer. Instead, the Avidia system containing the DS1 line/management card must first be subtended to an AV8000 or AV3000 system (see “Subtending Multiple Systems” on page 45 for information on configuring subtending). Once the system is subtended, you can use in-band management to configure the DS1 and management parameters.

There are three steps in configuring a DS1 line/management card:

**1** Subtend the system containing the DS1 line/management card to an Avidia 8000 or 3000 (see “Subtending Multiple Systems” on page 45).

**2** Configure the system boot parameters, trap enablers, and identifiers for the system in which the DS1 line/management card resides (see “Subtending Multiple Systems” on page 45).

**3** Configure the DS1 ports on the DS1 line/management card. See “Configuring DS1 Service” on page 143 (command-line interface) or “Configuring DS1 Service” on page 417 (Web interface).

# Frame-based Services

Set up service for either an IDSL or SDSL frame-based card using one of the following sections.

## SDSL Frame Service

The following shows the configuration process for setting up SDSL frame-based service.

- Create one or more SDSL frame line profiles. See "Configuring SDSL Frame Line Profiles" on page 111 (command-line interface) or "Configuring SDSL Frame Line Profiles" on page 393 (Web interface).
- Create one or more SDSL frame alarm profiles. See "Configuring SDSL Frame Alarm Profiles" on page 114 (command-line interface) or "Configuring SDSL Frame Alarm Profiles" on page 395 (Web interface).
- Provision service for the SDSL frame card. Configure the ports (includes selecting the SDSL frame line profile and SDSL frame alarm profile for each port). See "Configuring SDSL Frame Service" on page 117 (command-line interface) or "Configuring SDSL Frame Service" on page 397 (Web interface).
- Create the VCC through the Avidia system (from the line card to the SDSL frame-based card). See "Configuring PVCCs" on page 170 (command-line interface) or "Configuring PVPCs" on page 433 (Web interface) for more information.
- Configure a session to set the service and encapsulation types for the VCC. The available encapsulation types depend upon the service type you select and both must match the modem encapsulation type. See "Configuring Bridging and Routing Sessions" on page 228 (command-line interface) or "Configuring Bridging and Routing Sessions" on page 486 (Web interface) for more information.

## IDSL Service

Do the following to configure IDSL frame-based services:

- Create one or more IDSL line profiles. See "Configuring IDSL Line Profiles" on page 127 (command-line interface) or "Configuring IDSL Line Profiles" on page 406 (Web interface).
- Create one or more IDSL alarm profiles. See "Configuring IDSL Alarm Profiles" on page 130 (command-line interface) or "Configuring IDSL Alarm Profiles" on page 408 (Web interface).
- Configure service for the IDSL frame card ports, including selecting the IDSL card transmit clock source. See "Configuring IDSL Service" on page 133 (command-line interface) or "Configuring IDSL Service" on page 411 (Web interface).
- Select either ATM VCC or Frame Relay to match the modem. For example, if you are using a WebRamp 450i modem configured with Ramp1483 service type, configure an ATM VCC using ramp1483 encapsulation type. If the WebRamp 450i modem is configured for Frame Relay, you will need to set up Frame Relay service. See "Frame Relay Transmission" on page 26 for information on configuring Frame Relay service.

| Connection Type | | Use This Setup |
|---|---|---|
| Frame Relay | | Select this connection type for modems using Frame Relay. |
| | Step 1 | Configure the frame relay link for each port, which involves setting the LMI (Local Management Interface) parameters. The LMI type defines the method of exchanging status information between the customer device and the network. The available LMI types are:<br>• LMI Rev-1<br>• ITU 0.933 Annex-A<br>• ANSI T1 617 Annex-D<br>• no LMI support |
| | Step 2 | Configure the FRF.5 or FRF.8 circuit for each port. This includes creating the cross connect through the Avidia system (from the line card to the IDSL frame card), and configuring cell loss priority, congestion control, and the traffic type. The available traffic types are:<br>• ubr (Unspecified Bit Rate)—This is a best-effort class of traffic that is best suited for LAN. When network congestion occurs, the data is stored in a buffer until it can be sent.<br>• cbr (Constant Bit Rate)—This traffic class carries a guaranteed constant bandwidth. It is best suited for applications that require fixed bandwidth, such as uncompressed voice, video, and circuit emulation. CBR is a Quality of Service class defined by the ATM Forum for ATM network.<br>• nrt-vbr (non-real-time Variable Bit Rate)—This traffic class carries variable bandwidth. It is well suited for data services such as frame relay over ATM which requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.<br>• rt-vbr (real-time Variable Bit Rate)—This traffic class carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video which require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size. |
| ATM VCC | | Select this connection type for modems that are not using Frame Relay but other protocols such as PPP. |
| | Step 3 | To connect to modems not configured with the frame relay protocol, add an ATM VCC (see “Configuring PVCCs” on page 170 for the command-line interface or “Configuring PVPCs” on page 433 for the Web interface). Adding a VCC includes selecting the channel parameters (specific IDSL card, the port, the service type, and the encapsulation method). The available encapsulation types depend upon the service type you select and both must match the modem encapsulation type. |

# Cell-based Services

Set up service for either an ADSL or SDSL cell-based card using one of the following sections.

## ADSL

The following shows the configuration process for setting up ADSL cell-based service.

- Create one or more ADSL line profiles. See "Configuring ADSL Line Profiles" on page 100 (command-line interface) or "Configuring ADSL Line Profiles" on page 386 (Web interface).
- Create one or more ADSL alarm profiles. See "Configuring ADSL Alarm Profiles" on page 104 (command-line interface) or "Configuring ADSL Alarm Profiles" on page 388 (Web interface).
- Provision service for the ADSL card. Configure the ports, including assigning the ADSL line and alarm profiles to ADSL ports. See "Configuring ADSL Service" on page 109 (command-line interface) or "Configuring ADSL Service" on page 391 (Web interface).
- Create the cross connect through the Avidia system from the line card to the ADSL cell-based card. See "Configuring PVCCs" on page 170 (command-line interface) or "Configuring PVPCs" on page 433 (Web interface) for more information.

## Cell-based SDSL

To configure SDSL cell service, you must:

- configure SDSL cell line profiles. See "Configuring SDSL Cell Line Profiles" on page 119 (command-line interface) or "Configuring SDSL Cell Line Profiles" on page 399 (Web interface).
- configure SDSL cell alarm profiles. See "Configuring SDSL Cell Alarm Profiles" on page 121 (command-line interface) or "Configuring SDSL Cell Alarm Profiles" on page 401 (Web interface).
- configure SDSL cell ports. See "Configuring SDSL Cell Service" on page 124 (command-line interface) or "Configuring SDSL Cell Service" on page 404 (Web interface).
- establish ATM connections between ports across the Avidia chassis. See "Configuring PVCCs" on page 170 (command-line interface) or "Configuring PVPCs" on page 433 (Web interface) for more information.

# SAVING CONFIGURATIONS

**As soon as you make configuration changes, the information is saved to RAM on the management card and each of the cards affected by the configuration. However, if you unplug or reboot any of these cards before you manually save the configuration changes to NVRAM, the changes are lost. You can save configuration changes to NVRAM using either the Web interface or the command-line interface.**

# PART II

# THE AVIDIA COMMAND-LINE INTERFACE

This section contains the following chapters, which explain how to configure and manage an Avidia system using the Avidia command-line interface:

# Introduction to the Command-Line Interface 4

The Avidia command-line interface provides comprehensive Avidia system management, including configuration, performance monitoring, and system maintenance and administration. The command-line interface comes preinstalled on the Avidia management card, and is accessed through a terminal connected to the management card craft port or over a network using a telnet session.

This chapter provides an introduction to the command-line interface, including:

# LOGGING ON TO THE COMMAND-LINE INTERFACE

You can log on to the command-line interface locally, using a terminal, or remotely, using a telnet session. For connection instructions, see Chapter 2 on page 11. Only one user can be logged on to the command-line interface at a time, and the local user takes priority over the remote user.

If a user is logged on locally, and another user attempts to log on remotely, the remote user cannot log on. The following messages display:

- on the remote user's screen: `sorry, shell is locked`
- on the local user's screen: `someone tried to login from network address` *`xxx.xxx.xxx.xxx`*

If a user is logged on remotely and another user attempts to log on locally, the following message displays on the local user's screen:

`This system in use via telnet from network address` *xxx.xxx.xxx.xxx*

If the local user presses any key, the system disconnects the remote user and the local user can then log on to the command-line interface. The system displays the following messages:

- on the remote user's screen: `Connection to host lost`
- at the remote user's command-line interface prompt: `Console is active`

The messages on the remote user's screen may display immediately, or they may display the next time the remote user presses any key.

**1** Do one of the following:

- To log on locally, turn on a terminal that is connected to the management card craft port, then press ENTER to initiate the terminal session and display the `Username:` prompt.
- To log on remotely, initiate a telnet session from a remote PC, then connect to the management card IP address (see your telnet application documentation for instructions on initiating a telnet session). Press ENTER to display the `Username:` prompt.

**2** Type your user name, then press ENTER.

The user name **admin** is preconfigured for your use.

The `Password` prompt displays.

**3** Type your password, then press **ENTER**.

The password for the preconfigured *admin* user name is **`dslam`**.

The system displays a list of general commands and navigational tips, followed by the `::root=>` prompt.

**The command-line interface Inactivity Timer automatically logs the current user off if the keyboard remains inactive for five minutes. When this happens, follow the previous instructions to log on to the command-line interface again. To change the length of the Inactivity Timer, see "Setting the Command-Line Interface Timeout Option" on page 367.**

# UNDERSTANDING COMMAND-LINE INTERFACE STRUCTURE

The command-line interface has four main system prompts, from which most other prompts stem:

- `Configuration`—for configuring system information, xDSL service, Permanent Virtual Paths (PVPs), Permanent Virtual Channels (PVCs), and bridging/routing sessions.
- `Display`—for displaying system information and performance data.
- `Administration`—for administrative tasks such as uploading, downloading and copying files.
- Diagnostics—for configuring and initiating OAM loopbacks.

Throughout the command-line interface, you can control the scrolling of data on the screen as follows:

- Type **`more`** then press **ENTER** before typing a command to view the data that results from that command one screen at a time. The system displays the first screen of data then prompts you to display the next screen.
- Type **`all`** then press **ENTER** before typing a command to view the data that results from that command all at once.

# Navigating the Command-Line Interface

To navigate the command-line interface:

- Type a prompt name then press ENTER to move to that prompt.
- Type **up** then press ENTER to return to the previous prompt.
- Type **top** then press ENTER to return to the root system prompt.
- Type **exit**, **quit** or **bye** then press ENTER to log off the system.

# Command-Line Interface Conventions

Typeface conventions:

- **Bold Courier** type indicates a command to be typed exactly as shown.
- Unbolded Courier type indicates onscreen messages or prompts.
- <Angle brackets> indicate a parameter for which you need to provide an appropriate value.
- [Square brackets] indicate an optional parameter.
- [<Angle brackets within square brackets>] indicate an optional parameter that, should you opt to include it, requires you to provide an appropriate value.
- (**Multiple|Values**) in parenthesis separated by a vertical line indicate that you must select one of the values for that parameter. However, parentheses may also contain parameters for which you need to provide a value. For example, (**all**|<port>) indicates that you can type **all** to view all ports or type a port number to view a specific port.
- Some optional parameters contain both a command and a parameter for which you need to select from a finite set of values. For example, [**-admin** (**up**|**down**)] requires you to type **-admin up** or **-admin down**, should you choose to include the parameter. Optional parameters follow the required parameters in the command line, and can be included in any order.
- *Italic* type indicates the format in which you type the information specified in the procedure.

Command-line interface commands:

- can be abbreviated as long as the abbreviation is distinct
- are not case sensitive

# Getting Help

The following help commands are available from each prompt.

| To: | Type the following then press ENTER: |
|---|---|
| Display a list of commands available from the current prompt. | **?** |
| Display more detailed information about the commands available from the current prompt. | **help** |
| Display an explanation of a particular command. | ***command name*** **?**<br>(For example: **new ?**) |
| Display a list of the last 20 commands you have entered during the current session. | **history** |
| Repeat a particular command. | **!#**<br>(where *#* is the command number listed on the command history screen) |
| Repeat the last command entered. | **!!** |
| Display an explanation of all navigational and help-related commands. | **about** |

# Logging Off the Command-Line Interface

The command-line interface logs the current user off automatically if no keyboard input is received for a set period of time. See "Setting the Command-Line Interface Timeout Option" on page 367.

To log off the command-line interface manually, type **exit**, **bye** or **quit** at any prompt, then press ENTER.

# CONFIGURING SYSTEM PARAMETERS 5

This chapter describes how to configure system parameters, such as system identifiers, trap receivers and community strings.

# CONFIGURING SYSTEM INFORMATION

You configure system information from the `::system=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::system=>` prompt.

**`configuration system`**

## Configuring the System Name

The system name displays as part of the system prompt, which makes it easy to keep track of which system you are logged on to. From the `::system=>` prompt, type the name command in the following format then press **ENTER**.

**`name`** `(<name>|"<name with spaces>")`

### Parameters

`<name>`

The `name` text string can contain any characters except quotation marks and can be any length, up to 256 characters. You can use multiple words separated by an underscore.

`<name with spaces>`

The `name with spaces` text string can contain any characters except quotation marks and can be any length, up to 256 characters. You can use multiple words separated by spaces.

### Examples

`::system=>` **`name system_100`**
(changes the root prompt to `system_100::root=>`)

`::system=>` **`name "system 100"`**
(changes the root prompt to `system 100::root=>`)

## Configuring the System Contact

The system contact information makes it easy for you to quickly identify who to contact regarding the system. From the `::system=>` prompt, type the contact command in the following format then press **ENTER**.

**`contact`** `(<contact>|"<contact with spaces>")`

### Parameters

`<contact>`

The `contact` text string can contain any characters and can be any length, up to 256 characters. However, if you include quotation marks in the `contact` text string, the quotation marks must be preceded by a backward slash (\). You can use multiple words separated by an underscore.

`<contact with spaces>`

The `contact with spaces` text string can contain any characters and can be any length, up to 256 characters. You can use multiple words separated by spaces. If you include quotation marks in the `contact with spaces` text string, the quotation marks must be preceded by a backward slash (\).

### Examples

`::system=>` **`contact John_Smith`** (Sets the contact name to John_Smith.)

`::system=>` **`contact "John Smith"`** (Sets the contact name to John Smith.)

`::system=>` **`contact \"John_Smith\"`** (Sets the contact name to "John_ Smith".)

## Configuring the System Location

The system location information helps you keep track of where each system in the network is located. To set the system location, type the location command in the following format then press **ENTER**.

**location** (<location>|"<location with spaces>")

### Parameters

<location>

The `location` text string can contain any characters and can be any length, up to 256 characters. However, if you include quotation marks in the `location` text string, the quotation marks must be preceded by a backward slash (\). You can use multiple words separated by an underscore.

<location with spaces>

The `location with spaces` text string can contain any characters and can be any length, up to 256 characters. You can use multiple words separated by spaces. If you include quotation marks in the `location with spaces` text string, the quotation marks must be preceded by a backward slash (\).

### Examples

::system=> **location Building_A** (Sets location to Building_A.)

::system=> **location "Building A"** (Sets location to Building A.)

::system=> **location Building_\"A\"** (Sets location to Building_"A".)

## Configuring the System Date and Time

It is important to set the system date and time so the alarms and events logs reflect the actual time each event occurred. From the ::system=> prompt, type the time command in the following format then press **ENTER**.

**time** <hh>:<mm>:[<ss>] [<mm>/<dd>/<yyyy>]

**The Avidia system automatically supports leap year dates.**

### Parameters

<hh>

The current hour represented in two-digit 24-hour format (for example, 2 a.m. is represented by the numbers 02, and 2 p.m. is represented by the number 14).

<mm>

The current minute represented in two-digit format (for example, 03).

[<ss>]

The current second represented in two-digit format (for example, 03).

[<mm>]

The current month represented in numerical format (for example, August is represented by 8 or 08).

[<dd>]

The current day of the month (for example, 5 or 05).

[<yyyy>]

The current year, in four-digit format (1999).

### Example

::system=> **time 02:03:03 07/05/1999**

## Configuring Boot File Information

You must specify the location from which to boot the management card image file. For an explanation of Avidia image files, see "Avidia System File Management" on page 8. From the `::system=>` prompt, type the boot command in the following format then press **ENTER**.

**boot** (**nvram**|**network**) [<file> [<ipaddr>]]

### Parameters

(**nvram**|**network**)

Specifies the location of the image file you want to boot. Options:

**nvram**—Boots the specified image file from the management card NVRAM.

**network**—Boots the specified image file from a network.

`[<file>]` (This parameter is required if you set the previous parameter to **network**.)

The complete path and file name of the image file you want to boot, including the file name extension. If the image file is stored on a TFTP server in a directory other than the default directory, you must specify the path. See your TFTP server documentation to determine the required path syntax. If you do not specify the file name, the management card attempts to boot the available image files in the following order:

1. amc.new—An image file that has been downloaded from a TFTP server but has not yet been booted or validated. Once the file has been validated, the file name extension is automatically changed to .bin.
2. amc.bin—The image file that came preinstalled on the management card or an image file that was downloaded from a TFTP server and has been booted and validated by the management card.
3. amc.alt—A backup image file you can create prior to downloading a new image file.

`[<ipaddr>]` (This parameter is required if you set the previous parameter to **network**.)

The IP address of the TFTP server on the network from which you want to boot the image file.

### Examples

```
::system=> boot nvram
::system=> boot network amc.bin 10.0.0.121
```

## Displaying System Information

You can display the current system information to verify your configuration. From the `::system=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays.

```
::system=> show
System Name:                         System #100
System Contact:                      John Smith
System Location:                     Building A
System Description:                  Avidia
System Up Time (d:h:m:s)             2:3:20:55

AMC Card Ethernet Port MAC Address:  00 20 a7 10 00 52

Agent Trap:                          disable
Agent Authentication Trap:           enable

Boot Server IP Address:              10.0.0.121
Boot File:                           amc.bin
Boot Mode:                           nvram

System Time/Date:                    Fri, Jun 11 2000 10:47:00
```

# CONFIGURING IP ADDRESSES

You set the system IP address, subnet mask and default gateway (router) to enable communication with external networks and to enable access to the Web interface. The default management card IP address is 192.168.0.1.

You can configure the default gateway when you set the system IP address and subnet mask, or as a separate procedure.

You configure IP addresses from the `::ip=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::ip=>` prompt.

**`configuration ip`**

## Configuring the System IP Address, Subnet Mask and Default Gateway

From the `::ip=>` prompt, type the addr command in the following format then press **ENTER**.

**addr** `<ipaddr> [<netmask>] [<defaultroute>]`

### Parameters

`<ipaddr>`

The management card IP address for the Avidia system. This address is based on the Ethernet network to which the Avidia system is attached (format *xxx.xxx.xxx.xxx)*.

**You cannot use IP addresses 192.168.1.0 through 192.168.21.255 with subnet mask 255.255.255.0 as these addresses are restricted for internal Avidia system use.**

`[<netmask>]`

The subnet mask associated with the management card IP address, if a subnet exists. This address is based on the Ethernet network to which the Avidia system is attached (format *xxx.xxx.xxx.xxx)*.

`[<defaultroute>]`

The IP address of a router on the Ethernet network through which the Avidia system can communicate with external networks (format *xxx.xxx.xxx.xxx*).

### Example

`::ip=>` **addr 192.168.0.1 255.255.255.0 192.168.0.100**

## Configuring the Gateway IP Address

If a gateway exists on the network to which the Avidia system is attached and you did not configure the gateway with the IP address, from the `::ip=>` prompt type the defaultroute command in the following format then press **ENTER**. The default gateway IP address is 192.168.0.100.

**`defaultroute`** `<gwaddr>`

### Parameter

`<gwaddr>`

The IP address of a router on the Ethernet network through which the Avidia system can communicate with external networks (format *xxx.xxx.xxx.xxx*).

### Example

`::ip=>` **`defaultroute 192.168.0.100`**

## Displaying the System IP Addresses

From the `::ip=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays.

```
::ip=> show

  AMC Card Ethernet Port IP Address:        192.168.0.1
  AMC Card Ethernet Port IP Subnet Mask:    255.255.255.0
  AMC Card Default Gateway:                 192.168.0.100
```

# CONFIGURING TRAP GENERATION STATUS

Traps are messages sent from the management card regarding system events, such as alarms. The Avidia system distinguishes between two types of traps. Agent authentication traps are generated when the system receives an invalid SNMP community string. (See "Configuring Community Strings" on page 97 for more information on community strings.) General traps are generated in response to system events such as alarms and configuration changes. You must specify whether or not you want the system to generate each type of trap.

You configure trap generation status from the `::system=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::system=>` prompt.

**`configuration system`**

Type the trap command in the following format then press **ENTER**.

`trap [-trap (enable|disable)] [-authtrap (enable|disable)]`

### Parameters

`[-trap (enable|disable)]`

The trap generation status for general traps. Type **`-trap enable`** or **`-trap disable`**.

`[-authtrap (enable|disable)]`

The trap generation status for agent authentication traps. Type **`-authtrap enable`** or **`-authtrap disable`**.

### Example

```
::system=> trap -trap enable -authtrap disable
```

# CONFIGURING TRAP RECEIVERS

Trap receivers are network management stations (NMSs) that are designated to receive SNMP traps (messages) sent by the management card. The management card can send traps to multiple trap receivers. However, trap receivers are not required to operate the Avidia system.

You configure trap receivers from the `::trap=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::trap=>` prompt.

**`configuration snmp trap`**

## Adding Trap Receivers

You can configure up to 32 trap receivers using the command-line interface. From the `::trap=>` prompt, type the new command in the following format then press **ENTER**.

**`new`** `<index> <ipaddr> <subnetmask> <community> (`**`snmpv1|snmpv2c`**`)`

### Parameters

`<index>`

The trap receiver table index number that you want to associate with this trap receiver.

`<ipaddr>`

The IP address of the trap receiver (format *xxx.xxx.xxx.xxx*).

`<subnetmask>`

The subnet mask of the trap receiver (format *xxx.xxx.xxx.xxx*).

`<community>`

The text string required by the trap receiver to receive traps. If the traps sent by the management card do not contain this community string, the trap receiver rejects the traps. The community string *public* is commonly used for trap receivers.

`(`**`snmpv1|snmpv2c`**`)`

The SNMP version used by the trap receiver. Type either **`snmpv1`** to specify SNMP version 1 or type **`snmpv2c`** to specify SNMP version 2c.

### Example

`::trap=>` **`new 1 90.0.0.5 255.255.255.0 public snmpv1`**

## Displaying Trap Receivers

To verify your trap receiver configuration, from the `::trap=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays.

```
::trap=> show

  Index  Network Address  Subnet Mask    Community  Version
   1     90.0.0.5         255.255.255.0  public     SNMPv1
   2     90.0.0.6         255.255.255.0  private    SNMPv2c
```

## Deleting Trap Receivers

1. From the `::trap=>` prompt, type **`show`** then press **ENTER** to display the configured trap receivers.
2. Note the index number of the trap receiver you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **`delete`** `<index>`

### Parameter

`<index>`

The trap receiver table index number of the trap receiver you want to delete.

### Example

`::trap=>` **`delete 2`**

# CONFIGURING COMMUNITY STRINGS

Community strings are text strings that allow an NMS or EMS, such as StarGazer™ to access the Avidia system. They also assign the NMS the appropriate read/write privileges. You can configure multiple community strings, delete community strings and display the configured community strings.

You configure community strings from the `::community=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::community=>` prompt.

**`configuration snmp community`**

## Adding Community Strings

From the `::community=>` prompt, type the new command in the following format then press **ENTER**.

`new (read|write) <community>`

### Parameters

`(read|write)`

Determines which access privileges an NMS using the specified community string has. Options:

**read**—The NMS can read the Avidia system information, such as configurations and performance statistics, but cannot modify any configuration or system settings.

**write**—The NMS can both read and modify Avidia system configurations and system information.

`<community>`

The text string that you want to enable as a valid community string. An NMS bearing this community string can access the Avidia system with the access privileges specified using the `(read|write)` parameter. The community strings *private* and *public* are preconfigured.

### Example

`::trap=>` **`new read engineering`**

## Displaying Community Strings

From the `::community=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays. The read_view and write_view columns indicate whether or not the community string has read or write privileges. `All` indicates that the community string has the privilege, while a minus sign indicates that it does not.

```
::community=> show

  community          privilege      read_view    write_view
  private            read-write     All          All
  public             read-only      All          -
  engineering        read-only      All          -
```

## Deleting Community Strings

**The community strings *private* and *public* are preconfigured. If you delete the *private* community string, the command-line interface will not work.**

1 From the `::community=>` prompt, type **`show`** then press **ENTER** to display the configured community strings.

2 Note the exact spelling of the community string you want to delete.

3 Type the delete command in the following format then press **ENTER**.

```
delete <community>
```

### Parameter

`<community>`

The community string you want to delete.

### Example

```
::community=> delete engineering
```

# CONFIGURING SUBSCRIBER SERVICES 6

This chapter describes how to configure service for ADSL, SDSL frame, SDSL cell, and IDSL lines through the command-line interface.

# CONFIGURING ADSL LINE PROFILES

ADSL line profiles contain a preconfigured set of parameters, including the transmit rate, rate adaptation mode, target margin, and interleave delay. ADSL port configuration requires you to apply an ADSL line profile to the line, therefore you must configure the desired ADSL line profile before configuring the ADSL port. A default profile exists with an index of 1. You cannot delete the default profile.

You configure ADSL line profiles from the `::line=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::line=>` prompt.

**`configuration adsl profile line`**

## Adding ADSL Line Profiles

From the `::line=>` prompt, type the new command in one of the following formats then press **ENTER** to create a new ADSL line profile. The profile is automatically assigned the next available index number in the ADSL line profile table.

```
new fixed <margin> <upstream delay> <downstream delay> <maximum
upstream rate> <maximum downstream rate>
```

```
new adaptive <margin> <upstream delay> <downstream delay>
<maximum upstream rate> <maximum downstream rate> <minimum
upstream rate> <minimum downstream rate>
```

### Parameters

(**fixed|adaptive**)

The form of transmit rate adaptation. Options:

**fixed**—The loop must be able to come up at the specified maximum upstream rate, or it does not come up at all.

**adaptive**—The loop will come up at the highest achievable rate that is greater than the specified minimum upstream rate but less than the maximum upstream rate. This adaptation occurs at startup only.

`<margin>`

The upstream target signal-to-noise margin in decibels that the modem must achieve with a BER of $10^{-7}$ or better to successfully complete initialization. The margin value is typically 6. A lower margin may result in a higher data rate, but increases noise on the line.

`<upstream delay>`

The upstream interleave delay, in milliseconds. This specifies the delay between consecutive data bits. Larger delays improve noise immunity but reduce transmission speeds. A delay of 16 milliseconds is ideal for maximum noise immunity. However, a delay of 4 to 6 milliseconds is recommended for maximum transmission speed.

`<downstream delay>`

The downstream interleave delay, in milliseconds. This specifies the delay between consecutive data bits. Larger delays improve noise immunity but reduce transmission speeds. A delay of 16 milliseconds is ideal for maximum noise immunity. However, a delay of 4 to 6 milliseconds is recommended for maximum transmission speed.

`<maximum upstream rate>`

The maximum upstream transmit rate, in kbps. This is the highest transmission rate to which the modem can adapt for all lines to which the profile is applied.

`<maximum downstream rate>`

The maximum downstream transmit rate, in kbps. This is the highest transmission rate to which the modem can adapt for all lines to which the profile is applied.

`<minimum upstream rate>`

The minimum upstream transmit rate, in kbps. This is the highest transmission rate to which the modem can adapt for all lines to which the profile is applied.

`<minimum downstream rate>`

The minimum downstream transmit rate, in kbps. This is the highest transmission rate to which the modem can adapt for all lines to which the profile is applied.

## Examples

```
::line=> new fixed 4 6 4 928 7552

::line=> new adaptive 4 6 4 928 7552 64 64
```

## Displaying ADSL Line Profiles

From the `::line=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<index>]

### Parameter

[<index>]

The ADSL line profile table index number of the profile you want to display. Omitting this parameter displays the entire ADSL line profile table.

### Examples

::line=> **show 3**

::line=> **show**

The following screen illustrates an example of both show line commands.

```
::line=> show 1
                 Upstream                        Downstream
Index Mode       Mgn MinTx   MaxTx   Delay Mgn   MinRx   MaxRx   Delay

  1   adaptive   6   650     928      16    6     1500    3200    16


::line=> show
                 Upstream                        Downstream
Index Mode       Mgn MinTx   MaxTx   Delay Mgn   MinRx   MaxRx   Delay

  1   adaptive   6   650     928     5      6     1500    3200    5
  2   adaptive   6   650     928     6      6     1500    3200    6
  3   fixed      6           928     6      6             3200    6
  4   fixed      6           928     6      6             3200    6
```

## Deleting ADSL Line Profiles

**You cannot delete profiles that are assigned to ports.**

1. From the `::line=>` prompt, type **`show`** then press **ENTER** to display the ADSL line profile table.
2. Note the index number of the ADSL line profile you want to delete.
3. Type the delete command in the following format then press **ENTER**.

    ```
    delete <index>
    ```

### Parameter

`<index>`

The index number of the ADSL line profile you want to delete.

### Example

```
::line=> delete 2
```

# Configuring ADSL Alarm Profiles

ADSL alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). Only one trap is sent for each 15-minute data collection period. ADSL port configuration requires assigning an alarm profile, therefore you must configure the desired alarm profile prior to configuring the ADSL port. A default profile exists with an index of 1. You cannot delete the default profile.

You configure ADSL alarm profiles from the `::alarm=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::alarm=>` prompt.

**`configuration adsl profile alarm`**

## Adding ADSL Alarm Profiles

From the `::alarm=>` prompt, type the new command in the following format then press **ENTER** to create a new ADSL alarm profile. The profile is automatically assigned the next available index number in the ADSL alarm profile table.

**`new`** `<ulof> <ulos> <ues> <dlof> <dlos> <des>`

### Parameters

`<ulof>`

Upstream loss of frame threshold. This threshold determines the acceptable number of seconds in a 15-minute data collection period during which the frames lose sync on the ADSL interface. In a normal environment with sufficient margin, a typical loss of frame threshold value is 10. A value of **`0`** disables the alarm.

`<ulos>`

Local loss of signal threshold. The loss of signal threshold determines the acceptable number of seconds in a 15-minute ADSL performance data collection period during which the line power falls below the target margin threshold. In a normal environment with sufficient margin, a typical loss of signal threshold value is 10. A value of **`0`** disables the alarm.

`<ues>`

Local errored seconds threshold. This threshold is the acceptable number of seconds in a 15-minute data collection period during which errors occur on the ADSL interface that prevent the payload from being corrected. In a normal environment with sufficient margin, a typical errored seconds threshold value is 10. A value of **`0`** disables the alarm.

`<dlof>`

Downstream loss of frame threshold.

`<dlos>`

Downstream loss of signal threshold.

`<des>`

Downstream errored seconds threshold.

### Example

::alarm=> **new 10 10 10 10 10 10**

## Displaying ADSL Alarm Profiles

From the `::alarm=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<index>]

### Parameter

[<index>]

The ADSL alarm profile table index number of the profile you want to display. Omitting this parameter displays the entire ADSL alarm profile table.

### Examples

::alarm=> **show 1**

::alarm=> **show**

The following screen shows an example of both show alarm commands.

```
::alarm=> show 1
          Upstream                Downstream
Index     LOFs  LOSs  ESs         LOFs  LOSs  ESs
 1        10    10    10          10    10    10


::alarm=> show
          Upstream                Downstream
Index     LOFs  LOSs  ESs         LOFs  LOSs  ESs
 1        10    10    10          10    10    10
 2        8     8     8           8     8     8
 3        10    10    10          10    10    10
```

## Deleting ADSL Alarm Profiles

**You cannot delete profiles that are assigned to ports.**

1 From the `::alarm=>` prompt, type **`show`** then press **ENTER** to display the configured ADSL alarm profiles.

2 Note the index number of the profile you want to delete.

3 Type the delete command in the following format then press **ENTER**.

**`delete`** `<index>`

### Parameter

`<index>`

The index number of the alarm profile you want to delete.

### Example

`::alarm=>` **`delete 3`**

# CONFIGURING ADSL HANDSHAKING

The ADSL handshaking and line code parameters provide compatibility with a wide range of modems. The selected handshaking protocol determines the line code options available:

- If handshaking is set to t1.413, the line code is automatically set to t1.413
- If handshaking is set to g.hs, set the line code to g.lite or g.dmt.

You configure the ADSL handshaking and line code from the `::handshake=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::handshake=>` prompt.

**`configuration adsl handshake`**

## Setting Handshaking Parameters

From the `::handshake=>` prompt, type the set command in the following format then press **ENTER**.

**`set`** `<port> (`**`g.hs|t1.413`**`) [`**`-force`** `(`**`g.lite|g.dmt`**`)]`

### Parameters

`(`**`g.hs|t1.413`**`)`

The handshaking mode for the port, either g.hs or t1.413.

`[`**`-force`** `(`**`g.lite|g.dmt`**`)]`

The line code setting for the port, either g.lite or g.dmt.

### Example

```
set 5.1 g.hs -force g.lite
```

## Displaying Handshaking Parameters

From the `::handshake=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<port>]

### Parameter

[<port>]

The port for which you want to display the handshaking parameters (format *slot.port*). Omitting this parameter displays the parameters for all configured ADSL channels.

### Examples

::handshake=> **show 5.1**

::handshake=> **show**

The following screen illustrates an example of both show adsl commands. In addition to displaying the configured parameters, it also displays the line coding and line type.

```
::handshake=> show
Port        Protocol        Standard
 5.1        T1.413             T1.413
 5.2        T1.413             T1.413
 5.3        T1.413             T1.413
 5.4        T1.413             T1.413
 5.5        T1.413             T1.413

::handshake=> show 5.1
Port        Protocol        Standard
 5.1        T1.413             T1.413
```

# Configuring ADSL Service

Before configuring an ADSL port, make sure you have:

- ❒ Set up the desired ADSL line profile (see "Adding ADSL Line Profiles" on page 100 for instructions).
- ❒ Set up the desired ADSL alarm profile (see "Adding ADSL Alarm Profiles" on page 104 for instructions).

You configure ADSL channels from the `::adsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::adsl=>` prompt.

**`configuration adsl`**

## Adding ADSL Port Configurations

Each ADSL port is automatically assigned a default configuration. The default profile index number for each adsl profile type is 1. This procedure describes how to modify the configuration to reflect the desired service.

1. From the `::adsl=>` prompt, type the following command then press **ENTER** to display the `::line=>` prompt.

   **`profile line`**

2. Type **`show`** then press **ENTER** to display the configured line profiles.
3. Note the index number of the line profile you want to assign to the channel.
4. Type the following command then press **ENTER** to display the `::alarm=>` prompt.

   **`configuration adsl profile alarm`**

5. Type **`show`** then press **ENTER** to display the configured alarm profiles.
6. Note the index number of the alarm profile you want to assign to the channel.
7. Type the following command then press **ENTER** to display the `::adsl=>` prompt.

   **`configuration adsl`**

8. Type the set command in the following format then press **ENTER**.

   **`set`** `<port> <lpindex> <apindex> (`**`up|down`**`)`

### Parameters

`<port>`

The channel slot and port number (format *slot.port*).

`<lpindex>`

The index number of the line profile you want to assign to this channel.

`<apindex>`

The index number of the alarm profile you want to assign to this channel.

(**up**|**down**)

The administrative status of the line. **Up** activates the port. **Down** deactivates the port.

### Example

```
::adsl=> set 4.2 3 6 up
```

## Displaying ADSL Port Configurations

From the `::adsl=>` prompt, type the show command in the following format then press ENTER.

**show** [<port>]

### Parameter

[<port>]

The port for which you want to display the configuration (format *slot.port*). Omitting this parameter displays the configurations for all configured ADSL channels.

### Examples

`::adsl=>` **`show 4.1`**

`::adsl=>` **`show`**

The following screen illustrates an example of both show adsl commands. In addition to displaying the configured parameters, it also displays the line coding and line type.

```
::adsl=> show
                                     Line    Alarm   Admin
Port Coding Type                     Profile Profile Status

4.1  DMT    Physical/Interleave      1        1      up
4.2  DMT    Physical/Interleave      3        7      down
4.3  DMT    Physical/Interleave      8        2      up

::adsl=> show 4.1
                                     Line    Alarm   Admin
Port Coding Type                     Profile Profile Status

4.1  DMT    Physical/Interleave      1        1      up
```

# CONFIGURING SDSL FRAME LINE PROFILES

SDSL frame line profiles contain a preconfigured set of parameters, including the rate adaptation mode and the transmit rate. SDSL frame port configuration requires you to apply an SDSL frame line profile to the line. Therefore you must configure the desired SDSL frame line profile before configuring the SDSL frame port. A default profile exists with an index of 1. You cannot delete the default profile.

You configure SDSL frame line profiles from the `::line=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::line=>` prompt.

**`configuration sdsl frame profile line`**

## Adding SDSL Frame Line Profiles

Currently, Fixed Rate is the only supported rate adaptation mode, therefore all SDSL frame line profiles are automatically configured for Fixed Rate.

From the ::line=> prompt, type the new command in the following format then press **ENTER** to create a new SDSL frame line profile.

**new** <rate>

### Parameters

<rate>

The desired transmit rate, in kbps. The valid range supported by the SDSL frame card is from 64 to 2,048, in increments of 64. However, the specified rate must be supported by the remote modem. See the remote modem documentation to verify the supported data rates.

### Example

::line=> **new 768**

## Displaying SDSL Frame Line Profiles

From the ::line=> prompt, type the show command in the following format then press **ENTER**.

**show** [<index>]

### Parameter

[<index>]

The SDSL frame line profile table index number of the profile you want to display. Omitting this parameter displays the entire SDSL line profile table.

### Examples

::line=> **show 1**

::line=> **show**

The following screen illustrates an example of both show line commands.

```
::line=> show 1

Index    Rate_Mode     Rate
1        Fixed Rate    1536

::line=> show

Index    Rate_Mode     Rate
1        Fixed Rate    1536
2        Fixed Rate     768
```

## Deleting SDSL Frame Line Profiles

**You cannot delete profiles that are assigned to ports.**

1. From the ::line=> prompt, type **show** then press **ENTER** to display the SDSL frame line profile table.
2. Note the index number of the SDSL frame line profile you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **delete** <index>

### Parameter

<index>

The index number of the SDSL frame line profile you want to delete.

### Example

::line=> **delete 2**

# CONFIGURING SDSL FRAME ALARM PROFILES

SDSL frame alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). Only one trap is sent for each 15-minute data collection period. SDSL frame port configuration requires assigning an alarm profile, therefore you must configure the desired alarm profile prior to configuring the SDSL frame port. A default profile exists with an index of 1. You cannot delete the default profile.

You configure SDSL frame alarm profiles from the `::alarm=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::alarm=>` prompt.

**`configuration sdsl frame profile alarm`**

## Adding SDSL Frame Alarm Profiles

From the `::alarm=>` prompt, type the new command in the following format then press **ENTER** to create a new SDSL frame alarm profile. The profile is automatically assigned the next available index number in the SDSL frame alarm profile table.

**`new`** `<loswmode> <mgn> <mgnmode> <es> <esmode> <uas> <uasmode>`

### Parameters

`<loswmode>`

Loss of Sync Word alarm setting. A Loss of Sync Word alarm occurs when one of the SDSL frame loops is out of sync. Type **`enable`** or **`disable`**.

`<mgn>`

The margin threshold value, in decibels. When the margin falls below the specified threshold, the margin alarm is activated. A typical margin threshold value is 6.

`<mgnmode>`

The margin alarm setting. Type **`enable`** or **`disable`**.

`<es>`

The errored seconds threshold. When the number of errored seconds in the current 15-minute data collection interval exceeds the specified threshold, the errored seconds alarm is activated. Errored seconds are seconds during which errors occur that prevent the payload from being corrected. A typical errored second threshold value is 17.

`<esmode>`

The errored seconds alarm setting. Type **`enable`** or **`disable`**.

`<uas>`

The unavailable seconds threshold. When the number of unavailable seconds in the current 15-minute data collection interval exceeds the specified threshold, the UAS alarm is activated. Unavailable seconds are seconds during which the SDSL frame loop is not synchronized. A typical unavailable seconds threshold value is 60.

`<uasmode>`

The unavailable seconds alarm setting. Type **`enable`** or **`disable`**.

### Example

```
::alarm=> new enable 6 enable 17 enable 60 enable
```

## Displaying SDSL Frame Alarm Profiles

From the `::alarm=>` prompt, type the show command in the following format then press **ENTER**.

**`show`** `[<index>]`

### Parameter

`[<index>]`

The SDSL frame alarm profile table index number of the profile you want to display. Omitting this parameter displays the entire SDSL frame alarm profile table.

### Examples

```
::alarm=> show 1
```

```
::alarm=> show
```

The following screen shows an example of both show alarm commands.

```
::alarm=> show 1
Index  LOSW    Mgn  Mgn_Mode  ES  ES_Mode  UAS  UAS_Mode
1      enable  6    enable    17  enable   60   enable


::alarm=> show
Index  LOSW    Mgn  Mgn_Mode  ES  ES_Mode  UAS  UAS_Mode
1      enable  6    enable    17  enable   60   enable
2      disable 6    enable    17  disable  60   enable
```

## Deleting SDSL Frame Alarm Profiles

**You cannot delete profiles that are assigned to ports.**

1 From the ::alarm=> prompt, type **show** then press **ENTER** to display the configured SDSL frame alarm profiles.

2 Note the index number of the profile you want to delete.

3 Type the delete command in the following format then press **ENTER**.

**delete** <index>

### Parameter

<index>

The index number of the alarm profile you want to delete.

### Example

::alarm=> **delete 3**

# CONFIGURING SDSL FRAME SERVICE

Before configuring an SDSL port, make sure you have:

- ❒ Set up the desired SDSL line profile (see “Configuring SDSL Frame Line Profiles” on page 111 for instructions).
- ❒ Set up the desired SDSL alarm profile (see “Configuring SDSL Frame Alarm Profiles” on page 114 for instructions).

You configure SDSL frame channels from the `::frame=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frame=>` prompt.

**`configuration sdsl frame`**

## Adding SDSL Frame Port Configurations

Each SDSL frame port is automatically assigned a default configuration. The default profile index number for each SDSL frame profile type is 1. This procedure describes how to modify the configuration to reflect the desired service.

1. From the `::frame=>` prompt, type the following command then press **ENTER** to display the `::line=>` prompt.

   **`profile line`**

2. Type **`show`** then press **ENTER** to display the configured line profiles.
3. Note the index number of the line profile you want to assign to the channel.
4. Type the following command then press **ENTER** to display the `::alarm=>` prompt.

   **`configuration sdsl frame profile alarm`**

5. Type **`show`** then press **ENTER** to display the configured alarm profiles.
6. Note the index number of the alarm profile you want to assign to the channel.
7. Type the following command then press **ENTER** to display the `::frame=>` prompt.

   **`configuration sdsl frame`**

8. Type the set command in the following format then press **ENTER**.

   **`set`** `<port> <lpindex> <apindex> (`**`up|down`**`)`

### Parameters

`<port>`

The channel slot and port number (format *slot.port*).

`<lpindex>`

The index number of the line profile you want to assign to this channel.

`<apindex>`

The index number of the alarm profile you want to assign to this channel.

(**up**|**down**)

The administrative status of the line. **Up** activates the port. **Down** deactivates the port.

### Example

::frame=> **set 4.2 3 6 up**

## Displaying SDSL Frame Port Configurations

From the `::frame=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<port>]

### Parameter

[<port>]

The port for which you want to display the configuration (format *slot.port*). Omitting this parameter displays the configurations for all configured SDSL frame channels.

### Examples

::frame=> **show 4.1**

::frame=> **show**

The following screen illustrates an example of both show sdsl commands.

```
::frame=> show
                Line          Alarm           Admin
Port            Profile       Profile         Status

4.1             1             1               up
4.2             2             4               down

::frame=> show 4.1
                Line          Alarm           Admin
Port            Profile       Profile         Status

4.1             1             1               up
```

# CONFIGURING SDSL CELL LINE PROFILES

SDSL cell line profiles contain a preconfigured set of parameters, including the rate adaptation mode and the transmit rate. SDSL cell port configuration requires you to apply an SDSL cell line profile to the line, therefore you must configure the desired SDSL cell line profile before configuring the SDSL cell port. A default profile exists with an index of 1. You cannot delete the default profile.

You configure SDSL cell line profiles from the `::line=>` prompt. From the `::root=>` prompt, type the following command, then press **ENTER** to display the `::line=>` prompt.

**`configuration sdsl cell profile line`**

## Adding SDSL Cell Line Profiles

Currently, Fixed Rate is the only supported rate adaptation mode, therefore all SDSL cell line profiles are automatically configured for Fixed Rate.

From the `::line=>` prompt, type the new command in the following format then press **ENTER** to create a new SDSL cell line profile.

**`new`** `<rate>`

### Parameters

`<rate>`

The desired transmit rate, in kbps. The valid range supported by the SDSL cell card is from 64 to 2,048, in increments of 64. However, the specified rate must be supported by the remote modem. See the remote modem documentation to verify the supported data rates.

### Example

`::line=>` **`new 768`**

## Displaying SDSL Cell Line Profiles

From the `::line=>` prompt, type the show command in the following format, then press **ENTER**.

**`show`** `[<index>]`

### Parameter

`[<index>]`

The SDSL cell line profile table index number of the profile you want to display. Omitting this parameter displays the entire SDSL cell line profile table.

### Examples

`::line=>` **`show 1`**

`::line=>` **`show`**

The following screen illustrates an example of both show line commands.

```
::line=> show 1

Index    Rate_Mode     Rate
1        Fixed         1536

::line=> show

Index    Rate_Mode     Rate
1        Fixed         1536
2        Fixed         768
```

## Deleting SDSL Cell Line Profiles

**You cannot delete profiles that are assigned to ports.**

1. From the `::line=>` prompt, type **show** then press **ENTER** to display the SDSL cell line profile table.
2. Note the index number of the SDSL cell line profile you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **delete** <index>

### Parameter

<index>

The index number of the SDSL cell line profile you want to delete.

### Example

::line=> **delete 2**

# CONFIGURING SDSL CELL ALARM PROFILES

SDSL cell alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). Only one trap is sent for each 15-minute data collection period. SDSL cell port configuration requires assigning an alarm profile, therefore you must configure the desired alarm profile prior to configuring the SDSL cell port. A default profile exists with an index of 1. You cannot delete the default profile. Setting the threshold value to zero disables the trap.

You configure SDSL cell alarm profiles from the `::alarm=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::alarm=>` prompt.

**configuration sdsl cell profile alarm**

## Adding SDSL Cell Alarm Profiles

From the `::alarm=>` prompt, type the new command in the following format then press **ENTER** to create a new SDSL cell alarm profile. The profile is automatically assigned the next available index number in the SDSL cell alarm profile table.

```
new  <threshLOSS> <threshLOCD> <threshSLOCD> <threshSNR>
```

### Parameters

`<threshLOSS>`

The loss of signal seconds threshold. When the number of loss of signal seconds in the current 15-minute data collection interval exceeds the specified threshold, the loss of signal seconds alarm is activated. Loss of signal seconds are seconds during which the SDSL cell line is incapable of transmitting or receiving data and all data is lost.

`<threshLOCD>`

The loss of cell delineation threshold. When the number of loss of cell delineation seconds in the current 15-minute data collection interval exceeds the specified threshold, the loss of cell delineation alarm is activated. Loss of cell delineation seconds are seconds in which some cells transmitted during that second were lost.

`<threshSLOCD>`

The severe loss of cell delineation threshold. When the number of severe loss of cell delineation seconds in the current 15-minute data collection interval exceeds the specified threshold, the severe loss of cell delineation alarm is activated. During a severe loss of cell delineation second most of the cells transmitted during that second are lost.

`<threshSNR>`

The signal-to-noise ratio threshold. When the signal-to-noise ratio margin drops below the specified threshold in the current 15-minute collection interval, the signal-to-noise ratio alarm is activated. SNR margin is a measure of signal quality indicating how much margin can be dropped before the number of bit errors exceeds the ratio of $1x10^{-7}$ errored bits per bits transmitted.

### Example

```
::alarm=> new 15 15 10 10
```

## Displaying SDSL Cell Alarm Profiles

From the `::alarm=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<index>]

### Parameter

[<index>]

The SDSL cell alarm profile table index number of the profile you want to display. Omitting this parameter displays the entire SDSL cell alarm profile table.

### Examples

::alarm=> **show 1**

::alarm=> **show**

The following screen shows an example of both show alarm commands.

```
::alarm=> show 1
Index  ThrLOSS    ThrLOCD  ThrSLOCD  ThrSNR
1      15          15       10        10


::alarm=> show
Index  ThrLOSS    ThrLOCD  ThrSLOCD  ThrSNR
1      15          15       10        10
2      15          15       10        10
```

## Deleting SDSL Cell Alarm Profiles

**You cannot delete profiles that are assigned to ports.**

1 From the ::alarm=> prompt, type **show** then press **ENTER** to display the configured SDSL cell alarm profiles.

2 Note the index number of the profile you want to delete.

3 Type the delete command in the following format then press **ENTER**.

**delete** <index>

### Parameter

<index>

The index number of the alarm profile you want to delete.

### Example

::alarm=> **delete 3**

# CONFIGURING SDSL CELL SERVICE

Before configuring an SDSL cell port, make sure you have:

❒ Set up the desired SDSL cell line profile (see “Configuring SDSL Cell Line Profiles” on page 119 for instructions).

❒ Set up the desired SDSL cell alarm profile (see“Configuring SDSL Cell Alarm Profiles” on page 121 for instructions).

You configure SDSL cell channels from the ::cell=> prompt. From the ::root=> prompt, type the following command, then press **ENTER** to display the ::cell=> prompt.

**configuration sdsl cell**

## Adding SDSL Cell Port Configurations

Each SDSL cell port is automatically assigned a default configuration. The default profile index number for each SDSL cell profile type is 1. This procedure describes how to modify the configuration to reflect the desired service.

**1** From the `::cell=>` prompt, type the following command then press **ENTER** to display the `::line=>` prompt.

**`profile line`**

**2** Type **show** then press **ENTER** to display the configured line profiles.

**3** Note the index number of the line profile you want to assign to the channel.

**4** Type the following command then press **ENTER** to display the `::alarm=>` prompt.

**`configuration sdsl cell profile alarm`**

**5** Type show then press **ENTER** to display the configured alarm profiles.

**6** Note the index number of the alarm profile you want to assign to the channel.

**7** Type the following command then press **ENTER** to display the ::cell=> prompt.

**`configuration sdsl cell`**

**8** Type the set command in the following format then press **ENTER**.

```
set <port> <lpindex> <apindex> (up|down)
[-scramble (enable|disable)]
```

### Parameters

`<port>`

The channel slot and port number (format *slot.port*).

`<lpindex>`

The index number of the line profile you want to assign to this channel.

`<apindex>`

The index number of the alarm profile you want to assign to this channel.

**`(up|down)`**

The administrative status of the line: **Up** activates the port. **Down** deactivates the port.

**[-scramble (enable|disable)]**

Enables or disables cell scrambling. Cell scrambling, used in Avidia, is not an ATM defined format for SDSL, but is implemented by many vendors. An ATM cell has two parts: header and payload. Cell scrambling scrambles the payload so that it does not resemble the header. In the event that an ATM network looses sync, it will attempt to synchronize on what it sees as the cell header. In some cases, the cell payload can resemble the cell header, so the network attempts to synchronize on the cell payload rather than the cell header. Scrambling the cell payload precludes it from looking like a cell header. Choose to enable or disable cell scrambling based on whether or not the ATM equipment in the network supports cell scrambling.

### Examples

`::cell=>` **`set 4.2 3 6 up`**

`::cell=>` **`set 4.2 3 6 up -scramble disable`**

## Displaying SDSL Cell Port Configurations

From the `::cell=>` prompt, type the show command in the following format then press **ENTER**.

**`show`** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to display the configuration (format slot.port). Omitting this parameter displays the configurations for all configured SDSL cell channels.

### Examples

`::cell=>` **`show 4.1`**

`::cell=>` **`show`**

The following screen illustrates an example of both show SDSL cell commands.

```
::cell=> show 4.1

Port   Line     Alarm    Admin
       Profile  Profile  Status
4.1     1        1        up

::cell=> show

Port   Line     Alarm    Admin
       Profile  Profile  Status
4.1     1        1        up
4.2     3        7        down
4.3     8        2        up
```

# CONFIGURING IDSL LINE PROFILES

IDSL line profiles contain a preconfigured set of parameters, including the transmit rate, performance monitoring mode, and SES (severely errored second) threshold. IDSL port configuration requires you to apply an IDSL line profile to the line, therefore you must configure the desired IDSL line profile before configuring an IDSL port. A default profile exists with an index of 1. You cannot delete the default profile.

You configure IDSL line profiles from the `::line=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::line=>` prompt.

**`configuration idsl profile line`**

## Adding IDSL Line Profiles

From the `::line=>` prompt, type the new command in the following format then press **ENTER** to create a new IDSL line profile. The profile is automatically assigned the next available index number in the IDSL alarm profile table.

**`new`** `<rate> (`**`path|seg`**`) <SES threshold>`

### Parameters

`<rate>`

The data transfer rate on the IDSL line in kilobits per second (kbps). The valid choices are **64**, **128**, or **144**, with **144** as the default.

(**path**|**seg**)

The performance monitoring mode, which determines how IDSL current performance data (see "Monitoring IDSL Current Performance" on page 274) and diagnostic data (see "Managing IDSL Diagnostics" on page 348) are collected.

**path**—Statistics are reported for each segment of the connection path (loop) cumulatively. In the customer direction, node 0 (Avidia system) reports statistics for the first segment, node 1 reports statistics for the first and second segments, etc. In the network direction, node 0 (Avidia system) reports statistics for all the segments, node 1 reports statistics for all but the first segment, and so on.

**seg** (segmented)—Statistics are reported for each segment of the connection path (loop). In both the customer and network directions, node 0 (Avidia system) reports statistics for the first segment, node 1 reports statistics for the second segment, and so on.

`<SES threshold>`

The number of block errors required for defining a severely errored second. The range is 1 to 15, with 3 as the default. A block error is generated any time there is a CRC violation detected on an IDSL superframe.

### Example

```
::line=> new 128 path 4
```

## Displaying IDSL Line Profiles

From the `::line=>` prompt, type the show command in the following format then press **ENTER**.

```
show [<index>]
```

### Parameter

`[<index>]`

The IDSL line profile table index number of the profile you want to display. Omitting this parameter displays the entire IDSL line profile table.

### Examples

```
::line=> show 1
```

```
::line=> show
```

The following screen illustrates an example of both show line commands.

```
::line=> show 1

                PM         Rate              SES
Index         Mode       (kbps)           Threshold
    1    Segmented        144                3

::line=> show

                PM         Rate              SES
Index         Mode       (kbps)           Threshold
    1    Segmented        144                3
    2         Path        144                3
    3         Path        128                3
```

| Information | Description |
|---|---|
| Index | The index number of the line profile. |
| PM Mode | The performance monitoring mode, which determines how IDSL current performance data and diagnostic data are collected (Path or Segmented). |
| Rate (kbps) | The data transfer rate on the IDSL line (64, 128, or 144). |
| SES Threshold | The number of block errors required for defining a severely errored second. |

## Deleting IDSL Line Profiles

**You cannot delete profiles that are assigned to ports. You cannot delete the default profile.**

1. From the `::line=>` prompt, type **show** then press **ENTER** to display the IDSL line profile table.
2. Note the index number of the IDSL line profile you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **delete** <index>

#### Parameter

`<index>`

The index number of the IDSL line profile you want to delete.

#### Example

`::line=>` **`delete 2`**

# CONFIGURING IDSL ALARM PROFILES

IDSL alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). IDSL port configuration requires you to apply an IDSL alarm profile to the line, therefore you must configure the desired IDSL alarm profile before configuring an IDSL port. A default profile exists with an index of 1. You cannot delete the default profile.

You configure IDSL alarm profiles from the `::alarm=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::alarm=>` prompt.

**`configuration idsl profile alarm`**

## Adding IDSL Alarm Profiles

From the `::alarm=>` prompt, type the new command in the following format then press **ENTER** to create a new IDSL alarm profile.

**`new`** `<hourly ES> <hourly SES> <daily ES> <daily SES>`

#### Parameters

`<hourly ES>`

The hourly ES threshold is the number of errored seconds that must be met or exceeded on the IDSL line within an hour for a trap to occur. The range is 0 (disable) to 255, with 40 as the default.

An errored second generates when one or more block errors (CRC violations) are detected during a one second interval.

`<hourly SES>`

The hourly SES threshold is the number of severely errored seconds that must be met or exceeded on the IDSL line within an hour for a trap to occur. The range is 0 (disable) to 127, with 10 as the default.

A severely errored second generates when the number of block errors (CRC violations) defined by the SES threshold parameter (see “Adding IDSL Line Profiles” on page 127) are detected during a one second interval.

`<daily ES>`

The daily ES threshold is the number of errored seconds that must be met or exceeded on the IDSL line within a day for a trap to occur. The range is 0 (disable) to 4095, with 100 as the default.

An errored second generates when one or more block errors (CRC violations) are detected during a one second interval.

`<daily SES>`

The daily SES threshold is the number of severely errored seconds that must be met or exceeded on the IDSL line within a day for a trap to occur. The range is 0 (disable) to 2047, with 25 as the default.

A severely errored second generates when the number of block errors (CRC violations) defined by the SES threshold parameter (see “Adding IDSL Line Profiles” on page 127) are detected during a one second interval.

### Example

```
::alarm=> new 50 10 125 25
```

## Displaying IDSL Alarm Profiles

From the `::alarm=>` prompt, type the show command in the following format then press **ENTER**.

```
show [<index>]
```

### Parameter

`[<index>]`

The IDSL alarm profile table index number of the profile you want to display. Omitting this parameter displays the entire IDSL alarm profile table.

### Examples

`::alarm=>` **`show 1`**

`::alarm=>` **`show`**

The following screen shows an example of both show alarm commands.

```
::alarm=> show 1

             Hourly       Hourly        Daily        Daily
Index          ES          SES           ES          SES
    1          40           10          100           25


::alarm=> show

             Hourly       Hourly        Daily        Daily
Index          ES          SES           ES          SES
    1          40           10          100           25
    2          40           15          100           30
    3          50           10          125           25
```

| Information | Description |
|---|---|
| Index | The index number of the alarm profile. |
| Hourly ES | The number of errored seconds that must be met or exceeded on the IDSL line within an hour for a trap to occur. The range is 0 (disable) to 255. |
| Hourly SES | The number of severely errored seconds that must be met or exceeded on the IDSL line within an hour for a trap to occur. The range is 0 (disable) to 127. |
| Daily ES | The daily ES threshold is the number of errored seconds that must be met or exceeded on the IDSL line within a day for a trap to occur. The range is 0 (disable) to 4095. |
| Daily SES | The number of severely errored seconds that must be met or exceeded on the IDSL line within a day for a trap to occur. The range is 0 (disable) to 2047. |

## Deleting IDSL Alarm Profiles

**You cannot delete profiles that are assigned to ports. You cannot delete the default profile.**

1. From the `::alarm=>` prompt, type **`show`** then press **ENTER** to display the configured IDSL alarm profiles.
2. Note the index number of the profile you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   ```
   delete <index>
   ```

#### Parameter

`<index>`

The index number of the alarm profile you want to delete.

#### Example

```
::alarm=> delete 3
```

# CONFIGURING IDSL SERVICE

You assign IDSL service for the card by specifying the transmit clock source and for each port by specifying a line profile and alarm profile. Before configuring an IDSL port, make sure you have:

- ❐ Set up the desired IDSL line profile (see “Configuring IDSL Line Profiles” on page 127 for instructions).
- ❐ Set up the desired IDSL alarm profile (see“Configuring IDSL Alarm Profiles” on page 130 for instructions).

## Modifying the IDSL Transmit Clock Source

You modify the source of the transmit clock for the IDSL card from the `::clock=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::clock=>` prompt.

**`configuration IDSL clock`**

Type the set command in the following format then press **ENTER**.

**`set`** `<slot> (`**`local|A|B`**`)`

#### Parameters

`<slot>`

The slot number of the IDSL card.

`(`**`local|A|B`**`)`

The transmit clock source for the IDSL card. The default is **`local`**.

**`local`**—The IDSL clock is the source.

**A**—The Avidia system reference clock on channel A is the source.

**B**—The Avidia system reference clock on channel B is the source.

#### Example

`::clock=>` **`set 5 local`**

## Displaying the IDSL Transmit Clock Source

From the `::clock=>` prompt, type the show command in the following format then press **ENTER**.

**`show`** `<slot>`

#### Parameter

`<slot>`

The slot for which you want to display the clock source.

### Example

`::clock=>` **`show 5`**

The following screen illustrates an example of the show clock command.

```
::clock=> show 5

IDSL clock source for slot 5: local
```

## Modifying IDSL Port Configurations

Each IDSL port is automatically assigned a default configuration. This procedure describes how to modify the configuration to reflect the desired service.

**1** You configure IDSL ports from the `::idsl=>` prompt. From the `::root=>` prompt, type the following command then press ENTER to display the `::idsl=>` prompt.

**`configuration idsl`**

**2** From the `::idsl=>` prompt, type the following command then press ENTER to display the `::line=>` prompt.

**`profile line`**

**3** Type **`show`** then press ENTER to display the configured line profiles.

**4** Note the index number of the line profile you want to assign to the channel.

**5** Type the following command then press ENTER to display the `::alarm=>` prompt.

**`configuration idsl profile alarm`**

**6** Type **`show`** then press ENTER to display the configured alarm profiles.

**7** Note the index number of the alarm profile you want to assign to the channel.

**8** Type the following command then press ENTER to display the `::idsl=>` prompt.

**`configuration idsl`**

**9** Type the set command in the following format then press ENTER.

**`set`** `<port> <lpindex> <apindex> (`**`up|down`**`) [<circuit id>]`

### Parameters

`<port>`

The channel slot and port number (format *slot.port*).

`<lpindex>`

The index number of the line profile you want to assign to this port.

`<apindex>`

The index number of the alarm profile you want to assign to this port.

(**up**|**down**)

The administrative status of the line. **Up** activates the port. **Down** deactivates the port.

`[<circuit id>]`

A text string of up to 255 characters that serves as a unique identifier for the IDSL circuit.

### Example

::idsl=> **set 4.2 3 6 up “idsl circuit #7”**

## Displaying IDSL Port Configurations

From the `::idsl=>` prompt, type the show command in the following format then press **ENTER**.

**show** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to display the configuration (format *slot.port*). Omitting this parameter displays the configurations for all configured IDSL channels.

### Examples

`::idsl=>` **`show 4.1`**

`::idsl=>` **`show`**

The following screen illustrates an example of both show idsl commands.

```
::idsl=> show 4.1
                Line          Alarm           Admin
Port            Profile       Profile         Status

4.1             1             1               up


::idsl=> show
                Line          Alarm           Admin
Port            Profile       Profile         Status

4.1             1             1               up
4.2             2             4               down
```

| Information | Description |
|---|---|
| Port | The slot number and port number for which IDSL port configurations are displayed. |
| Line Profile | The index number of the line profile assigned to this port. |
| Alarm Profile | The index number of the alarm profile assigned to this port. |
| Admin Status | The administrative status of the line (up or down). |

# CONFIGURING XDSL SUBSCRIBER NAMES

You can assign a subscriber name to each xDSL port. You configure xDSL subscriber names from the `::service=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::service=>` prompt.

**`configuration atm frame service`**

## Adding New xDSL Subscriber Names

From the `::service=>` prompt, type the new command in the following format then press **ENTER**.

`new <port> (<name>|"<name with spaces>")`

### Parameter

`<port>`

The port for which you want to assign a subscriber name (format *slot.port*).

`(<name>|"<name with spaces>")`

<name>

The `name` text string can contain any characters and can be any length. However, if you include quotation marks in the `name` text string, the quotation marks must be preceded by a backward slash (\). You can use multiple words separated by an underscore.

`<name with spaces>`

The `name with spaces` text string can contain any characters and be any length. You can use multiple words separated by spaces. If you include quotation marks in the `name with spaces` text string, the quotation marks must be preceded by a backward slash (\).

### Examples

```
::service=> new 4.1 Company_A
::service=> new 4.1 "Company A"
```

## Deleting Subscriber Names

From the `::service=>` prompt, type the delete command in the following format then press **ENTER**.

**delete** <port>

### Parameter

<port>

The port for which you want to delete a subscriber name (format *slot.port*).

### Example

::service=> **delete 4.1**

## Displaying Subscriber Names

From the `::service=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<port>]

### Parameter

<port>

The port for which you want to display a subscriber name (format *slot.port*). Omitting this parameter displays the configured subscriber names for all SDSL ports.

The following screen illustrates an example of both show service commands. All frame channel card ports are automatically configured for Transparent LAN Service (TLS).

```
::service=> show
Port     Subscriber_Name    Service_Type

4.1      Company A          TLS
4.2      Company B          TLS

::service=> show 4.1
4.1      Company A          TLS
```

# CONFIGURING NETWORK SERVICES 7

This chapter describes how to set up network-side services by configuring line card ports through the command-line interface.

# CONFIGURING OC3 SERVICE

You must configure each line card port to reflect whether the physical interface is SONET or SDH. You configure the line card port from the `::optics=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::optics=>` prompt.

**`configuration optics`**

## Configuring the OC3 Interface Type

Each OC3 card has two SONET ports, designated as ports 1a and 1b. You must set the interface type for each port separately. From the `::optics=>` prompt, type the set command in the following format then press **ENTER**.

```
set <port> [-loopback (none|local|line)]
[-scrambling (enable|disable)]
```

### Parameters

`<port>`

The line card port you want to configure (format *slot*.*port*, where port is either **1** or **2**).

`[-loopback (none|local|line)]`

The type of loopback to start, if any. See "Initiating Communication Path Loopbacks" on page 345 for information.

`[-scrambling (enable|disable)]`

Enables or disables cell scrambling. Cell scrambling, used in Avidia, is not an ATM defined format for OC3, but is implemented by many vendors. An ATM cell has two parts: header and payload. Cell scrambling scrambles the payload so that it does not resemble the header. In the event that an ATM network looses sync, it will attempt to synchronize on what it sees as the cell header. In some cases, the cell payload can resemble the cell header, so the network attempts to synchronize on the cell payload rather than the cell header. Scrambling the cell payload precludes it from looking like a cell header. Choose to enable or disable cell scrambling based on whether or not the ATM equipment in the network supports cell scrambling.

### Example

```
::optics=> set 2.1 -scrambling enable
```

## Displaying the Configured OC3 Interface Type

From the `::optics=>` prompt, type **show** then press **ENTER**. A screen similar to the following displays.

```
::optics=> show

*****     THE OC3 CONFIGURATION TABLE FOR PORT 2.1     *****
            Loopback Configuration:       None
                  Cell Scrambling :       Enabled


*****     THE OC3 CONFIGURATION TABLE FOR PORT 2.2     *****
            Loopback Configuration:       None
                  Cell Scrambling :       Enabled
```

# CONFIGURING DS1 SERVICE

This section contains instructions for configuring service for DS1 line cards installed in either an Avidia 8000 or an Avidia 3000. To configure a DS1 line/management combination card installed in an Avidia 2200, you must first subtend the Avidia 2200 to an Avidia 8000 or an Avidia 3000 using the command-line interface (See “Subtending Multiple Systems” on page 45 and “Setting Up Connections” on page 70 for more information). Then, use in-band management or the command-line interface to configure DS1 service on the DS1 line/management card.

You configure DS1/T1 channels from the `::ds1=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::ds1=>` prompt.

**configuration ds1**

## Configuring DS1 Ports

From the `::ds1=>` prompt, type the set command in the following format then press **ENTER**.

**set** <port> [**-type** (**esf|d4**) [**-coding** (**b8zs|ami**)]
[**-clock** (**loop|local**)] [**-lbo** index] [**-trap** (**enabled|disabled**)]
[**-admin** (**up|down**)]
[**-id** (<circuit identifier>|**"**<circuit identifier with spaces>**"**)]
[**-loopback** (**none|local|line|payload|remote**)]
[**-scrambling** (**enable|disable**)]

### Parameters

<port>

The channel slot and port number (format *slot.port*).

[**-type** (**esf|d4**)]

The type of DS1 line, either Extended Superframe or AT&T D4). Type **-type esf** or **-type d4**.

[**-coding** (**b8zs|ami**)]

The type of coding on the line. Type **-coding b8zs** or **-coding ami**.

[**-clock** (**loop|local**)]

The type of clocking, either loop timing or local timing. Type **-clock loop** or **-clock local**.

**[-lbo** index]

The line build out, in feet. Determine the value for `<index>`, based on the length of the line (for DSX1) or equalization (for DS1), as follows:

| Index | Line Build Out/Equalization | Line Type |
|---|---|---|
| 0 | 0 dB | DS1 |
| 1 | -7.5 dB | DS1 |
| 2 | -15 dB | DS1 |
| 3 | -22.5 dB | DS1 |
| 4 | 0 to 133 feet (0 to 40 meters) | DSX1 |
| 5 | 133 to 266 feet (40 to 81 meters) | DSX1 |
| 6 | 266 to 399 feet (81 to 121 meters) | DSX1 |
| 7 | 399 to 533 feet (121 to 162 meters) | DSX1 |
| 8 | 533 to 655 feet (162 to 200 meters) | DSX1 |

[**-trap** (**enabled**|**disabled**)]

Enables or disables DS1 trap generation. Type **-trap enabled** or **-trap disabled**.

[**-admin** (**up**|**down**)]

Specifies the administrative status of the line. Type **-admin up** to activate the line. Type **-admin down** to deactivate it.

[**-id** <circuit identifier>|"<circuit identifier with spaces>"]

A text string that identifies the circuit.

<circuit identifier>

The circuit identifier text string can contain any characters and can be any length. However, if you include quotation marks in the name text string, the quotation marks must be preceded by a backward slash (\). You can use multiple words separated by an underscore.

<circuit identifier with spaces>

The circuit identifier with spaces text string can contain any characters and be any length. You can use multiple words separated by spaces. If you include quotation marks in the circuit identifier with spaces text string, the quotation marks must be preceded by a backward slash (\).

**[-loopback (none|local|line|payload|remote)]**

The type of loopback to start, if any. See "Initiating Communication Path Loopbacks" on page 345 for information.

**[-scrambling (enable|disable)]**

Enables or disables cell scrambling. Cell scrambling, used in Avidia, is not an ATM defined format for DS1, but is implemented by many vendors. An ATM cell has two parts: header and payload. Cell scrambling scrambles the payload so that it does not resemble the header. In the event that an ATM network looses sync, it will attempt to synchronize on what it sees as the cell header. In some cases, the cell payload can resemble the cell header, so the network attempts to synchronize on the cell payload rather than the cell header. Scrambling the cell payload precludes it from looking like a cell header. Choose to enable or disable cell scrambling based on whether or not the ATM equipment in the network supports cell scrambling.

### Example

```
::ds1=> set 2.1 -type esf -coding ami -clock local -lbo 1 -trap
enabled -admin up -id company_a -scrambling enable
```

## Displaying DS1/T1 Port Configurations

From the `::ds1=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<port>]

### Parameter

[<port>]

The port for which you want to display the configuration (format *slot.port*). Omitting this parameter displays the configurations for all configured DS1/T1 channels.

### Examples

::ds1=> **show 4.1**

::ds1=> **show**

The following screen illustrates an example of a show ds1 command.

```
::ds1=> show 4.1

           THE DS1 CONFIGURATION TABLE FOR PORT 4.1

*****     THE DS1 CONFIGURATION TABLE FOR PORT 11.1     *****
                Circuit Identifier:
                  LBO/Equalization:       enable(1)
                         Line Code:       B8ZS
                           Framing:       ESF
             Transmit Clock Source:       Local timing
                      Elapsed Time:       793
                   Valid Intervals:       96
                 Invalid Intervals:       0
           Line Status Last Change:       Fri, Aug 18 2000 11:26:18
                         Send Code:       Sending looped or normal data
              Facilities Data Link:       FdlNone
                  Loop Back Status:       None
                      Admin Status:       Up
    Line Status Change Trap Enable:       Enabled
                   Cell Scrambling:       705
```

The DS1 Configuration Table displays the following information.

| Information | Descriptions |
|---|---|
| Time Elapsed | The number of seconds that have elapsed since the current 15-minute data collection period began. |
| Valid Intervals | The number of 15-minute data collection intervals for which data is collected. The Avidia system supports 96 intervals, or 24 hours, of data collection. |
| Line Type | The type of DS1 line (Extended Superframe or AT&T D4). |
| Line Coding | The type of coding on the line (B8ZS or AMI). |
| Send Code | The type of data currently being transmitted. Currently, the only data type supported is Sending Looped or Normal Data. |
| Circuit Identifier | A text string that identifies the circuit. |
| Loopback Configuration | The type of loopback in effect. Currently, loopbacks are not supported, therefore Not in the Loopback State displays. |
| Line Status | The status of the line interface. Options:<br>• dsx1NoAlarm—No alarm is present.<br>• dsx1RcvFarEndLOF—Remote loss of frame alarm.<br>• dsx1RcvAIS—Remote AIS.<br>• dsx1LossOfFrame—Local loss of frame alarm.<br>• dsx1LossOfSignal—Local loss of signal alarm. |
| Signal Mode | The type of signalling in effect. Currently, signalling is not supported, therefore None displays. |
| Transmit Clock Source | The type of timing in use (Loop timing or Local timing). |
| Facilities Data Link | This parameter is not currently supported, therefore dsx1FdlNone displays. Facilities Data Link is a protocol that enables communication with the remote device when in ESF mode. |
| Invalid Intervals | The Avidia system does not have invalid intervals, therefore 0 displays. |
| Line Build Out | For a DSX1 line, the length of the line, in feet. For a DS1 line, the line equalization, in dB. |
| Last Line Status Change | The time at which the line entered its current status (see the Line Status description above for a definition of line status). |
| Loop Back Status | Loopbacks are not yet supported, therefore dsx1NoLoopback displays. |
| DS1 Channel Number | Channelization is not yet supported, therefore 0 displays. |
| Channelization | This feature is currently disabled, therefore Disabled displays. |
| Admin Status | The configured admin status of the line, either Up or Down. |

# CONFIGURING DS3 SERVICE

You configure DS3 service from the `::ds3=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::ds3=>` prompt.

**`configuration ds3`**

## Configuring DS3 Ports

From the `::ds3=>` prompt, type the set command in the following format then press **ENTER**.

```
set <port> [-clock (loop|local)] [-lbo index] [-type (m23|cbit)]
[-mode (direct|plcp)] [-loopback (none|local|line|remote)]
[-scrambling (enable|disable)]
```

### Parameters

`<port>`

The channel slot and port number (format *slot.port*).

`[-clock (loop|local)]`

The type of clocking, either loop or local timing. Type **`-clock loop`** or **`-clock local`**.

`[-lbo index]`

The line build out, in feet. Determine the value for `<index>`, based on the length of the line, as follows:

| Index | Line Build Out |
|---|---|
| 0 | 0 to 225 feet (68.5 meters) |
| 1 | More than 225 feet |

`[-type (m23|cbit)]`

The type of DS3 line. Type **`-type m23`** or **`-type cbit`**. The cbit line type is not currently supported.

**[-mode (direct|plcp)]**

The ATM mapping setting, which sets how ATM cells map to DS3 frames. Type the option that is compatible with your DS3 network, either **`-mode direct`** to directly map ATM cells to DS3 frames, or **`-mode plcp`** to use the ATM Physical Layer Convergence Protocol (PLCP).

**[-loopback (none|local|line|remote)]**

The type of loopback to start, if any. See "Initiating Communication Path Loopbacks" on page 345 for information.

**[-scrambling (enable|disable)]**

Enables or disables cell scrambling. Cell scrambling, used in Avidia, is not an ATM defined format for DS3, but is implemented by many vendors. An ATM cell has two parts: header and payload. Cell scrambling scrambles the payload so that it does not resemble the header. In the event that an ATM network looses sync, it will attempt to synchronize on what it sees as the cell header. In some cases, the cell payload can resemble the cell header, so the network attempts to synchronize on the cell payload rather than the cell header. Scrambling the cell payload precludes it from looking like a cell header. Choose to enable or disable cell scrambling based on whether or not the ATM equipment in the network supports cell scrambling.

### Example

```
::ds3=> set 12.1 -clock local -lbo 0 -type cbit -mode direct
-loopback none -scrambling enable
```

## Displaying DS3 Port Configurations

From the `::ds3=>` prompt, type the show command in the following format then press **ENTER**.

**show** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to display the configuration (format *slot.port*). Omitting this parameter displays the configurations for all configured DS3 channels.

### Examples

`::ds3=>` **`show 4.1`**

`::ds3=>` **`show`**

The following screen illustrates an example of a show ds3 command.

```
::ds3=> show 12.1

          THE DS3 CONFIGURATION TABLE FOR PORT 12.1

                     Time Elapsed:       3213
                  Valid Intervals:       96
                        Line Type:       CbitParity
                      Line Coding:       B3ZS
                        Send Code:       SendNoCode
               Circuit Identifier:
                 Cell Scrambling :       Enabled
                    Framing Mode :       Direct
                      Line Status:       LOS
            Transmit Clock Source:       localTiming
                Invalid Intervals:       0
                              LBO:       0 to 225 feet
          Line Status Last Change:       Wed, Dec 06 2000 11:19:19
   Line Status Change Trap Enable:       Enabled
                 Loop Back Status:       NoLoopback
                   Channelization:       disabled
              Ds1 For Remote Loop:       1
                     Admin Status:       Up
```

| Information | Descriptions |
|---|---|
| Time Elapsed | The number of seconds that have elapsed since the current 15-minute data collection period began. |
| Valid Intervals | The number of 15-minute data collection intervals for which data is collected. The Avidia system supports 96 intervals, or 24 hours, of data collection. |
| Line Type | The type of DS3 line. Options:<br>• dsx3m23<br>• dsx3CbitParity (this line type is not currently supported) |
| Line Coding | The type of coding on the line. B3ZS is the only line type currently supported. |
| Send Code | The type of data currently being transmitted. Currently, only SendNoCode is supported, indicating that the line is sending looped or normal data. |

| Information | Descriptions |
|---|---|
| Circuit Identifier | A text string that identifies the circuit. This feature is not yet supported. |
| Cell Scrambling | Indicates whether cell scrambling is enabled or disabled. |
| Framing Mode | The mode used to map ATM cells to frames. Options:<br>• direct—maps cells directly<br>• plcp—uses the ATM Physical Layer Convergence Protocol (PLCP) |
| Line Status | The status of the line interface. Options:<br>• dsx3NoAlarm—No alarms are present.<br>• dsx3RcvRAIFailure—Receiving a remote alarm indication.<br>• dsx3XmitRAIAlarm—Transmitting a remote alarm indication.<br>• dsx3RcvAIS—Receiving an AIS.<br>• dsx3XmitAIS—Transmitting an AIS.<br>• dsx3LOF—Receiving a loss-of-frame error.<br>• dsx3LOS—Receiving a loss-of-signal error. |
| Transmit Clock Source | The type of timing in use. Options:<br>• LoopTiming<br>• LocalTiming |
| Invalid Intervals | The Avidia system does not have invalid intervals, therefore **0** displays. |
| LBO | The length of the line. Options:<br>• 0 to 225 feet (69 m)<br>• More than 225 feet |
| Last Line Status Change | The time and date of the last line status change. |
| Line Status Change Trap Enable | Indicates whether DS3 trap generation is enabled or disabled. |
| Loop Back Status | Loopbacks are not yet supported, therefore dsx3NoLoopback displays. |
| Channelization | This feature is currently disabled, therefore Disabled displays. |
| DS1 For Remote Loop | Indicates which DS1 will be looped back. A value of 0 means no DS1 will be looped. A value of 29 means all DS1s will be looped. |
| Admin Status | The configured admin status of the line, either Up or Down. |

# CONFIGURING ATM VIRTUAL CIRCUITS 8

This chapter describes how to establish connections between ports across the Avidia chassis through the command-line interface.

# CONFIGURING ATM TRAFFIC PROFILES

ATM traffic profiles are preconfigured combinations of traffic descriptors and related parameters, which define the traffic quality of service (QoS) contract. See “ATM Traffic Configuration” on page 20 for an explanation of the traffic types and their related parameters. You assign traffic profiles to both upstream and downstream traffic during PVPC and PVCC configuration. Therefore, you must configure the desired ATM traffic profiles before configuring ATM service on a particular port.

The following table summarizes the supported cell transfer rates for each Avidia line and channel card. Use this table to make sure the peak cell rate and sustainable cell rates you specify during ATM traffic profile configuration are valid. Remember that, while the OC3 line card supports up to 353,301 cells per second, the configured transfer rates must be supported from end-to-end. Therefore the configured transfer rate cannot exceed the rate supported by the channel card used in the circuit.

| Card Type | Upstream Cell Transfer Rates Supported | Downstream Cell Transfer Rates Supported |
|---|---|---|
| OC3 line card | 0–353,301 cells per second (149.8 Mbps) | 0–353,301 cells per second (149.8 Mbps) |
| DS3 line card | 0–105,509 cells per second (44.736 Mbps) | 0–105,509 cells per second (44.736 Mbps) |
| DSX-1 line card | 0–3,622 cells per second (1.536 Mbps) | 0–3,622 cells per second (1.536 Mbps) |
| T1 channel card | 0–3,622 cells per second (1.536 Mbps) | 0–3,622 cells per second (1.536 Mbps) |
| Cell-based ADSL channel card | 150–2,189 cells per second (64 - 928 kbps) | 64–17,689 cells per second (64 - 7.5 Mbps) |
| Frame-based SDSL channel card | 150–4,830 cells per second (64 - 2,048 kbps) | 150–4,830 cells per second (64 - 2,048 kbps) |

**When setting up ATM traffic profiles, you need to specify the peak cell rate in cells per second. To convert bits per second to cells per second, divide the number of bits per second by 8, then divide the result by 53.**

You configure ATM traffic profiles from the `::traffic=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::traffic=>` prompt.

```
configuration atm traffic
```

## Adding ATM Traffic Profiles

The ATM Traffic Profiles are stored in an ATM Traffic Descriptor Table. Each profile has an index number assigned to it. You use the index number to assign a profile to a PVPC or PVCC.

1 From the `::traffic=>` prompt, type **`show`** then press ENTER to view the ATM Traffic Descriptor Table.

2 Note the next available index number.

3 Type the new command in the following format then press ENTER.

**`new`** `<index> <type>`

### Parameters

`<index>`

The ATM Traffic Descriptor Table index number you want to associate with the configuration.

`<type>`

One of the following supported traffic descriptors with associated parameters:

- **`ubr`** `[<pcr01>][<CDVT>]`
- **`cbr`** `<pcr01> <CDVT> <MaxCTD> <CLR>`
- **`nrt-VBR`** `<PCR01> <CDVT> <MaxCTD> <CLR> <SCR01> <MBS>`
- **`rt-VBR`** `<PCR01> <CDVT> <MaxCTD> <CLR> <SCR01> <MBS>`

`<pcr01>`

The desired peak cell rate, in cells per second, to be applied to all cells regardless of the CLP tagging. This parameter is optional for ubr traffic. The valid range is 150-353207.

`<CDVT>`

The maximum allowable Cell Delay Variation Tolerance, or delay between consecutive ATM cells, in cells per second. The valid range is 150-180000. The default is 1500.

`<MaxCTD>`

The maximum Cell Transfer Delay, or elapsed time between the transmission of a cell and the receipt of that cell at its destination, in microseconds. The valid range is 20 - 1000.

`<CLR>`

The maximum Cell Loss Ratio, or number of lost cells divided by the total number of transmitted cells. This value is represented as $10^{-n}$, where $n$ is the required input for this parameter. The valid range is 5 - 12.

`<SCR01>`

The desired sustained cell rate (minimum guaranteed transmission rate), in cells per second, to be applied to all cells regardless of the CLP tagging. The valid range is 150-353,206.

`<MBS>`

The Maximum Cell Transfer Delay, or elapsed time between the transmission of a cell and the receipt of that cell at its destination, in microseconds. The valid range is 1-65536

### Examples

::traffic=> **new 5 ubr**

::traffic=> **new 6 ubr 5000**

## Displaying ATM Traffic Profiles

From the `::traffic=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<index>]

### Parameter

[<index>]

The index number of the ATM traffic profile you want to display. Omitting this parameter displays the entire ATM Traffic Descriptor Table.

### Examples

::traffic=> **show 2**

::traffic=> **show**

The following screen illustrates an example of both show traffic commands.

```
::traffic=> show

Index TYPE                                      PCR01 SCR01 MBS01 CDVT MaxCDT CLR
0     UBR: NoTrafficDescriptor
1     CBR: CLPTransparentNoScr                  2000              1500 500    10

::traffic=> show 1

Index TYPE                                      PCR01 SCR01 MBS01 CDVT MaxCDT CLR
1     CBR: CLPTransparentNoScr                  2000              1500 500    10
```

## Deleting ATM Traffic Profiles

1. From the `::traffic=>` prompt, type **show** then press ENTER to display the configured traffic profiles.
2. Note the index number of the profile you want to delete.
3. Type the delete command in the following format then press ENTER.

   **delete** <index>

### Parameter

<index>

The ATM Traffic Descriptor Table index number of the entry you want to delete.

### Example

::traffic=> **delete 2**

# CONFIGURING APS

Avidia systems use Automatic Protection Switching (APS) to switch ATM traffic from the main SONET channel (the working channel) to a secondary SONET channel (the protection channel) when a failure occurs. This redundancy enables service to continue despite failures on the working SONET channel. See "Automatic Protection Switching" on page 33 for an explanation of how APS works.

You configure APS from the `::aps=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::aps=>` prompt:

**`configuration aps`**

## Configuring APS

From the `::aps=>` prompt type the set command in the following format, then press **ENTER**.

```
set <slot> [-enable (on|off)] [-mode (autonorev|norev|rev)]
[-wtr <secs>] [-trapenable (on|off)]
```

### Parameters

`<slot>`

The slot number containing the OC3 card for which you want to configure APS.

`[-enable (on|off)]`

Enables or disables APS. Type **`-enable on`** to enable APS. Type **`-enable off`** to disable APS.

`[-mode (autonorev|norev|rev)]`

Sets the APS mode.

- **`autonorev`** (non revertive auto switch)—once traffic has switched to the protection channel it will automatically switch back to the working channel when the system detects an error on the protection channel and the failure on the working channel has been cleared.
- **`norev`** (non revertive manual)—once traffic has switched to the protection channel it will not automatically switch back to the working channel when the failure on that channel has been cleared (this is the default).
- **`rev`** (revertive)—once traffic has switched to the protection channel, it will automatically switch back to the working channel when the failure on the working channel has been cleared for a user-specified amount of time.

[**-wtr** <secs>]

Omit this parameter if you selected the **autonorev** or **norev** for the APS mode. When the APS is set to **rev**, the Wait To Revert (WTR) timer specifies the number of seconds that you want the system to wait before switching traffic from the protection channel back to the working channel after a failure on the main channel has been cleared. The range is 300 to 720 seconds. The default is 300 seconds.

[**-trapenable** (**on**|**off**)]

Determines whether APS trap generation is enabled or disabled. Type **-trapenable on** to enable APS trap generation. Type **-trapenable off** to disable APS trap generation.

### Example

::aps=> **set 2 -enable on -mode rev -wtr 300 -trapenable on**

## Issuing Manual APS Commands

Once APS is enabled, you can issue manual commands to override the configured APS operation. After issuing a manual APS command, you must issue a clear command to resume the configured APS operation. From the ::aps=> prompt type the following command, then press **ENTER**.

**command** <slot> <(**prot2workready**|**prot2work**|**work2prot**|
**lockout**|**clear**)>

### Parameters

`<slot>`

The slot number containing the OC3 card for which you want to issue a manual APS command.

<(**prot2workready|prot2work|work2prot|lockout|clear**>

The command you want to issue.

- **prot2workready**—switches traffic to the working channel if there are not other conditions (such as the configured Wait To Revert Time or a failure condition) that prohibit switching to that channel.
- **prot2work**—switches the traffic to the working channel.
- **work2prot**—switches the traffic to the protection channel.
- **lockout**—disables APS.
- **clear**—clears any of the previous APS commands and resumes the configured APS operation.

### Example

```
::aps=> command 2 prot2work
```

## Displaying APS Configuration

To verify your APS configuration, from the `::aps=>` prompt, type the **show** command as follows then press ENTER.

**show** [<slot>]

### Parameter

[<slot>]

The slot number for which you want to display the APS configuration. Omitting this parameter displays the APS configuration for all slots.

### Examples

::aps=> **show**

::aps=> **show 12**

A screen similar to the following displays.

```
::aps=> show

Slot    Enable          Mode                     WTR          Command       TrapEn
12      enable(1)       nonRevertiveAuto(2)      300          none          enable(1)
```

| Information | Description |
|---|---|
| Slot | The slot for which the APS configuration is displayed. |
| Enable | Whether APS is enabled or disabled for the slot. |
| Mode | The configured APS mode Options:<br>• **autonorev** (non revertive auto switch)—once traffic has switched to the protection channel it will automatically switch back to the working channel when the system detects an error on the protection channel and the failure on the working channel has been cleared.<br>• **norev** (non revertive manual)—once traffic has switched to the protection channel it will not automatically switch back to the working channel when the failure on that channel has been cleared (this is the default).<br>• **rev** (revertive)—once traffic has switched to the protection channel, it will automatically switch back to the working channel when the failure on the working channel has been cleared for a user-specified amount of time. |
| WTR | When the APS is set to rev, this parameter specifies the number of seconds the system waits before switching traffic from the protection channel back to the working channel after a failure on the main channel has been cleared. The range is 300 to 720 seconds. The default is 300 seconds. |
| Command | Which, if any, manual APS commands are in effect. |
| TrapEn | Whether APS trap generation is enabled or disabled. |

# CONFIGURING PVPCS

Configure primary PVPCs and backup PVPCs using the command-line interface. Backup PVPCs are redundant to primary PVPCs. A primary PVPC automatically switches to a backup PVPC if the primary PVPC were to fail.

PVPCs carry data between defined points within the Avidia chassis, such as between a cell-based channel card and a line card. PVPCs also carry data from subscriber modems to Avidia channel cards, and from Avidia line cards to other destinations in the ATM backbone network.

PVPC configuration requires specifying a Virtual Path Identifier (VPI). For PVPCs, the system only translates the VPI value and does not check or change any configured Virtual Channel Identifier (VCI) value.

## Viewing ATM Port Settings

You cannot currently configure ATM port settings, however you can display the preconfigured ATM settings for the OC3 line card, which may be useful when configuring virtual circuits. From the `::root=>` prompt, type the following command then press **ENTER** to display the ATM port settings.

**`configuration atm show`**

A screen similar to the following displays.

```
::atm=> show

slot  MaxPVPs  MaxPVCs  PVPCs  PVCCs  MaxVPIBits  MaxVCIBits
12    255      4064     1      0      12          9
```

The following table describes the information displayed after you type the atm show command:

| Information | Description |
|---|---|
| Slot | The slot number of the ATM port for which the information is displayed. |
| MaxPVPCs | The maximum number of PVPCs that can be configured on the selected port. |
| MaxPVCCs | The maximum number of PVCCs that can be configured on the selected port. |
| PVPCs | The current number of PVPCs configured on the selected port. |
| PVCCs | The current number of PVCCs configured on the selected port. |
| MaxVPIBits | The number of VPI bits in each cell header that are used by the Avidia system. |
| MaxVCIBits | The number of VCI bits in each cell header that are used by the Avidia system. |

## Configuring Cell Channel Card PVPCs

You can configure cross-connect PVPCs between ATM ports on cell-based channel cards and ATM ports on line cards. You configure PVPCs from the `::pvpc=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::pvpc=>` prompt.

**`configuration atm cell pvpc`**

## Adding ADSL Cell Channel Card PVPCs

From the `::pvpc=>` prompt, do one of the following:

- To add one PVPC, type the new command in the following format then press **ENTER**. The PVPC table index number is automatically assigned.

  **new** <src port> <vpi> <dst port> <vpi>
  [**-admin** (**up**|**down**)][**-txtraf** <src index>] [**-rxtraf** <src index>]
  [-**backup** [<lport> <vpi>]]

- To add multiple PVPCs with the same traffic profile, type the range command in the following format then press **ENTER**. The PVPC table index numbers are automatically assigned. At the confirmation message, type **Y** to create the PVPCs or type **N** to cancel the command.

  **range** <#pvcs> <src port> <vpi> <dst port> <vpi>
  [**-admin** (**up**|**down**)][**-txtraf** <src index>] [**-rxtraf** <src index>]
  [**-y**]

### Parameters

<#pvcs>

The number of PVPCs you want to create with the same traffic profile. See the table on page 24 to verify that the ports you plan to use for the PVPCs support the number of PVPCs you intend to create.

<src port>

One of the PVPC ports (format *slot.port)*. This can be either the line card or the channel card port.

<dest port>

The other PVPC port (format *slot.port)*. This can be either the line card or the channel card port.

<vpi>

The VPI associated with the preceding `<port>` parameter in the command line. See the table on page 24 for a summary of the supported VPI ranges for each card.

[**-admin** (**up**|**down**)]

(Optional) Type **-admin up** to activate the PVPC. Type **-admin down** to deactivate the PVPC. If you omit this parameter, the default admin status **up** is assigned.

[**-txtraf** <src index>] [**-rxtraf** <src index>]

(Optional) The index number of the transmit (-txtraf) and receive (-rxtraf) traffic profiles you want to assign to the source port of this PVPC. Transmitted traffic refers to all traffic transmitted out of the Avidia chassis, while received traffic refers to all traffic received into the Avidia chassis. The transmit and receive traffic profiles assigned to the PVPC source port are adjusted to reflect the same service on the destination port.

See “Displaying ATM Traffic Profiles” on page 156 for instructions on viewing the list of configured profiles. If you omit this parameter, an index of 0 (no profile) is assigned. If you specify a profile for transmitted traffic, but not for received traffic, the received traffic is automatically configured to match the transmitted traffic.

[**-backup** [<lport> <vpi>]]

(Optional) Configures a backup PVPC using the specified destination port (format *slot.port*) and VPI. Use the line card port (format *slot.port*) for the destination port. The VPI values can either be the same value as the primary PVPC or a different value. Omitting the `<lport> <vpi>` parameters automatically establishes a backup PVPC on the other line card using the same VPI as the primary PVPC.

[**-y**]

(Optional) Results in the creation of the specified range of PVPCs without first displaying a confirmation message. If you omit this parameter, a confirmation message displays.

### Examples

```
::pvpc=> new 8.5 9 12.1 9 -admin up -txtraf 3 -rxtraf 5 -backup
11.1 5 254
```

```
::pvpc=> range 100 8.5 9 12.1 9 -admin up -txtraf 3
 -rxtraf 5
```

## Adding a Backup PVPC to an Existing Cell Channel Card PVPC

You can configure backup PVPCs at the same time you configure a primary PVPC, as described in the previous section. However, you can also add a backup PVPC to an existing primary PVPC configuration.

From the `::pvpc=>` prompt, type the backup command in the following format:

`backup <index> [<lport> <vpi>]`

### Parameters

`<index>`

The PVPC Table row index number of the primary PVPC for which you want to configure a backup PVPC.

`[<lport> <vpi>]`

(Optional) Configures a backup PVPC using the specified destination port (format *slot.port*), and VPI. Use the line card port (format *slot.port*) for the destination port. The VPI value can either be the same value as the primary PVPC or a different value. Omitting this parameter automatically establishes a backup PVPC on the other line card using the same VPI as the primary PVPC.

### Examples

`::pvpc=>` **`backup 3 12.1 25`**

`::pvpc=>` **`backup 3`**

## Restoring Service from a Backup PVPC to a Primary Cell Channel Card PVPC

After traffic has switched from a primary PVPC to the configured backup PVPC, you can manually switch it back.

1. From the `::pvpc=>` prompt, type **`show`** to display the configured cell channel card PVPCs.
2. Note the PVPC table index number of the PVPC for which you want to restore service.
3. From the `::pvpc=>` prompt, type the restore command in the following format:

   `restore <index>`

#### Parameter

`<index>`

The PVPC Table row index number of the primary PVPC for which you want to switch traffic from the backup PVPC back to the primary PVPC.

#### Example

```
::pvpc=> restore 3
```

## Changing Cell Channel Card PVPC Admin Status

1. From the `::pvpc=>` prompt, type **`show`** then press **ENTER** to display the configured parameters for all PVPCs.
2. Note the index number of the PVPC for which you want to change the status.
3. Type the admin command in the following format then press **ENTER**.

   **`admin`** `<index> (`**`up|down`**`)`

#### Parameters

`<index>`

The index number of the PVPC you want to activate or deactivate.

`(`**`up|down`**`)`

Type **`up`** to activate the PVPC; type **`down`** to deactivate it.

#### Example

```
::pvpc=> admin 2 up
```

## Deleting Primary and Backup Cell Channel Card PVPCs

**If you remove a card from the system, the PVPCs associated with the ports on that card are disabled, however the PVPC configuration is not automatically removed from the PVPC table. Be sure to delete unused PVPC configurations so the PVPC configuration table accurately reflects the PVPCs in use in the system.**

1. From the ::pvpc=> prompt, type **show** then press **ENTER** to display all configured PVPCs.
2. Note the index number, port number, and VPI for the PVPC you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **delete** <index> [**-backup**]

### Parameters

<index>

The index number of the PVPC you want to delete.

[**-backup**]

(Optional) Type **-backup** to delete the backup PVPC associated with the primary PVPC and leave the primary PVPC configuration in place. Omitting this parameter deletes both the primary PVPC and any configured backup PVPC.

### Examples

::pvpc=> **delete 2 -backup**

::pvpc=> **delete 2**

## Displaying Cell Channel Card PVPC Information

From the `::pvpc=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<port> [<vpi>]]

### Parameters

[<port>]

The port number for which you want to display the configured PVPC (format *slot.port)*. Omitting this parameter displays all configured PVPCs.

[<vpi>]

The VPI associated with the specified port. Omit this parameter if you did not specify a port. If you did specify a port, but omit this parameter, all of the PVPCs configured on that port display.

### Example

::pvpc=> **show 11.1 9**

A screen similar to the following displays.

```
::pvpc=>show 11.1 9

      Source      Destination      TxTraffic  RxTraffic
Index Port  VPI   Port   VPI       Index      Index    Admin  Oper
2     3.1   9     11.1   9         1          2        up     up
```

The following table describes the information displayed after you type a show pvp command:

| Column | Description |
|---|---|
| Index | The PVPC table index number of the displayed PVPC. |
| Source Port | The subscriber-side port number. |
| VPI | The subscriber-side VPI. |
| Destination Port | The network-side port number. |
| VPI | The network-side VPI. |
| TxTraffic Index | The ATM traffic profile assigned for transmitted (downstream) data. |
| RxTraffic Index | The ATM traffic profile assigned for received (upstream) data. |
| Admin | The configured status of the PVPC, either up (activated) or down (deactivated). |
| Oper | The current operational status of the PVPC, either up (PVPC is passing data) or down (PVPC is not passing data). |

# CONFIGURING PVCCS

Configure primary PVCCs and backup PVCCs using the command-line interface. Backup PVCCs are redundant to primary PVCCs. A primary PVCC automatically switches to a backup PVCC if the primary PVCC were to fail.

PVCCs carry data between defined points within the Avidia chassis, such as between a channel card and a line card (see “Configuring Frame Channel Card PVCCs” on page 179 for creating cross-connects from a frame-based channel card). PVCCs also carry data from subscriber modems to Avidia channel cards, and from Avidia line cards to other destinations in the ATM backbone network.

PVCC configuration requires specifying a VPI and VCI. VPI and VCI combinations must be unique only on the same user port, as the circuit is remapped to a different VPI and VCI on the network interface. This enables different subscribers to use the same VPI and VCI combinations without creating conflict in the network.

# Configuring Cell Channel Card PVCCs

You can configure cross-connect PVCCs between cell-based channel cards and either line cards or the management card. You configure PVCCs from the `::pvcc=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::pvcc=>` prompt.

**`configuration atm cell pvcc`**

## Adding Cell Channel Card PVCCs

From the `::pvcc=>` prompt, do one of the following:

- To add one PVCC, type the new command in the following format then press **ENTER**. The PVCC table index number is automatically assigned.

  ```
  new <src port> <vpi> <vci> <dst port> <vpi> <vci>
  [-admin (up|down)][-txtraf <src index>] [-rxtraf <src index>]
  [-backup [<lport> <vpi> <vci>]]
  ```

- To add multiple PVCCs with the same traffic profile, type the range command in the following format then press **ENTER**.

  ```
  range <#pvcs> <src port> <vpi> <vci> <dst port> <vpi> <vci>
  [-admin (up|down)][-txtraf <src index>] [-rxtraf <src index>]
  [-y]
  ```

### Parameters

`<#pvcs>`

The number of PVCCs you want to create with the same traffic profile. See the table on page 24 to verify that the ports you plan to use for the PVCCs support the number of PVCCs you intend to create.

`<src port>`

One of the PVCC ports (format *slot.port)*. This can be either the line card or the channel card port.

`<lport>`

The other PVCC port (format *slot.port)*. This can be either the line card or the channel card port.

`<vpi>`

The VPI associated with the preceding `<port>` parameter in the command line. See the table on page 24 for a summary of the supported VPI ranges for each card.

`<vci>`

The VCIs associated with the preceding `<port>` parameter in the command line. When using the range command, the first PVCC is assigned the VCI you specify for this parameter, and each additional PVCC is assigned the next sequential VCI. Before assigning a VCI, verify that it has not already been assigned to a PVCC with the same VPI on the same port. See “Displaying Cell Channel Card PVCC Information” on page 177 for instructions on viewing the already-configured PVCCs. See the table on page 24 for a summary of the supported VPI ranges for each card.

[**-admin** (**up**|**down**)]

(Optional) Type **-admin up** to activate the PVCC. Type **-admin down** to deactivate the PVCC. If you omit this parameter, the default admin status **up** is assigned.

[**-txtraf** <src index>] [**-rxtraf** <src index>]

(Optional) The index number of the transmit (-txtraf) and receive (-rxtraf) traffic profiles you want to assign to the source port of this PVCC. Transmitted traffic refers to all traffic transmitted out of the Avidia chassis, while received traffic refers to all traffic received into the Avidia chassis. The transmit and receive traffic profiles assigned to the PVCC source port are adjusted to reflect the same service on the destination port.

See “Displaying ATM Traffic Profiles” on page 156 for instructions on viewing the list of configured profiles. If you omit this parameter, an index of 0 (no profile) is assigned. If you specify a profile for transmitted traffic, but not for received traffic, the received traffic is automatically configured to match the transmitted traffic.

[**-backup** [<lport> <vpi> <vci>]]

(Optional) Configures a backup PVCC using the specified destination port (format *slot.port*), VPI and VCI. Use the line card port (format *slot.port*) for the destination port. The VPI and VCI values can either be the same values as the primary PVCC or different values. Omitting the `<lport> <vpi> <vci>` parameters automatically establishes a backup PVCC on the other line card using the same VPI and VCI as the primary PVCC.

[**-y**]

(Optional) Results in the creation of the specified range of PVPCs without first displaying a confirmation message. If you omit this parameter, a confirmation message displays.

### Examples

```
::pvcc=> new 2.5 0 33 12.1 0 33 -admin up -txtraf 3 -rxtraf 5
-backup 11.1 0 33
```

```
::pvcc=> range 16 2.5 0 33 12.1 0 33 -admin up -txtraf 3
-rxtraf 5 -y
```

## Adding a Backup PVCC to an Existing Cell Channel Card PVCC

You can configure backup PVCCs at the same time you configure a primary PVCC, as described in the previous section. However, you can also add a backup PVCC to an existing primary PVCC configuration.

From the `::pvcc=>` prompt, type the backup command in the following format:

```
backup <index> [<lport> <vpi> <vci>]
```

### Parameters

`<index>`

The PVCC Table row index number of the primary PVCC for which you want to configure a backup PVCC.

`[<lport> <vpi> <vci>]`

(Optional) Configures a backup PVCC using the specified destination port (format *slot.port*), VPI and VCI. Use the line card port (format *slot.port*) for the destination port. The VPI and VCI values can either be the same values as the primary PVCC or different values. Omitting this parameter automatically establishes a backup PVCC on the other line card using the same VPI and VCI as the primary PVCC.

### Examples

```
::pvcc=> backup 3 12.1 0 100
```

```
::pvcc=> backup 3
```

## Restoring Service from a Backup PVCC to a Primary Cell Channel Card PVCC

After traffic has switched from a primary PVCC to the configured backup PVCC, you can manually switch it back.

1. From the `::pvcc=>` prompt, type **`show`** to display the configured cell channel card PVCCs.
2. Note the PVCC table index number of the PVCC for which you want to restore service.
3. From the `::pvcc=>` prompt, type the restore command in the following format:

   ```
   restore <index>
   ```

#### Parameter

`<index>`

The PVCC Table row index number of the primary PVCC for which you want to switch traffic from the backup PVCC back to the primary PVCC.

#### Example

```
::pvcc=> restore 3
```

### Changing Cell Channel Card PVCC Admin Status

1. From the `::pvcc=>` prompt, type **`show`** then press **ENTER** to display the configured parameters for all PVCCs.
2. Note the index number of the PVCC for which you want to change the status.
3. Type the admin command in the following format then press **ENTER**.

   **`admin`** `<index> (`**`up`**`|`**`down`**`)`

#### Parameters

`<index>`

The index number of the PVCC you want to activate or deactivate.

`(`**`up`**`|`**`down`**`)`

Type **`up`** to activate the PVCC. Type **`down`** to deactivate the PVCC.

#### Example

```
::pvcc=> admin 2 up
```

## Deleting Primary and Backup Cell Channel Card PVCCs

You can delete primary and backup cell channel card PVCCs from the `::pvcc=>` prompt.

**If you remove a card from the system, the PVCCs associated with the ports on that card are disabled, however the PVCC configuration is not automatically removed from the PVCC table. Be sure to delete unused PVCC configurations so the PVCC configuration table accurately reflects the PVCCs in use in the system.**

1. From the `::pvcc=>` prompt, type **show** then press ENTER to display the configured parameters for all PVCCs.
2. Note the index number of the PVCC you want to delete (or for which you want to delete the backup PVCC).
3. Type the delete command in the following format then press ENTER.

   **delete** <index> [**-backup**]

### Parameters

<index>

The index number of the PVCC you want to delete.

[**-backup**]

(Optional) Type **-backup** to delete the backup PVCC associated with the primary PVCC and leave the primary PVCC configuration in place. Omitting this parameter deletes both the primary PVCC and any configured backup PVCC.

### Examples

::pvcc=> **delete 2 -backup**

::pvcc=> **delete 2**

## Deleting Mismatched Internal Cell Channel Card PVCCs

When you delete cell channel card PVCCs, mapping information stored in the internal PVCC tables may not automatically be deleted. This results in mismatched PVCCs, or PVCCs for which the mapping data is not consistent across all PVCC tables. Therefore, after deleting PVCCs, you should check for mismatched internal PVCCs and delete them.

**Before deleting mismatched PVCCs, be sure they are not a result of a card being temporarily removed. Once the card is replaced, the PVCC data will no longer be mismatched.**

1 From the `::root=>` prompt, type the following command then press **ENTER** to display the `::vcl=>` prompt.

**`configuration atm vcl`**

2 From the `::vcl=>` prompt, type **`show`** then press **ENTER** to display the mismatched internal PVCCs.

```
::vcl=> show

ifIndex              VPI              VCI

65665                 0               213
65729                 0               1027
```

3 Note the ifIndex number, VPI and VCI of the internal PVCC you want to delete.

4 Type the delete command in the following format then press **ENTER**.

**`delete`** `<ifIndex> <vpi> <vci>`

### Parameters

`<ifIndex>`

The internal index number of the internal PVCC you want to delete.

`<vpi>`

The VPI of the internal PVCC you want to delete.

`<vci>`

The VCI of the internal PVCC you want to delete.

### Example

::vcl=> **delete 65665 0 213**

## Displaying Cell Channel Card PVCC Information

From the `::pvcc=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<port> [<vpi> [<vci>]]]

### Parameters

[<port>]

(Optional) Specifies a port for which to display the PVCC configuration (format *slot.port)*. Omitting this parameter displays all configured PVCCs.

[<vpi>]

(Optional) The VPI configured for the specified port. Omit this parameter if you did not specify a port or to display all the configured PVCCs for the specified port.

[<vci>]

(Optional) The VCI configured for the specified port. Omit this parameter if you did not specify a port, or if you specified a port but did not specify a VPI.

### Examples

::pvcc=> **show 2.5 0 379**

::pvcc=> **show**

The following screen illustrates an example of both show PVCC commands.

```
::pvcc=> show
                                                 Source     Source
                Source         Destination       TxTraffic   RxTraffic
Index Admin Oper Port VPI VCI  Port VPI VCI      Index      Index
  1   up    up   2.1   0  400  12.1  0  401      3           3
  2   up    up   2.1   0  201  12.1  0  200      2           1
  3   up    up   2.1   0   32  12.1  0  32       2           1

::pvcc=> show 2.1 0 400
                                                 Source      Source
                Source         Destination       TxTraffic    RxTraffic
Index Admin Oper Port VPI VCI  Port VPI VCI      Index        Index
  1   up    up   2.1   0  400  12.1  0  401      3            3
```

The following table describes the information displayed after you type a show pvc command.

| Column | Description |
|---|---|
| Index | The PVCC table index number of the displayed PVCC. |
| Admin | The configured status of the PVCC, either up (activated) or down (deactivated). |
| Oper | The current operational status of the PVCC, either up (PVCC is passing data) or down (PVCC is not passing data). |
| Source Port | The PVCC source port number. This is the lower-numbered of the two PVCC ports. If you assigned the higher-numbered port to the `<src port>` parameter during PVCC configuration, the system automatically reassigns the higher-numbered port to the `<dest port>` parameter. |
| VPI | The source port VPI. |
| VCI | The source port VCI. |
| Destination Port | The PVCC destination port number. This is the higher-numbered of the two PVCC ports. If you assigned the lower-numbered port to the `<dest port>` parameter during PVCC configuration, the system automatically reassigns the lower-numbered port to the `<src port>` parameter. |
| VPI | The destination port VPI. |
| VCI | The destination port VCI. |
| Source TxTraffic Index | The ATM traffic profile assigned to data transmitted from the source port. The transmit traffic profile assigned to the PVCC source port are adjusted to reflect the same service on the destination port. |
| Source RxTraffic Index | The ATM traffic profile assigned to data received on the source port. The receive traffic profile assigned to the PVCC source port are adjusted to reflect the same service on the destination port. |

# Configuring Frame Channel Card PVCCs

You can configure cross-connect PVCCs between frame-based channel cards and line cards or the management card. You configure PVCCs from the `::pvcc=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::pvcc=>` prompt.

**`configuration atm frame pvc`**

## Adding Frame Channel Card PVCCs

**For frame channel cards, the VPI is always zero and the system automatically assigns the VCI. Therefore, you do not enter this information during frame channel card PVCC configuration.**

From the `::pvcc=>` prompt, do one of the following:

- To add one PVCC, type the new command in the following format then press **ENTER**. The PVCC table index number is automatically assigned.

  **new** <cport> <lport> <lvpi> <lvci> [**-mode** (**vcmux**|**llc**)]
  [**-admin** (**up**|**down**)][**-txtraf** <index>] [**-rxtraf** <index>]
  [-**backup** [<lport> <vpi> <vci>]]

- To add multiple PVCCs with the same traffic profile, type the range command in the following format then press **ENTER**.

  **range** <#pvcs> <cport> <lslot> <lvpi> <lvci>
  [**-mode** (**vcmux**|**llc**)] [**-admin** (**up**|**down**)] [**txtraf** <index>]
  [**-rxtraf** <index>] [**-y**]

### Parameters

<#pvcs>

The number of PVCCs you want to create with the same traffic profile. See the table on page 24 to verify that the ports you plan to use for the PVCCs support the number of PVCCs you intend to create.

<cport>

The channel card slot number or slot and port number for the PVCC. To map the PVCC to a specific service type on a specific port, specify *slot.port*. Otherwise, use the format *slot*.

`<lport>`

The PVCC line card slot and port number (format *slot.port).*

`<cslot>`

The channel card slot number for the PVCC.

`<lslot>`

The line card slot number for the PVCC.

`<lvpi>`

The line card VPI. See the table on page 24 for a summary of the supported VPI ranges for each card.

`<lvci>`

The line card VCI. When using the range command, the first PVCC is assigned the VCI you specify for this parameter, and each additional PVCC is assigned the next sequential VCI. Before assigning a VCI, verify that it has not already been assigned to a PVCC with the same VPI on the same port. See "Displaying Frame Channel Card PVCC Information" on page 186 for instructions on viewing the already-configured PVCCs. See the table on page 24 for a summary of the supported VPI ranges for each card.

**`[-mode (vcmux|llc)]`**

(Optional) The encapsulation mode. Type **`-mode vcmux`** or **`-mode llc`**. This setting must match the encapsulation protocol used at the remote end. The default is **`llc`**. The LLC (Logical Link Control) encapsulation is supported by most ATM devices but has more overhead than vc-mux encapsulation. Use LLC only if the remote device that is connected to the frame channel card port uses RFC1483 Ethernet bridging (it will not work with token ring networks). Vcmux does not use an encapsulation header and works with any network protocol.

Both encapsulation modes are from ietf RFC1483 Multiprotocol Encapsulation over ATM Adaptation Layer 5.

**`[-admin (up|down)]`**

(Optional) Type **`-admin up`** to activate the PVCC. Type **`-admin down`** to deactivate the PVCC. Omitting this parameter sets the admin status to the default **`up`**.

[**-txtraf** <index>] [**-rxtraf** <index>]

(Optional) The index number of the transmit (-rxtraf) and receive (-txtraf) traffic profiles you want to assign to this PVCC. See "Displaying ATM Traffic Profiles" on page 156 for instructions on viewing the list of configured profiles. If you do not specify the index, an index of 0 (no profile) is assigned. If you specify a profile for transmitted traffic, but not for received traffic, the received traffic is automatically configured to match the transmitted traffic.

[**-backup** [<lport> <vpi> <vci>]]

(Optional) Configures a backup PVCC using the specified destination port (format *slot.port*), VPI and VCI. Use the line card port for the destination port. The VPI and VCI values can either be the same values as the primary PVCC or different values. Omitting the `<dst port> <vpi> <vci>` parameters automatically establishes a backup PVCC on the other line card using the same VPI and VCI as the primary PVCC.

[**-y**]

(Optional) Results in the creation of the specified range of PVCCs without first displaying a confirmation message. If you omit this parameter, a confirmation message displays.

### Examples

::pvcc=> **new 2.5 12.1 50 100 -mode vcmux -admin up -txtraf 3 -rxtraf 5 -backup 11.1 50 100**

::pvcc=> **range 16 2 12 50 100-mode vcmux -admin up -txtraf 3 -rxtraf 5**

## Adding a Backup PVCC to an Existing Frame Channel Card PVCC

You can configure backup PVCCs at the same time you configure a primary PVCC, as described in the previous section. However, you can also add a backup PVCC to an existing primary PVCC configuration.

From the `::pvcc=>` prompt, type the backup command in the following format:

**backup** <index> [<lport> <vpi> <vci>]

### Parameters

`<index>`

The PVCC Table row index number of the primary PVCC for which you want to configure a backup PVCC.

`[<lport> <vpi> <vci>]`

(Optional) Configures a backup PVCC using the specified line card port (format *slot.port*), VPI and VCI. The VPI and VCI values can either be the same values as the primary PVCC or different values. Omitting this parameter automatically establishes a backup PVCC on the other line card using the same VPI and VCI as the primary PVCC.

### Examples

`::pvcc=>` **`backup 3 12.1 0 100`**

`::pvcc=>` **`backup 3`**

## Restoring Service from a Backup PVCC to a Primary Frame Channel Card PVCC

After traffic has switched from a primary PVCC to the configured backup PVCC, you can manually switch it back.

**1** From the `::pvcc=>` prompt, type **`show`** to display the configured frame channel card PVCCs.

**2** Note the PVCC table index number of the PVCC for which you want to restore service.

**3** From the `::pvcc=>` prompt, type the restore command in the following format:

**`restore`** `<index>`

### Parameter

`<index>`

The PVCC Table row index number of the primary PVCC for which you want to switch traffic from the backup PVCC back to the primary PVCC.

### Example

`::pvcc=>` **`restore 3`**

## Changing Frame Channel Card PVCC Admin Status

1. From the ::pvcc=> prompt, type **show** then press **ENTER** to display the configured parameters for all PVCCs.
2. Note the index number of the PVCC you want to activate or deactivate.
3. Type the admin command in the following format then press **ENTER**.

   **admin** <index> (**up|down**)

### Parameters

<index>

The index number of the PVCC you want to activate or deactivate.

(**up|down**)

Type **up** to activate the PVCC. Type **down** to deactivate the PVCC.

### Example

::pvcc=> **admin 2 up**

## Deleting Primary and Backup Frame Channel Card PVCCs

You can delete primary and backup PVCCs from the ::pvcc=> prompt.

**If you remove a card from the system, the PVCCs associated with the ports on that card are disabled, however the PVCC configuration is not automatically removed from the PVCC table. Be sure to delete unused PVCC configurations so the PVCC configuration table accurately reflects the PVCCs in use in the system.**

1. From the ::pvcc=> prompt, type **show** then press **ENTER** to display the configured parameters for all PVCCs.
2. Note the index number of the PVCC you want to delete (or for which you want to delete a backup PVCC).
3. Type the delete command in the following format then press **ENTER**.

   **delete** <index> [**-backup**]

### Parameters

`<index>`

The index number of the PVCC you want to delete.

`[-backup]`

(Optional) Type **-backup** to delete the backup PVCC associated with the primary PVCC and leave the primary PVCC configuration in place. Omitting this parameter deletes both the primary PVCC and any configured backup PVCC.

### Examples

::pvcc=> **delete 2 -backup**

::pvcc=> **delete 2**

## Deleting Mismatched Internal Frame Channel Card PVCCs

When you delete frame channel card PVCCs, mapping information stored in the internal PVCC tables may not automatically be deleted. This results in mismatched PVCCs, or PVCCs for which the mapping data is not consistent across all PVCC tables. Therefore, after deleting frame channel PVCCs, you should check for mismatched internal PVCCs and delete them.

**Before deleting mismatched PVCCs, be sure they are not a result of a card being temporarily removed. Once the card is replaced, the PVCC data will no longer be mismatched.**

1 From the `::root=>` prompt, type the following command then press ENTER to display the `::vcl=>` prompt.

   **configuration atm vcl**

2 From the `::vcl=>` prompt, type **show** then press ENTER to display the mismatched internal PVCCs.

```
::vcl=> show


ifIndex                 VPI              VCI

65665                    0               213
65729                    0               1027
```

**3** Note the ifIndex number, VPI and VCI of the internal PVCC you want to delete.

**4** Type the delete command in the following format then press **ENTER**.

`delete <ifIndex> <vpi> <vci>`

**5** Type **up** to display the `::atm=>` prompt.

**6** From the `::atm=>` prompt, type the following command then press **ENTER** to display the `::pvcservice=>` prompt.

**`frame pvc pvcservice`**

**7** From the `::pvcservice=>` prompt, type **show** then press **ENTER** to display the mismatched internal PVCCs.

```
::pvcservice=> show

      SarVPI            SarVCI              IfIndex

        0                 213               65665
        0                 1027              65729
```

**8** Note the ifIndex number, VPI and VCI of the internal PVCC you want to delete.

**9** Type the delete command in the following format then press **ENTER**.

`delete <vpi> <vci> <ifIndex>`

### Parameters

`<ifIndex>`

The internal index number of the internal PVCC you want to delete.

`<vpi>`

The VPI of the internal PVCC you want to delete.

`<vci>`

The VCI of the internal PVCC you want to delete.

### Examples

`::vcl=>` **`delete 65665 0 213`**

`::pvcservice=>` **`delete 0 213 65665`**

## Displaying Frame Channel Card PVCC Information

From the `::pvcc=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<slot> [<vpi> [<vci>]]]

### Parameters

[<slot>]

(Optional) Specifies a slot for which to display the PVCC configuration. Omitting this parameter displays all configured PVCCs.

[<vpi>]

(Optional) The VPI configured for the specified port. Omit this parameter if you did not specify a port or to display all the configured PVCCs for the specified port.

[<vci>]

(Optional) The VCI configured for the specified port. Omit this parameter if you did not specify a port, or if you specified a port but did not specify a VPI.

### Examples

::pvcc=> **show 2 0 379**

::pvcc=> **show**

The following screen illustrates an example of both show PVCC commands.

```
::pvc=> show
              Channel                      Line
Index  Admin  Oper Port  VCI  Type  Encap   Port  VPI  VCI  TxIDx  RxIDx
2      up     up   2.1   50   TLS   vcmux   12.1  50  100    2      2
3      down   down 2.2   51   TLS   vcmux   12.1  50  101    2      3

::pvc=> show 2 0 50
              Channel                      Line
Index  Admin  Oper Port  VCI  Type  Encap   Port  VPI  VCI  TxIDx  RxIDx
2      up     up   2.1   50   TLS   vcmux   12.1  50  100    2      2
```

The following table describes the information displayed after you type a show pvc command.

| **Column** | **Description** |
|---|---|
| Index | The PVCC table index number of the displayed PVCC. |
| Admin | The administrative status of the PVCC. Up indicates active. Down indicates inactive. |
| Oper | The operational status of the PVCC. Up indicates operational and passing data. Down indicates not operational. |
| Channel Port | The channel card slot and port. |
| VCI | The channel card VCI. |
| Type | The type of service on the line. Currently, Transparent LAN Service is the only supported service, therefore TLS displays. |
| Encap | The encapsulation mode. |
| Line Port | The line card port number. |
| VPI | The line card VPI. |
| VCI | The line card VCI. |
| TxIDx | The ATM traffic profile assigned for transmitted traffic. |
| RxIDx | The ATM traffic profile assigned for received traffic. |

### Changing the Encapsulation Mode

You can change a PVCC encapsulation mode from the `::pvcc=>` prompt. From the `::pvcc=>` prompt, type the encap command in the following format then press **ENTER**.

**encap** <index> [**-port** <xDSL_port>] [**-mode** (**vcmux**|**llc**)]

#### Parameters

<index>

The index number of the PVCC for which you want to change the encapsulation mode. See "Displaying Frame Channel Card PVCC Information" on page 186 to display the configured frame channel card PVCCs.

[**-port** <xDSL_port>]

(Optional) The channel card port number of the PVCC. Typing **-port 0** removes the mapping between the PVCC and the port to which it is mapped.

[**-mode** (**vcmux**|**llc**)]

(Optional) The available encapsulation mode options. Type either **-mode vcmux** or **-mode llc**.

#### Example

::pvcc=> **encap 2 -port 4.2 -mode llc**

## CONFIGURING SPVCS

SPVCs (Soft Permanent Virtual Circuits) provide a PVC between the CPE and the line card, and an SVC (Switched Virtual Circuit) between the line card and the destination ATM end system. SVCs are virtual connections that are established through an ATM network using signaling (the end-points are defined when the call is initiated and terminated at the end of the call). SPVCs, then, enable ATM connection redundancy between the line card and the ATM end system.

You configure SPVCs from the `::spvc=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::spvc=>` prompt:

**configuration atm cell spvc**

## Adding SPVCs

From the `::spvc=>` prompt, type the new command in the following format, then press **ENTER**.

**new** <slot.port> <vpi> <vci> <dstaddr> [**-txtraf** <src index>] [**-rxtraf** <src index>][**-interval** <interval>] [**-retrynumber** <n>][**-mode** <(**vcmux|llc**)>][**-admin** (**up|down**)]

### Parameters

<slot.port>

The SPVC channel card slot and port (format *slot.port*).

<vpi>

The VPI of the VCC between the CPE and the line card.

<vci>

The VCI of the VCC between the CPE and the line card.

<dstaddr>

The ATM address of the destination ATM end system. The address can be up to 20 octets. The first octet must be 39, 45, or 47. Each octet must be separated by a colon.

[**-txtraf** <src index>]

(Optional) The traffic descriptor profile index to assign to transmitted traffic.

[**-rxtraf** <src index>]]

(Optional) The traffic descriptor profile index to assign to received traffic.

[**-interval** <interval>]

(Optional) The retry interval, or number of seconds the system waits before reattempting to establish the SPVC after a failed call attempt. The range is 0 to 3600.

[**-retrynumber** <n>]

(Optional) The retry limit, or maximum number of allowable unsuccessful call setup attempts. The range is 0 to 65535.

[**-admin** (**up|down**)]

(Optional) The SPVC administrative status. Type **-admin up** to activate the SPVC, or type **-admin down** to deactivate it.

### Example

```
::spvc=> new 4.3 100 100 39:26:34:34:75:85:11:08 -txtraf 3
-rxtraf 4 -interval 100 -retrynumber 50 -admin up
```

## Changing SPVC Admin Status

From the appropriate `::spvc=>` prompt, type the admin command in the following format, then press **ENTER**.

**admin** `<slot.port> <vpi> <vci> <(`**up|down**`)>`

### Parameters

`<slot.port>`

The SPVC channel card slot and port (format *slot.port*).

`<vpi>`

The VPI of the VCC between the CPE and the line card.

`<vci>`

The VCI of the VCC between the CPE and the line card.

`<(`**up|down**`)>`

Type **up** to activate the SPVC, or type **down** to deactivate it.

### Example

```
::spvc=>admin 4.3 100 100 up
```

## Displaying SPVCs

From the `::spvc=>` prompt, type the show command in the following format, then press **ENTER**.

**show** `[<slot.port> [<vpi> [<vci>]]]`

### Parameters

`[<slot.port>]`

(Optional) The slot and port for which you want to display SPVC information (format *slot.port*). Omitting this parameter displays all configured SPVC information for the system.

`[<vpi>]`

(Optional) The specific VPI for which you want to display all configured SPVC information. Omitting this parameter displays SPVC information for all VPIs.

`[<vci>]`

(Optional) The specific VCI for which you want to display all configured SPVC information. Omitting this parameter displays SPVC information for all VCIs.

## Examples

`::spvc=>`**`show`**

`::spvc=>`**`show 3.2 100 100`**

A screen similar to the following displays:

```
::spvc=>
                  Source          Dest
Admin Oper        Slot  VPI  VCI  Addr
up    connected   3.2   100  100  56:26:34:34:75:85:11:08

Source  Source     Last
TxTraf  RxDesc     Rel     Retry
Index   Index      Cause   Fail
4       4          ???     2
```

| Information | Description |
|---|---|
| Admin | The SPVC administrative status. Options:<br>• Up—activated<br>• Down—deactivated |
| Oper | The SPVC operational status. Options:<br>• In Progress—attempting to connect<br>• Connected—operational<br>• Retries Exhausted—not operational |
| Source Slot | The channel card slot and port (format *slot.port*). |
| Source VPI | The VPI of the VCC between the CPE and the line card. |
| Source VCI | The VCI of the VCC between the CPE and the line card. |
| Destination Addr | The ATM address of the destination ATM end system. |
| Source TxTraf Index | The traffic descriptor profile index assigned to the SPVC transmitted traffic. |
| Source RxDesc Index | The traffic descriptor profile index assigned to the SPVC received traffic. |
| Last Rel Cause | The reason the SPVC was last disabled. This displays as a numeric code. See “SPVC Last Release Cause Codes” on page 607 for code definitions. |
| Retry Fail | The number of times the system has attempted to restart non-operational SPVC but failed. |

## Displaying SPVC Details

From the appropriate `::spvc=>` prompt, type the detailshow command in the following format, then press **ENTER**.

**`detailshow`** `<slot.port> <vpi> <vci>`

#### Parameters

`<slot.port>`

The slot and port for which you want to display SPVC information (format *slot.port*). Omitting this parameter displays all configured SPVC information for the system.

`<vpi>`

The specific VPI for which you want to display all configured SPVC information. Omitting this parameter displays SPVC information for all VPIs.

`<vci>`

The specific VCI for which you want to display all configured SPVC information. Omitting this parameter displays SPVC information for all VCIs.

#### Example

`::spvc=>`**`detailshow 3.2 100 100`**

A screen similar to the following displays:

```
::spvc=>detailshow

Admin Status:           Up
Operation Status:       In Progress
Source Slot:            3.2
Source VPI              100
Source VCI              100
Destination Address:    39:26:34:34:75:85:11:08
Source Tx Traffic Index:0
Source Rx Traffic Index:0
Last release cause:     0
Retry Failures:         0
Retry Interval:         10
Retry Limit:            0
```

| Information | Description |
|---|---|
| Admin Status | The SPVC administrative status. Options:<br>• Up—activated<br>• Down—deactivated |
| Operation Status | The SPVC operational status. Options:<br>• In Progress—attempting to connect<br>• Connected—operational<br>• Retries Exhausted—not operational |
| Source Slot | The channel card slot and port (format *slot.port*). |
| Source VPI | The VPI of the VCC between the CPE and the line card. |
| Source VCI | The VCI of the VCC between the CPE and the line card. |
| Destination Address | The ATM address of the destination ATM end system. |
| Source Tx Traffic Index | The traffic descriptor profile index assigned to the SPVC transmitted traffic. |
| Source Rx Traffic Index | The traffic descriptor profile index assigned to the SPVC received traffic. |
| Last Release Cause | The reason the SPVC was last disabled. This displays as a numeric code. See “SPVC Last Release Cause Codes” on page 607 for code definitions. |
| Retry Failures | The number of times the system has attempted to restart non-operational SPVC but failed. |
| Retry Interval | The number of seconds the system waits before attempting to re-establish the SPVC after a failed call attempt (range: 0 to 3600). |
| Retry Limit | The maximum allowable number of unsuccessful call setup attempts (range: 0 to 65535). |

## Deleting SPVCs

From the appropriate `::spvc=>` prompt, type the delete command in the following format, then press **ENTER**.

```
delete <slot.port> <vpi> <vci>
```

#### Parameters

`<slot.port>`

The SPVC channel card slot and port (format *slot.port*).

`<vpi>`

The VPI of the VCC between the CPE and the line card.

`<vci>`

The VCI of the VCC between the CPE and the line card.

#### Example

```
::spvc=> delete 4.3 100 100
```

## Restarting SPVCs

You can manually attempt to restart an SPVC that is not operational. From the appropriate `::spvc=>` prompt, type the restart command in the following format, then press **ENTER**.

```
restart <slot.port> <vpi> <vci>
```

#### Parameters

`<slot.port>`

The SPVC channel card slot and port (format *slot.port*).

`<vpi>`

The VPI of the VCC between the CPE and the line card.

`<vci>`

The VCI of the VCC between the CPE and the line card.

#### Example

```
::spvc=> restart 4.3 100 100
```

# CONFIGURING ATM ROUTING

If an Avidia system has two line cards installed, you can configure IISP (Interim Inter-Switch Signaling Protocol) static routes to provide line card redundancy. IISP enables static routing of signaling messages between clustered AVIDIA systems. When a line card fails, the system uses the IISP static route configuration to reroute SPVCs to another line card.

You configure ATM routing from the `::route=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::route=>` prompt:

**`configuration atm route`**

## Adding ATM Routing Table Entries

From the `::route=>` prompt, type the new command in the following format, then press **ENTER**.

**new** `<address> <length> <slot.port> [`**-admin** `(`**active|inactive**`)]`

### Parameters

`<address>`

The ATM address of the destination ATM end system. The address can be up to 20 octets. The first octet must be 39, 45, or 47. Each octet must be separated by a colon.

`<length>`

The number of destination ATM address prefix octets you want the system to consider when determining whether the ATM routing table entry matches a particular SPVC. For example, if you set the matching length to 2, then all SPVCs for which the first two octets of the destination ATM address prefix match the first two octets of the ATM Routing Table entry will be routed according to the information in that table entry.

`<slot.port>`

The line card slot and port to which you want to route the traffic when the current line card fails.

`[`**`-admin`**` (`**`active|inactive`**`)]`

The administrative status of the routing table entry. Type **`-admin active`** to activate it or type **`-admin inactive`** to deactivate it.

### Example

```
::route=> new 39:26:34:34:75:85:11:08 5 12.1 -admin active
```

## Displaying ATM Routing Table Entries

From the `::route=>` prompt, type the show command in the following format, then press **ENTER**.

**`show`** `[<slot.port>]`

### Parameter

`[<slot.port>]`

(Optional) The slot and port for which you want to display ATM routing information. Omitting this parameter displays the entire ATM Routing Table.

### Examples

```
::route=> show
::route=> show 11.1
```

A screen similar to the following displays:

```
::route=>
        Destination
Index   Address                    Slot  Length      Admin     Oper
1       39:26:34:34:75:85:11:08    11.1  5           Active    Active
2       39:69:24:97:21:35:34:36    11.1  8           Inactive  Inactive
```

| Information | Description |
|---|---|
| Index | The ATM Routing Table row number. |
| Destination Address | The ATM address of the destination ATM end system. |
| Length | The number of destination ATM address prefix octets the system considers when determining whether the ATM routing table entry matches a particular SPVC. |
| Slot | The line card slot to which you want to route the traffic when the current line card fails. |
| Admin | The static route administrative status. Options:<br>• Active<br>• Inactive |
| Oper | The static route operational status. Options:<br>• Active—passing data.<br>• Inactive—not operational. |

## Changing ATM Routing Admin Status

From the `::route=>` prompt, type the admin command in the following format, then press ENTER.

**admin** `<index> <(`**active|inactive**`)>`

### Parameters

`<index>`

The ATM Routing Table index number of the entry you want to change.

`<(`**active|inactive**`)>`

Type **active** to activate the SPVC, or type **inactive** to deactivate it.

## Deleting ATM Routing Table Entries

From the `::route=>` prompt, type the delete command in the following format, then press ENTER.

**delete** `<index>`

### Parameter

`<index>`

The index number of the ATM Routing Table row you want to delete.

### Example

`::route=>` **delete** `2`

# CONFIGURING ATM POLICING

Policing, or UPC, enables you to specify whether traffic must conform to the configured traffic contract. When policing is enabled, traffic that does not conform to the contract is deleted. You can enable or disable policing by ATM port.

## ATM Port Policing

You enable or disable policing (UPC) for ATM ports from the `::port=>` prompt. From the `::root=>` prompt, type the following command then press ENTER to display the `::port=>` prompt:

**`configuration atm upc port`**

### Configuring ATM Port Policing

1. From the `::port=>` prompt type **`show`** to display the UPC Table.
2. Note the index number of the UPC Table entry for which you want to configure policing.
3. From the `::port=>` prompt type the modify command as follows, then press ENTER.

   **`modify`** `<index>` `<`**`enable|disable`**`>`

#### Parameters

`<index>`

The index number of the UPC Table entry you want to configure.

`<`**`enable|disable`**`>`

The administrative status of policing on the selected port.

#### Example

`::port=>` **`modify 4 enable`**

### Displaying the UPC Table

To verify the policing configuration for each port, from the `::port=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays.

```
::port=> show

                    UPC
Index     Port      Status

1         1.1       enable
2         3.1       disable
3         3.2       enable
4         3.3       enable
5         3.4       enable
```

## PVC Policing

Policing, or UPC, enables you to specify whether traffic must conform to the configured traffic contract. When policing is enabled, traffic that does not conform to the contract is deleted. You can enable or disable policing by PVCC.

You enable or disable policing (UPC) by ATM port from the `::vcl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::vcl=>` prompt:

**`configuration atm upc vcl`**

### Configuring PVCC Policing

1. From the `::port=>` prompt type **`show`** to display the PVCC Table.
2. Note the index number of the PVCC Table entry for which you want to configure policing.
3. From the `::vcl=>` prompt type the modify command as follows, then press **ENTER**.

   **`modify`** `<index>` `<`**`enable|disable`**`>`

### Parameters

`<index>`

The index number of the PVCC Table entry you want to configure.

`<`**`enable|disable`**`>`

The administrative status of policing on the selected port.

### Example

`::vcl=>` **`modify 4 enable`**

## Displaying the PVCC Policing Table

To verify the policing configuration for each PVCC, from the `::vcl=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays.

```
::vcl=> show

                                        UPC
Index     Port      VPI     VCI         Status

1         1.1       0       1024        enable
2         2.1       0        115        disable
```

# PVP Policing

Policing, or UPC, enables you to specify whether traffic must conform to the configured traffic contract. When policing is enabled, traffic that does not conform to the contract is deleted. You can enable or disable policing by PVPC.

You enable or disable policing (UPC) by PVPC from the `::vpl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::vpl=>` prompt:

**`configuration atm upc vpl`**

## Configuring PVPC Policing

1. From the `::port=>` prompt type **`show`** to display the PVPC Table.
2. Note the index number of the PVPC Table entry for which you want to configure policing.
3. From the `::vpl=>` prompt type the modify command as follows, then press **ENTER**.

   **`modify`** `<index>` `<`**`enable|disable`**`>`

### Parameters

`<index>`

The index number of the PVPC Table entry you want to configure.

`<`**`enable|disable`**`>`

The administrative status of policing on the selected PVPC.

### Example

`::vpl=>` **`modify 4 enable`**

## Displaying the PVPC Policing Table

To verify the policing configuration for each PVPC, from the `::vpl=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays.

```
::vpl=> show

                                UPC
Index     Port       VPI        Status

1         1.1        0          enable
2         2.1        0          disable
```

# CONFIGURING FRAME RELAY INTERWORKING 9

This chapter describes how to configure and monitor frame relay interworking from the command-line interface.



You configure frame relay from the `::frame-relay=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frame-relay=>` prompt.

**`configuration frame-relay`**

# CONFIGURING FRAME RELAY LINKS

You configure frame relay link parameters from the ::link=> prompt. From the ::root=> prompt, type the following command then press **ENTER** to display the ::link=> prompt.

**configuration frame-relay link**

## Adding a Frame Relay Link

From the ::link=> prompt, type the new command in the following format then press **ENTER**.

**new** <slot.port> [**-lmitype** (**LMI**|**ANNEXA**|**ANNEXD**|**NONE**)]
[**-pollinterval** <int>] [**-enqinterval** <int>] [**-errthreshold** <val>]
[**-monevents** <val>]

### Parameters

<slot.port>

The channel card slot and port (format *slot.port*).

[**-lmitype** (**LMI**|**ANNEXA**|**ANNEXD**|**NONE**)]

The LMI (Local Management Interface) type defines a method of exchanging status information between the customer device and the network. The options are:

**LMI**—LMI Rev-1

**ANNEXA**—ITU 0.933 Annex-A

**ANNEXD**—ANSI T1 617 Annex-D

**NONE**—no LMI support

**If the LMI type is set to NONE, the poll interval, inquiry interval, error threshold, and monitor events parameters are not used.**

[**-pollinterval** <int>]

The poll interval value in seconds. Poll Interval is the number of seconds between LMI status inquiry messages. The valid range is 5 to 30, with 15 as the default.

[**-enqinterval** <int>]

The inquiry interval value. Inquiry interval is the number of poll intervals before a full status inquiry message is sent. The valid range is 1 to 255, with 6 as the default.

[**-errthreshold** <val>]

The error threshold value. Error threshold is the number of consecutive poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down. The valid range is 1 to 10, with 3 as the default.

[**-monevents** <val>]

The monitor events value. Monitor events is the number of poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down. The valid range is 1 to 10, with 4 as the default.

### Example

```
::link=> new 5.1 -lmitype LMI -pollinterval 15 -enqinterval 6
-errthreshold 3 -monevents 4
```

## Modifying Frame Relay Link Settings

From the `::link=>` prompt, type the set command in the following format then press **ENTER**.

**set** <slot.port> [**-lmitype** (**LMI|ANNEXA|ANNEXD|NONE**)]
[**-pollinterval** <int>] [**-enqinterval** <int>] [**-errthreshold** <val>]
[**-monevents** <val>]

### Parameters

<slot.port>

The channel card slot and port (format *slot.port*).

### [**-lmitype** (**LMI|ANNEXA|ANNEXD|NONE**)]

The LMI (Local Management Interface) type defines a method of exchanging status information between the customer device and the network. The options are:

**LMI**—LMI Rev-1

**ANNEXA**—ITU 0.933 Annex-A

**ANNEXD**—ANSI T1 617 Annex-D

**NONE**—no LMI support

**If the LMI type is set to NONE, the poll interval, inquiry interval, error threshold, and monitor events parameters are not used.**

### [**-pollinterval** <int>]

The poll interval value in seconds. Poll Interval is the number of seconds between LMI status inquiry messages. The valid range is 5 to 30, with 15 as the default.

### [**-enqinterval** <int>]

The inquiry interval value. Inquiry interval is the number of poll intervals before a full status inquiry message is sent. The valid range is 1 to 255, with 6 as the default.

### [**-errthreshold** <val>]

The error threshold value. Error threshold is the number of consecutive poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down. The valid range is 1 to 10, with 3 as the default.

### [**-monevents** <val>]

The monitor events value. Monitor events is the number of poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down. The valid range is 1 to 10, with 4 as the default.

### Example

```
::link=> set 5.1 -lmitype LMI -pollinterval 15 -enqinterval 6
-errthreshold 3 -monevents 5
```

## Deleting Frame Relay Links

**Before deleting a frame relay configuration, you must first delete all the circuit configurations under that link.**

1. From the ::link=> prompt, type **show** then press **ENTER** to display the configured links.
2. Note the index number of the frame relay link you want to delete.
3. From the ::link=> prompt, type the delete command in the following format then press **ENTER** to delete the link.

   **delete** <slot.port>

### Parameters

<slot.port>

The channel card slot and port (format *slot.port*) of the frame relay link you want to delete.

### Example

::link=> **delete 5.1**

## Displaying Frame Relay Link Settings

From the `::link=>` prompt, type the show command in the following format then press **ENTER**.

**show** [<slot.port>]

### Parameter

[<slot.port>]

The channel card slot and port (format *slot.port*) for which you want to display the configuration. Omitting this parameter displays the configurations for all configured IDSL channels.

### Examples

::link=> **show 5.1**

::link=> **show**

The following screen illustrates an example of both show frame-relay commands.

```
::link=> show 5.1

Link     State      PollInt    FullEnqInt ErrThreshold MonEvents
5.1      NONE       15         20         3            4


::link=> show

Link     State      PollInt    FullEnqInt ErrThreshold MonEvents
5.1      NONE       15         20         3            4
5.2      ANNEXA     15         20         5            5
5.4      LMI        10         20         3            4
```

| Status Box | Description |
|---|---|
| Link | The channel card slot and port (format *slot.port*). |
| State | The LMI (Local Management Interface) type, which defines a method of exchanging status information between the customer device and the network. The options are:<br>LMI—LMI Rev-1<br>ANNEXA—ITU 0.933 Annex-A<br>ANNEXD—ANSI T1 617 Annex-D<br>NONE—no LMI support<br>If the LMI type is set to NONE, the poll interval, inquiry interval, error threshold, and monitor events parameters are not used. |
| PollInt | The poll interval value, which is the number of seconds between LMI status inquiry messages (range: 5-30). |
| FullEnqInt | The enquiry interval value, which is the number of poll intervals before a full status inquiry message is sent (range: 1-255). |
| ErrThreshold | The error threshold value, which is the number of consecutive poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down (range: 1-10). |
| MonEvents | The monitor events value, which is the number of poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down (range: 1-10). |

# CONFIGURING FRAME RELAY FRF.8 CIRCUITS

FRF.8 defines how frames are translated between ATM and frame devices.

You configure frame relay FRF.8 circuit parameters from the `::frf8=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frf8=>` prompt.

**`configuration frame-relay frf8`**

## Adding a Frame Relay FRF.8 Circuit

From the `::frf8=>` prompt, type the new command in the following format then press **ENTER**. The index number and the frame relay VPI/VCI on the frame card are automatically assigned.

```
new <fslot.port> <dlci> <lslot.port> <lvpi> <lvci>
[-admin (up|down)] [-lpmode (1|2)] [-lpvalue (0|1)]
[-cimode (1|2)] [-demode (1|2)] [-devalue (0|1)] [-CIR <value>]
[-Be <value>] [-Bc <value>] [-type (ubr|cbr|nrt-vbr|rt-vbr)]
```

### Parameters

`<fslot.port>`

The frame card slot and port.

`<dlci>`

The DLCI (Data Link Connection Identifier) is the logical channel a data frame travels from the transmitted device to the destination device. The valid range is 16 to 991.

`<lslot.port>`

The line card slot and port (format *slot.port*).

`<lvpi>`

The ATM VPI of the frame relay (fr) VCC between the frame channel card and the line card.

`<lvci>`

The ATM VCI of the fr VCC between the frame channel card and the line card.

**[-admin (up|down)]**

The administrative status of the line. **up** activates the port, **down** deactivates the port.

**[-lpmode (1|2)]**

The LP mode determines the content of the ATM CLP (Cell Loss Priority) field when translating from frame relay to ATM.

**1**—The frame relay header DE (Discard Eligibility) field is mapped into the ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 (ATM Adaptation Layer Type 5) PDU (Protocol Data Unit) containing the information for that frame.

**2**—The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the LP value.

**[-lpvalue (0|1)]**

The LP Value determines the content of the ATM cell CLP field when the LP mode is set to **2**.

**0**—The network cannot discard cells.

**1**—The network can discard cells.

**[-cimode (1|2)]**

The CI Mode determines the content of the ATM EFCI (Explicit Forward Congestion Indicator) field.

**1**—The frame relay FECN (Forward Explicit Congestion Notification) field is mapped to the ATM EFCI field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame. This mode provides congestion indication to the end points, where higher-level protocol entries might be involved in traffic control mechanisms.

**2**—The ATM EFCI field is set to "congestion not experienced."

**[-demode (1|2)]**

The DE mode determines the content of the frame relay DE field when transmitting from ATM to frame relay.

**1**—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set.

**2**—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set to the DE value.

`[`**`-devalue`**` (`**`0`**`|`**`1`**`)]`

The DE value determines the content of the frame relay DE field when the DE mode is set to **`2`**.

**`0`**—The network cannot discard frames.

**`1`**—The network can discard frames.

`[`**`-CIR`**` <value>]`

The committed information rate (circuit throughput) in seconds. The valid range is 0 to 144000, with 0 as the default.

`[`**`-Be`**` <value>]`

The excess burst is the maximum number of uncommitted data bits that the network will attempt to deliver. The valid range is 0 to 144000, with 144000 as the default.

`[`**`-Bc`**` <value>]`

Committed burst is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval. The valid range is 0 to 144000, with 0 as the default.

`[`**`-type`**` (`**`ubr`**`|`**`cbr`**`|`**`nrt-vbr`**`|`**`rt-vbr`**`)]`

The type determines the traffic class.

**`ubr`** (Unspecified Bit Rate)—This is a best-effort class of traffic that is best suited for LAN. When network congestion occurs, the data is stored in a buffer until it can be sent.

**`cbr`** (Constant Bit Rate)—This traffic class carries a guaranteed constant bandwidth. It is best suited for applications that require fixed bandwidth, such as uncompressed voice, video, and circuit emulation. CBR is a Quality of Service class defined by the ATM Forum for ATM network.

**`nrt-vbr`** (non-real-time Variable Bit Rate)—This traffic class carries variable bandwidth. It is well suited for data services such as frame relay over ATM which requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.

**`rt-vbr`** (real-time Variable Bit Rate)—This traffic class carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video which require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.

### Example

```
::frf8=> new 5.1 16 2.1 0 100 -admin up -lpmode 1 -lpvalue 0
-cimode 1 -demode 1 -devalue 0 -CIR 0 -Be 144000 -Bc 0 -type ubr
```

## Modifying Frame Relay FRF.8 Circuit Parameters

You can modify a subset of the parameters that you configured when creating the frame relay circuit.

1 From the `::frf8=>` prompt, type **show** then press **ENTER** to display the configured circuits.

2 Note the index number of the frame relay FRF.8 circuit configuration you want to modify.

3 From the `::frf8=>` prompt, type the set command in the following format then press **ENTER**.

```
set <index> [-admin (up|down)] [-lpmode (1|2)]
[-lpvalue (0|1)] [-cimode (1|2)] [-demode (1|2)]
[-devalue (0|1)] [-CIR <value>] [-Be <value>] [-Bc <value>]
```

### Parameters

`<index>`

The index number of the frame relay FRF.8 circuit you want to modify.

`[-admin (up|down)]`

The administrative status of the line. **up** activates the port, **down** deactivates the port.

`[-lpmode (1|2)]`

The LP mode determines the content of the ATM CLP field when translating from frame relay to ATM.

**1**—The frame relay header DE field is mapped into the ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information for that frame.

**2**—The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the LP value.

`[-lpvalue (0|1)]`

The LP Value determines the content of the ATM cell CLP field when the LP mode is set to **2**.

**0**—The network cannot discard cells.

**1**—The network can discard cells.

**[-cimode (1|2)]**

The CI Mode determines the content of the ATM EFCI field.

**1**—The frame relay FECN field is mapped to the ATM EFCI field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame. This mode provides congestion indication to the end points, where higher-level protocol entries might be involved in traffic control mechanisms.

**2**—The ATM EFCI field is set to "congestion not experienced."

**[-demode (1|2)]**

The DE Mode determines the content of the frame relay DE field when transmitting from ATM to frame relay.

**1**—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set.

**2**—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set to the DE value.

**[-devalue (0|1)]**

The DE Value determines the content of the frame relay DE field when the DE mode is set to **2**.

**0**—The network cannot discard frames.

**1**—The network can discard frames.

[-**CIR** <value>]

The committed information rate (circuit throughput) value in seconds. The valid range is 0 to 144000, with 0 as the default.

[-**Be** <value>]

The excess burst value is the maximum number of uncommitted data bits that the network will attempt to deliver. The valid range is 0 to 144000, with 144000 as the default.

[-**Bc** <value>]

Committed burst is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval. The valid range is 0 to 144000, with 0 as the default.

### Example

```
::frf8=> set 1 -demode 2 -devalue 1
```

## Deleting Frame Relay FRF.8 Circuits

1. From the `::frf8=>` prompt, type **`show`** then press **ENTER** to display the configured circuits.
2. Note the index number of the frame relay FRF.8 circuit you want to delete.
3. From the `::frf8=>` prompt, type the delete command in the following format then press **ENTER** to delete the circuit.

   **`delete`** `<index>`

### Parameters

`<index>`

The index number of the frame relay FRF.8 circuit you want to delete.

### Example

`::frf8=>` **`delete 3`**

## Displaying Frame Relay FRF.8 Circuit Settings

From the `::frf8=>` prompt, type **`show`** then press **ENTER**.

### Examples

`::frf8=>` **`show`**

The following screen illustrates an example of the show command.

```
::frf8=> show

Idx Fport DLCI Lp Vpi Vci  Admn LpM LpV CiM DeM DeV CIR     Be      Bc      TPIx
1   5.1   16   2  128 250  up   1   1   1   1   0   1       144000  0       1
```

| Status Box | Description |
|---|---|
| Idx | The index number of the frame relay FRF.8 circuit. |
| Fport | The frame card slot and port number in the format *slot.port*. For example, slot 4 port 1 would be 4.1. |
| DLCI | The Data Link Connection Identifier (range: 16-991). |
| Lp | The line card slot and port number in the format *slot.port*. |
| Vpi | The fr VPI of the fr VCC between the frame channel card and the line card. |
| Vci | The fr VCI of the fr VCC between the frame channel card and the line card. |
| Admn | The administrative status of the line: up (activated) or down (deactivated). |
| LpM | The LP mode, which determines the content of the ATM CLP field when translating from frame relay to ATM.<br>1—The frame relay header DE field is mapped into the ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information for that frame.<br>2—The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the LP value. |
| LpV | The LP value, which determines the content of the ATM cell CLP field when the LP mode is set to 2.<br>0—The network cannot discard cells.<br>1—The network can discard cells. |
| CiM | The CI mode, which determines the content of the ATM EFCI field.<br>1—The frame relay FECN field is mapped to the ATM EFCI field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame. This mode provides congestion indication to the end points, where higher-level protocol entries might be involved in traffic control mechanisms.<br>2—The ATM EFCI field is set to "congestion not experienced." |

| Status Box | Description |
|---|---|
| DeM | The DE mode, which determines the content of the frame relay DE field when transmitting from ATM to frame relay.<br>1—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set.<br>2—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set to the DE value. |
| DeV | The DE value, which determines the content of the frame relay DE field when the DE mode is set to 2.<br>0—The network cannot discard frames.<br>1—The network can discard frames. |
| CIR | The committed information rate (circuit throughput) value in seconds (range: 0-144000) |
| Be | The excess burst value, which is the maximum number of uncommitted data bits that the network will attempt to deliver (range: 0-144000). |
| Bc | The committed burst value, which is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval (range: 0-144000). |
| TPIx | The traffic profile index. |

# CONFIGURING FRAME RELAY FRF.5 CIRCUITS

FRF.5 defines how frames are encapsulated so that they can be carried by the ATM network to another frame device.

You configure frame relay FRF.5 circuit parameters from the `::frf5=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frf5=>` prompt.

**`configuration frame-relay frf5`**

## Adding a Frame Relay FRF.5 Circuit

From the `::frf5=>` prompt, type the new command in the following format then press **ENTER**. The index number and the VPI/VCI on the frame card are automatically assigned.

**new** <fslot.port> <dlci> <lslot.port> <lvpi> <lvci> [**-admin** (**up**|**down**)] [**-txlpmode** (**1**|**2**)] [**-clpmask** (**0**|**1**)] [**-rxlpmode** (**1**|**2**)] [-**CIR** <value>] [-**Be** <value>] [-**Bc** <value>] [**-type** (**ubr**|**cbr**|**nrt-vbr**|**rt-vbr**)]

### Parameters

`<fslot.port>`

The frame card slot and port.

`<dlci>`

The DLCI (Data Link Connection Identifier) is the logical channel a data frame travels from the transmitted device to the destination device. The valid range is 16 to 991.

`<lslot.port>`

The line card slot and port (format *slot.port*).

`<lvpi>`

The frame relay (fr) VPI of the fr VCC between the frame channel card and the line card.

`<lvci>`

The fr VCI of the fr VCC between the frame channel card and the line card. When using the range command, the first fr PVC is assigned the fr VCI you specify for this parameter. Each additional fr PVC is assigned the next sequential fr VCI.

[**-admin** (**up**|**down**)]

The administrative status of the line. **up** activates the port, **down** deactivates the port.

[**-txlpmode** (**1**|**2**)]

The Tx LP mode determines the content of the FR-SSCS (Frame Relay - Service Specific Convergence Sublayer) PDU header DE and ATM cell ATM CLP fields.

**1**—The frame header DE field is copied in the FR-SSCS PDU header DE field and mapped into the ATM CLP field of every ATM cell generated by the frame.

**2**—The frame header DE field is copied into the FR-SSCS PDU header DE field. The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the CLP mask value.

[**-clpmask** (**0**|**1**)]

The CLP Mask determines the content of the ATM cell CLP field when the Tx LP mode is set to **2**.

**0**—The network cannot discard cells.

**1**—The network can discard cells.

[**-rxlpmode** (**1**|**2**)]

The Rx LP mode determines the loss priority settings when transmitting from ATM to frame relay.

**1**—The frame relay header DE field is set if the CLP field of one or more ATM cells of a frame is set to 1 or if the FR-SSCS PDU header DE field is set to 1.

**2**—The frame relay header DE field is copied into the FR-SSCS PDU header DE field, independent of the ATM CLP field value received.

[**-CIR** <value>]

The committed information rate (circuit throughput) value in seconds. The valid range is 0 to 144000, with 0 as the default.

[**-Be** <value>]

The excess burst value is the maximum number of uncommitted data bits that the network will attempt to deliver. The valid range is 0 to 144000, with 144000 as the default.

[**-Bc** <value>]

Committed burst is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval. The valid range is 0 to 144000, with 0 as the default.

[**-type** (**ubr**|**cbr**|**nrt-vbr**|**rt-vbr**)]

The type determines the traffic class.

**ubr** (Unspecified Bit Rate)—This is a best-effort class of traffic that is best suited for LAN. When network congestion occurs, the data is stored in a buffer until it can be sent.

**cbr** (Constant Bit Rate)—This traffic class carries a guaranteed constant bandwidth. It is best suited for applications that require fixed bandwidth, such as uncompressed voice, video, and circuit emulation. CBR is a Quality of Service class defined by the ATM Forum for ATM network.

**nrt-vbr** (non-real-time Variable Bit Rate)—This traffic class carries variable bandwidth. It is well suited for data services such as frame relay over ATM that requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.

**rt-vbr** (real-time Variable Bit Rate)—This traffic class carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video that require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.

### Example

```
::frf5=> new 5.1 16 2.1 128 250 -admin up -txlpmode 1 -clpmask 0
-rxlpmode 1 -CIR 0 -Be 144000 -Bc 0 -type ubr
```

## Modifying Frame Relay FRF.5 Circuit Parameters

You can modify a subset of the parameters that you configured when creating the frame relay circuit.

1 From the `::frf5=>` prompt, type **show** then press **ENTER** to display the configured circuits.

2 Note the index number of the frame relay FRF.5 circuit configuration you want to modify.

3 From the `::frf5=>` prompt, type the set command in the following format then press **ENTER**.

```
set <index> [-admin (up|down)] [-txlpmode (1|2)]
[-clpmask (0|1)] [-rxlpmode (1|2)][-CIR <value>]
[-Be <value>] [-Bc <value>]
```

### Parameters

`<index>`

The index number of the frame relay FRF.5 circuit you want to modify.

**[-admin (up|down)]**

The administrative status of the line. **up** activates the port, **down** deactivates the port.

[**-txlpmode** (**1**|**2**)]

The Tx LP mode determines the content of the FR-SSCS PDU header DE and ATM cell ATM CLP fields.

**1**—The frame header DE field is copied in the FR-SSCS PDU header DE field and mapped into the ATM CLP field of every ATM cell generated by the frame.

**2**—The frame header DE field is copied into the FR-SSCS PDU header DE field. The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the CLP mask value.

[**-clpmask** (**0**|**1**)]

The CLP Mask determines the content of the ATM cell CLP field when the Tx LP mode is set to **2**.

**0**—The network cannot discard cells.

**1**—The network can discard cells.

[**-rxlpmode** (**1**|**2**)]

The Rx LP mode determines the loss priority settings when transmitting from ATM to frame relay.

**1**—The frame relay header DE field is set if the CLP field of one or more ATM cells of a frame is set to 1 or if the FR-SSCS PDU header DE field is set to 1.

**2**—The frame relay header DE field is copied into the FR-SSCS PDU header DE field, independent of the ATM CLP field value received.

[-**CIR** <value>]

The circuit throughput (committed information rate) value in seconds. The valid range is 0 to 144000, with 0 as the default.

[-**Be** <value>]

The excess burst is the maximum number of uncommitted data bits that the network will attempt to deliver. The valid range is 0 to 144000, with 144000 as the default.

[-**Bc** <value>]

The committed burst is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval. The valid range is 0 to 144000, with 0 as the default.

### Example

```
::frf5=> set 2 -admin down -txlpmode 2 -clpmask 0
```

## Deleting Frame Relay FRF.5 Circuits

1. From the `::frf5=>` prompt, type **`show`** then press ENTER to display the configured circuits.
2. Note the index number of the frame relay FRF.5 circuit you want to delete.
3. From the `::frf5=>` prompt, type the delete command in the following format then press ENTER to delete the circuit.

   **`delete`** `<index>`

### Parameters

`<index>`

The index number of the frame relay FRF.5 circuit you want to delete.

### Example

```
::frf5=> delete 3
```

## Displaying Frame Relay FRF.5 Circuit Settings

From the `::frf5=>` prompt, type **show** then press **ENTER**.

### Examples

`::frf5=>` **show**

The following screen illustrates an example of the show command.

```
::frf5=> show

Idx Fport DLCI Lp Vpi Vci  Admn TxLpM CLPM RxLpM CIR     Be      Bc      TPIx
```

| Status Box | Description |
|---|---|
| Idx | The index number of the frame relay FRF.5 circuit. |
| Fport | The frame card slot and port number in the format *slot.port*. For example, slot 4 port 1 would be 4.1. |
| DLCI | The Data Link Connection Identifier (range: 16-991). |
| Lp | The line card slot and port number in the format *slot.port*. |
| Vpi | The fr VPI of the fr VCC between the frame channel card and the line card. |
| Vci | The fr VCI of the fr VCC between the frame channel card and the line card. |
| Admn | The administrative status of the line: up (activated) or down (deactivated). |

| Status Box | Description |
|---|---|
| TxLpM | The Tx LP mode, which determines the content of the FR-SSCS PDU header DE and ATM cell ATM CLP fields.<br>1—The frame header DE field is copied in the FR-SSCS PDU header DE field and mapped into the ATM CLP field of every ATM cell generated by the frame.<br>2—The frame header DE field is copied into the FR-SSCS PDU header DE field. The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the CLP mask value. |
| CLPM | The CLP Mask setting, which determines the content of the ATM cell CLP field when Tx LP mode is set to 2.<br>0—The network cannot discard cells.<br>1—The network can discard cells. |
| RxLpM | The Rx LP mode, which determines the loss priority settings when transmitting from ATM to frame relay.<br>1—The frame relay header DE field is set if the CLP field of one or more ATM cells of a frame is set to 1 or if the FR-SSCS PDU header DE field is set to 1.<br>2—The frame relay header DE field is copied into the FR-SSCS PDU header DE field, independent of the ATM CLP field value received. |
| CIR | The committed information rate (circuit throughput) value in seconds (range: 0-144000) |
| Be | The excess burst value, which is the maximum number of uncommitted data bits that the network will attempt to deliver (range: 0-144000). |
| Bc | The committed burst value, which is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval (range: 0-144000). |
| TPIx | The traffic profile index. |

# CONFIGURING BRIDGING AND ROUTING 10

This chapter describes how to create bridging and routing sessions and configure system bridging and routing parameters through the command-line interface.

# CONFIGURING BRIDGING AND ROUTING SESSIONS

You can configure bridging and routing sessions using PVCs that terminate on the management card (for example, PVCs between ADSL cards and the management card or PVCs between OC3 line cards and the management card). You can configure 96 bridging and routing sessions.

To configure a bridging or routing session, you configure a PVC between a line or channel card and the management card, then set up the desired service for the session (bridging, routing or both). The system automatically assigns the management card VPI and VCI for each session. If you are configuring a session using a frame-based card, the system automatically assigns the VPI and VCI and configures the session to use VC-MUX_Bridged encapsulation mode.

You configure sessions using the command-line interface from the `::session=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::session=>` prompt.

**`configuration atm session`**

## Adding Sessions

From the `::session=>` prompt, type the new command in the following format then press **ENTER**.

```
new <slot.port> <vpi|*> <vci|*> <(llc-snap|vcmuxbr|vcmuxrt)>
[-dlci <dlci>] [-subs <subscriber>] [-service
(bridge|{{route|broute} -ipaddr <ipaddr> -mask <ipmask>})]
[-stppri <priority>] [-stpcost <cost>][-admin (up|down)]
```

### Parameters

`<slot.port>`

The line or channel card slot and port you want to use for this PVC.

`<vpi|*>`

The VPI you want to use for this PVC. Type ***** if you are using an SDSL channel card for the PVC, as the system automatically assigns the VPI in this case.

`<vci|*>`

The VCI you want to use for this PVC. Type ***** if you are using an SDSL channel card for the PVC, as the system automatically assigns the VCI in this case.

`<dlci>`

The DLCI (Data Link Connection Identifier) of the frame relay circuit you want to use for this session.

`<(`**`llc-snap|vcmuxbr|vcmuxrt`**`)>`

The encapsulation mode you want to use for this PVC. The type of service specified for the `-service` parameter determines the appropriate encapsulation modes. In addition, the configured encapsulation mode must match the encapsulation mode used by the adjacent segments in the network.

| If you specified service type: | Set the encapsulation mode to: |
|---|---|
| broute | llc-snap |
| route | llc-snap or vcmuxrt |
| bridge | for SDSL—vcmuxbr<br>for all other cards—vcmuxbr or llc-snap |

[**-subs** <subscriber>]

A name that identifies the session. This is a text string that can be up to 32 characters in length and can contain any character.

[**-service** (**bridge**|{{**route**|**broute**} **-ipaddr** <ipaddr> **-mask** <ipmask>})]

**bridge**

Configures the session for bridging only.

**route**

Configures the session for routing only.

**broute**

Configures the session for both bridging and routing.

**-ipaddr** <ipaddr>

The IP address assigned to the session (format *xxx.xxx.xxx.xxx*). Include this parameter only if you specified **route** or **broute** for the service type.

**-mask** <ipmask>

The subnet mask assigned to the session (format *xxx.xxx.xxx.xxx*). Include this parameter only if you specified **route** or **broute** for the service type.

[**-stppri** <priority>]

Omit this parameter if you specified **route** for the service type. This parameter sets the STP priority for the session. The valid range is from 0 to 255, with 0 being the highest priority. The default value is 128.

[**-stpcost** <cost>]

Omit this parameter if you specified **route** for the service type. This parameter sets the STP path cost for the session. The valid range is from 1 to 65535. The value 1 is the lowest cost, reflecting the greatest efficiency. The default value is 250 for WAN ports and 100 for LAN ports.

[-**admin** (**up**|**down**)]

The admin status of the session. **Up** enables the session. **Down** disables the session.

### Examples

::session=> **new 4.2 100 100 llc-snap -subs company123 -service broute -ipaddr 10.0.1.9 -mask 255.0.0.0 -admin up**

::session=> **new 4.2 100 100 vcmuxbr -subs company-a -service bridge -stppri 128 -stpcost 250 -admin down**

## Modifying Sessions

From the ::session=> prompt, type the modify command in the following format then press ENTER.

**modify** <index> [-**admin** (**up**|**down**)][**-subs** <subscriber>] [**-service** (**bridge|**{{**route**|**broute**} [**-ipaddr** <ipaddr> **-mask** <ipmask>]}**|none**)] [-encap(**llc-snap**|**vcmuxbr**|**vcmuxrt**)][**-stppri** <priority>] [**-stpcost** <cost>]

### Parameters

`<index>`

The index number of the Session Configuration Table row that contains the session you want to modify.

[-**admin** (**up**|**down**)]

The admin status of the session. **Up** enables the session. **Down** disables the session.

[**-subs** <subscriber>]

A name that identifies the session. This is a text string that can be any length and can contain any character.

[**-service** (**bridge**|{{**route**|**broute**} [**-ipaddr** <ipaddr> **-mask** <ipmask>]}|**none**)]

**bridge**

Configures the session for bridging only.

**route**

Configures the session for routing only.

**broute**

Configures the session for both bridging and routing.

**-ipaddr** <ipaddr>

The IP address assigned to the session (format *xxx.xxx.xxx.xxx*). Include this parameter only if you specified **route** or **broute** for the service type.

**-mask** <ipmask>

The subnet mask assigned to the session (format *xxx.xxx.xxx.xxx*). Include this parameter only if you specified **route** or **broute** for the service type.

**none**

Assigns no service to the session.

[-encap(**llc-snap|vcmuxbr|vcmuxrt**)]

The encapsulation mode you want to use for this PVC. The type of service specified for the `-service` parameter determines the appropriate encapsulation modes. In addition, the configured encapsulation mode must match the encapsulation mode used by the adjacent segments in the network.

| If you specified service type: | Set the encapsulation mode to: |
|---|---|
| broute | llc-snap |
| route | llc-snap or vcmuxrt |
| bridge | for SDSL—vcmuxbr<br>for all other cards—vcmuxbr or llc-snap |

[**-stppri** <priority>]

Omit this parameter if you specified **`route`** or **`broute`** for the service type. This parameter sets the STP priority for the session. The valid range is from 0 to 255, with 0 being the highest priority. The default value is 128.

[**-stpcost** <cost>]

Omit this parameter if you specified **`route`** or **`broute`** for the service type. This parameter sets the STP path cost for the session. The valid range is from 1 to 65535. The value 1 is the lowest cost, reflecting the greatest efficiency. The default value is 250 for WAN ports and 100 for LAN ports.

### Example

```
::session=> modify 2 -admin down -subs company123 -service broute
-ipaddr 10.0.1.9 -mask 255.0.0.0 -encap llc-snap -stppri 128
-stpcost 250
```

## Displaying Sessions

To verify your session configuration, from the `::session=>` prompt, type the **`show`** command as follows then press **ENTER**.

**`show`** `[<slot>]`

### Parameter

`[<slot>]`

The slot number for which you want to display the session configurations. Omitting this parameter displays all session configurations.

### Examples

`::session=>` **`show`**

`::session=>` **`show 2`**

A screen similar to the following displays.

```
::session=> show

Service Types  Ser:  Bridging-B; Routing-R; BRouting-BR; None-N

Encap_Types  Encap:  LLCSNAP-LLC; VcMuxBr-VcB; VcMuxRt-VcR
                                                                        STP
Idx St Pt  Vpi  Vci  Sub        Admin Oper Ser  IpAddr     Encap    Pri  Cost
1   1  1   0    1    AMC        up    up   R    10.0.11.37 n/a      n/a  n/a
2   2  2   0    145  Company A  up    up   BR   10.0.1.9   LLC      0    250
```

The first row of the Session Configuration Table displays information for a session that connects the management card to the ATM network. The VPI and VCI for this session are assigned internally.

| Information | Description |
|---|---|
| Idx | The Session Configuration Table row index number. |
| St<br>Pt | The slot and port on which the session is configured. |
| Vpi<br>Vci | The session VPI and VCI. For SDSL sessions, the VPI and VCI value is n/a. |
| Sub | A name assigned to identify the session. |
| Admin | The administrative status of the session. Up indicates the session is enabled. Down indicates the session is disabled. |
| Oper | The operational status of the session. Up indicates the session is operational and passing data. Down indicates the session is not operational. |
| Ser | The type of service configured for the session. Options:<br>• B—bridging<br>• R—routing<br>• BR—both bridging and routing<br>• N/A—no service |
| IpAddr | The IP address of the management card logical port or WAN address used for the session (routing sessions only). |
| Encap | The configured encapsulation mode. Options:<br>• LLC—LLC-SNAP<br>• VcB—Vc Mux Bridged<br>• VcR—Vc Mux Routed |
| Pri | The Spanning Tree Protocol priority of the session. The range is from 0 to 255, with 0 being the highest priority. The default is 128. |
| STP Cost | The Spanning Tree Protocol path cost of the session. The valid range is 1 to 65535, with 1 being the lowest cost. The default value is 250 for WAN ports and 100 for LAN ports. |

## Deleting Sessions

1. From the `::session=>` prompt, type **`show`** then press **ENTER** to display the configured sessions.
2. Note the index number of the Session Configuration Table row you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **`delete`** `<index>`

### Parameter

`<index>`

The Session Configuration Table row index number of the session you want to delete.

### Example

`::session=>` **`delete 2`**

# CONFIGURING IP ROUTING

The IP Routing Table contains the information that is used by the management card to route data. Packets for which the network portion of the destination IP address match the IP address listed in the first column of the table are routed based on the data displayed in the corresponding table row.

You configure IP routing from the `::routingtb=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::routingtb=>` prompt.

**`configuration routing routingtb`**

## Adding IP Routing Table Entries

From the `::routingtb=>` prompt type the new command in the following format, then press **ENTER**.

**new** <destip> <nexthop> [**-hopcount** <hopcount>]

### Parameters

<destip>

The IP address to which packets must be sent to qualify for routing based on this IP Routing Table entry.

<nexthop>

The IP address of the next router in the network to which the packet is to be forwarded.

[**-hopcount** <hopcount>]

The number of hops the packet is allowed to make to get to its destination. If the packet makes the maximum number of hops allowed by the RIP configuration (see "Modifying RIP Configuration" on page 242), and is not yet at its destination, it is deleted.

### Example

::routingtb=> **new 100.90.57.3 100.90.57.4 -hopcount 10**

## Displaying the IP Routing Table

To verify your IP routing configuration, from the `::routingtb=>` prompt, type the **show** command as follows then press **ENTER**.

**show** [<ipaddr>]

### Parameter

[<ipaddr>]

The IP address of the IP Routing Table entry you want to display (format *xxx.xxx.xxx.xxx*). Omitting this parameter displays all IP Routing Table entries.

### Examples

`::routingtb=>` **`show`**

`::routingtb=>` **`show 10.0.0.0`**

A screen similar to the following displays.

```
::routingtb=> show

Route Types Ty: D-Direct; I-Indirect; O-Other; IV-Invalid
Protocol Types Pr: L-Local; -Network Mgnt; R-Rip; O-Other
Column Headers: Sl-Slot; Po-Port; Hop-HopCount; Ty-Route Types; Pr-Protocol

Index  DestIp     Mask        NextHop      Sl  Po  Vpi   Vci  Hop   Ty  Pr  Age

1      10.0.0.0   255.0.0.0   10.0.11.37   0    0    0    0    3    D  L    4152
2      95.0.0.0   255.0.0.0   10.0.5.1     0    0    0    0    3    D  L    424
```

| Information | Description |
|---|---|
| Index | The index number of the IP Routing Table row. |
| DestIp | The IP address of the routing entry. |
| Mask | The subnet mask used to specify what portion of the IP address is considered when determining whether to route the packet based on the data in this table row. |
| NextHop | The IP address of the next router in the network to which the packet is to be forwarded. |
| Sl<br>Po | The slot and port of the session over which the packet is routed. |
| Vpi<br>Vci | The VPI and VCI of the session over which the packet is routed. |
| Hop | The number of hops the packet is allowed to make to get to its destination. This value is used by the RIP. If the packet makes the maximum allowable hops and is not yet at its destination, it is deleted. |
| Ty | The type of routing connection. Options:<br>• D—Direct (local connection)<br>• I—Indirect (requires multiple hops)<br>• IV—Invalid (the route is invalid)<br>• O—Other (none of the above options) |
| Pr | Protocol - the method by which the IP Routing Table entry was learned. Options:<br>• L—Local (manually configured)<br>• R—RIP (learned dynamically)<br>• N—Network Management<br>• O—Other |
| Age | The number of seconds the IP Routing Table entry has been in the table. Learned entries are automatically deleted once their age exceeds the maximum, which is determined by the routing protocol. The maximum age under RIP is 180 seconds. Static routes must be configured manually. |

## Deleting IP Routing Table Entries

1. From the `::routingtb=>` prompt, type **`show`** then press **ENTER** to display the configured sessions.
2. Note the index number of the IP Routing Table entry you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **`delete`** `<index>`

#### Parameter

`<index>`

The IP Routing Table index number of the entry you want to delete.

#### Example

`::routingtb=>` **`delete 2`**

# CONFIGURING IP ARP

The IP ARP Table maps MAC addresses to IP addresses. The router builds this table by sending ARP requests to the destination IP addresses and learning the corresponding MAC addresses from the received responses. You can also enter information manually into the IP ARP Table.

You configure IP ARP from the `::arptb=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::arptb=>` prompt.

**`configuration routing arptb`**

## Adding IP ARP Table Entries

From the `::arptb=>` prompt type the new command in the following format, then press **ENTER**.

**new** <ipAddr> <macAddr>

#### Parameters

<ipAddr>

The IP address you want to map to a MAC address (format *xxx.xxx.xxx.xxx*).

<macAddr>

The MAC address you want to map to the IP address entered for the `<ipAddr>` parameter. The MAC address format is *xx:xx:xx:xx:xx:xx* where *x* is either a space, an integer ranging from 0 to 9 or a letter ranging from a to f.

#### Example

::arptb=> **new 10.0.10.20 08:00:20:9e:d4:33**

## Displaying the IP ARP Table

To verify your IP ARP configuration, from the `::arptb=>` prompt, type the **show** command as follows then press **ENTER**.

**show** [<ipaddr>]

#### Parameter

[<ipaddr>]

The IP address of the IP ARP Table entry you want to display (format *xxx.xxx.xxx.xxx*). Omitting this parameter displays all IP ARP Table entries.

#### Examples

::arptb=> **show**

::arptb=> **show 10.0.0.120**

A screen similar to the following displays.

```
::arptb=> show

Index  Slot Port   IPAddr               MacAddr            Type
1        1    1    10.0.0.120           00:10:4b:24:15:a3  dynamic
2        1    1    10.0.0.121           00:60:97:bd:eb:bb  dynamic
3        1    1    10.0.11.37           00:20:a7:10:00:52  static
```

| Information | Description |
|---|---|
| Index | The IP ARP Table row index number. |
| Slot<br>Port | The slot and port on which the IP ARP entry was learned. The management card is always installed in slot 1 and, currently, the management card only has one Ethernet port, therefore these values are always 1. |
| IPAddr | The IP address that is mapped to the corresponding MAC address. |
| MacAddr | The MAC address that is mapped to the corresponding IP address. |
| Type | The type of entry, either dynamic (learned) or static (entered manually). |

## Deleting IP ARP Table Entries

1 From the `::arptb=>` prompt, type **show** then press **ENTER** to display the configured sessions.

2 Note the index number of the IP ARP Table entry you want to delete.

3 Type the delete command in the following format then press **ENTER**.

**delete** <index>

### Parameter

<index>

The IP ARP Table index number of the entry you want to delete.

#### Example

```
::arptb=> delete 2
```

# MODIFYING RIP CONFIGURATION

The RIP Configuration Table displays information about the Routing Information Protocol (RIP) used for each routing session. You configure RIP information initially during session configuration, however you can modify it using the following procedures.

You modify RIP information from the `::rip=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::rip=>` prompt.

**`configuration routing rip`**

## Modifying RIP

1 From the `::rip=>` prompt, type **`show`** then press **ENTER** to display the RIP configuration for each session.

2 Note the index number of the RIP Configuration Table entry you want to modify.

3 Type the modify command in the following format, then press **ENTER**.

```
modify <index> [-send(ripv1c|ripv1|ripv2|donotsend)]
[-recv(ripv1|ripv2|v1orv2|donotrecv)] [-key <plain text
password>] [-auth none]
```

#### Parameters

`<index>`

The RIP Configuration Table index number of the entry you want to modify.

`[-send(ripv1c|ripv1|ripv2|donotsend)]`

- **ripv1c**—send RIP Version 1c packets only (RIP 2-type packets that are compatible with RIP 1)
- **ripv1**—send RIP Version 1 packets only
- **ripv2**—RIP Version 2 packets only
- **donotsend**—no RIP packets are sent

[**-recv**(**ripv1**|**ripv2**|**v1orv2**|**donotrecv**)]

- **ripv1**—receive RIP Version 1 packets only
- **ripv2**—receive RIP Version 2 packets only
- **v1orv2**—receive either RIP Version 1 or RIP Version 2 packets
- **donotrecv**—receive no RIP packets

[**-key** <plain text password>]

This parameter enables you to set a password, or key. The password allows the system to receive RIP table updates from remote routers. RIP updates only occur if the same password is used by the remote router. The password is used only for RIP version 2 packets; no password control is available for RIP version 1. Omit this parameter to prevent RIP updates from remote routers.

The password can be any length and can contain any keyboard character. Avidia supports only plain text passwords; MD5 password encoding is not supported.

[**-auth none**]

Include this parameter to disable the **key** parameter. If no **key** has been set, this parameter has no effect.

### Example

::rip=> **modify 2 -send ripv1c -recv v1orv2 -key admin**

## Displaying the RIP Configuration Table

To verify a session's RIP configuration, from the `::rip=>` prompt, type the **show** command as follows then press ENTER.

**show** [<ipaddr>]

### Parameter

[<ipaddr>]

The IP address of the RIP Configuration Table entry you want to display (format *xxx.xxx.xxx.xxx*). Omitting this parameter displays all RIP Configuration Table entries.

### Examples

`::rip=>` **`show`**

`::rip=>` **`show 10.0.0.120`**

A screen similar to the following displays.

```
::rip=> show

Index    IPAddr       Send      Receive       Hop Count   Authentication
1        10.0.11.37   ripv1c    v1orv2        5           No
```

| Information | Description |
|---|---|
| Index | The RIP Configuration Table row index number. |
| IPAddr | The IP address of the routing session. |
| Send | The type of RIP packets to be sent. The RIP type is determined by the RIP version used by the other routers in the network. The options are:<br>• donotsend (no RIP packets are sent)<br>• ripv1<br>• ripv1c (RIP2-type packets that are compatible with RIP 1)<br>• ripv2 |
| Receive | The type of RIP packets to be received. The options are:<br>• ripv1<br>• ripv2<br>• v1orv2<br>• donotreceive (no RIP packets are received) |
| Hop Count | The number of hops the packets are allowed to cross before arriving at their destination. |
| Authentication | Indicates whether a password is required to enable the router to learn information from the session ports in the same network segment. The options are No Authentication or Simple Password (text string). |

# CONFIGURING DESTINATION-MAC ADDRESS FILTERING (FORWARDING)

The Destination-MAC Address Filtering Table displays a list of ports from which frames may be received and the corresponding ports to which those frames are allowed to be forwarded.

You add Destination-MAC Address Filtering Table entries from the `::filter=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::filter=>` prompt:

**`configuration bridging filter`**

## Adding Destination-MAC Address Filtering Table Entries

From the `::filter=>` prompt type the new command in the following format, then press **ENTER**.

**`new`** `<macaddr> <srcport> <port,port,...>`

### Parameters

`<macaddr>`

The MAC address of the device for which the packet is destined. The MAC address format is *xx:xx:xx:xx:xx:xx* where *x* is either a space, an integer ranging from 0 to 9 or a letter ranging from a to f.

`<srcport>`

The source bridge session port.

`<port,port,...>`

The bridge session ports to which you want to allow frame forwarding from the specified source port. To specify multiple ports, separate each port number with a comma.

### Examples

`::filter=>` **`new 00:10:4b:24:15:a3 3 4,5,6,7,8`**

## Displaying the Destination-MAC Address Filtering Table

To verify filtering configuration, from the `::filter=>` prompt, type the **`show`** command as follows then press **ENTER**.

**`show`** `[<macaddr>]`

### Parameter

`[<macaddr>]`

The MAC address of the Destination-MAC Address Filtering Table entry you want to display (format *xx:xx:xx:xx:xx:xx*). Omitting this parameter displays all Destination-MAC Address Filtering Table entries.

### Examples

`::filter=>` **`show 00:10:4b:24:15:a3`**

`::filter=>` **`show`**

A screen similar to the following displays.

```
::filter=> show

Index        MacAddress           SourceBridgePort        DestBridgePort
1            00:10:4b:24:15:a3    3                       4,5,6,7,8
```

| Information | Description |
|---|---|
| Index | The Destination-MAC Address Filtering Table row index number. |
| MacAddress | The MAC address of the device for which the packet is destined. |
| SourceBridgePort | The logical bridge session port. |
| DestBridgePort | The logical bridge session ports to which the frame are allowed to be forwarded. |

## Deleting Destination-MAC Address Filtering Table Entries

1. From the `::filter=>` prompt, type **`show`** then press **ENTER** to display the configured sessions.
2. Note the index number of the Destination-MAC Address Filtering Table entry you want to delete.
3. Type the delete command in the following format then press **ENTER**.

   **`delete`** `<index>`

#### Parameter

`<index>`

The Destination-MAC Address Filtering Table index number of the entry you want to delete.

#### Example

`::filter=>` **`delete 2`**

# CONFIGURING SYSTEM BRIDGING PARAMETERS

You can configure several system-wide bridging parameters. Each parameter comes preconfigured with a default value, however you can modify each setting.

You modify system bridging parameters from the `::bridging=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::bridging=>` prompt.

**`configuration bridging`**

## Modifying System Bridging Parameters

From the `::bridging=>` prompt, type the modify command in the following format, then press **ENTER**.

**modify** [**-brenable** (**on**|**off**)] [**-wanbcenable** (**on**|**off**)] [**-age** <sec>]

### Parameters

[**-brenable** (**on**|**off**)]

Type **-brenable on** to enable bridging. Type **-brenable off** to disable bridging.

[**-wanbcenable** (**on**|**off**)]

Determines whether unknown WAN frames are broadcast to all WAN logical interfaces. Type **-wanbcenable on** to enable WAN broadcasting. Type **-wanbcenable off** to disable WAN broadcasting.

[**-age** <sec>]

Specifies the interval, in seconds, after which Bridging Table entries are deleted if they are not relearned. The valid range is 10 - 1000000. The default is 300 seconds.

## Displaying System Bridging Parameters

To verify system bridging configuration, from the `::bridge=>` prompt, type **show** then press **ENTER**. A screen similar to the following displays.

```
::bridge=> show

Bridging Enabled :                               enabled(1)

WAN Broadcast Enabled :                          enabled(1)

Aging Time (sec) :                               300
```

| Information | Description |
|---|---|
| Bridging Enabled | Indicates whether system bridging is enabled or disabled. |
| WAN Broadcast Enabled | Indicates whether unknown WAN frames are broadcast to all logical interfaces. |
| Aging Time (sec) | Specifies the interval, in seconds, after which Bridging Table entries are deleted if they are not relearned. |

# CONFIGURING SYSTEM STP PARAMETERS

You can configure several system-wide STP parameters. Each parameter comes preconfigured with a default value, however you can modify each setting.

You modify system STP parameters from the `::globalstp=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::globalstp=>` prompt.

**`configuration bridging globalstp`**

## Modifying System STP Parameters

From the `::globalstp=>` prompt, type the modify command in the following format, then press **ENTER**.

```
modify [-stpenable (on|off)] [-stppri <priority>][-maxage <sec>]
[-hellotime <sec>] [-fddelay <sec>]
```

### Parameters

**`[-stpenable (on|off)]`**

Enables or disables Spanning Tree Protocol. Type **`on`** to enable it. Type **`off`** to disable it.

**`[-stppri <priority>]`**

The priority of the system (the entire chassis) within the network. The valid range is 0 to 65535. The value 0 indicates the highest priority. The default value is 32768.

**`[-maxage <sec>]`**

The number of seconds after which entries in the Bridging Table will be deleted if they are not re-learned. The valid range is 6 to 40. The default value is 20.

[**-hellotime** <sec>]

The interval, in seconds, at which you want the system to send Spanning Tree Protocol packets. The valid range is 1 to 10. The default value is 2.

[**-fddelay** <sec>]

The number of seconds you want the system to wait before changing the state of a particular interface (changing to blocked, for example). The valid range is 4 to 30. The default value is 15.

This delay prevents the interface states from changing so rapidly that the STP cannot keep up with the current topology of the network and cannot therefore manage bridging efficiently.

### Example

```
::globalstp=> modify -stpenable on -maxage 20 -hellotime 2
-fddelay 15
```

## Displaying System STP Parameters

To verify system bridging configuration, from the `::globalstp=>` prompt, type **`show`** then press **ENTER**. A screen similar to the following displays.

```
::globalstp=> show
STP Enabled                                        : enabled(1)
STP Priority                                       : 32768
STP Bridge MaxAge (sec)                            : 20
STP Bridge Hello Time (sec)                        : 2
STP Bridge Forward Delay (sec)                     : 15
```

# CONFIGURING GLOBAL IP ROUTING SETTINGS

You configure global settings to enable IP routing and specify the time-to-live value for IP datagrams.

You configure global IP routing settings from the from the `::ip=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::ip=>` prompt:

**`configuration routing ip`**

## Configuring Global IP Routing Settings

From the `::ip=>` prompt, type the modify command as follows, then press **ENTER**.

**modify** [**-ipforward** (**enable**|**disable**)] [**ttl** <ttl>]

### Parameters

[**-ipforward** (**enable**|**disable**)]

Enables or disables IP forwarding. Type **-ip forward enable** to enable IP forwarding. Type **-ipforward disable** to disable IP forwarding.

[**ttl** <ttl>]

Sets the time-to-live value for internally-generated IP datagrams that do not contain a time-to-live value. The time-to-live value is the number of hops a packet is allowed to cross before it reaches it's destination. The default is 64.

## Displaying Global IP Routing Settings

From the `::ip=>` prompt, type show then press **ENTER**. A screen similar to the following displays.

```
::ip=> show

IP Forwarding  :       Enabled

Time To Live   :       64
```

# Configuring Subtended Systems 11

This chapter describes how to configure subtended systems from the command-line interface.



You configure which systems are subtended and subtending from the `::subtend=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::subtend=> prompt`.

**`configuration subtend`**

**This chapter describes how to configure an Avidia 2200 system for subtending. To configure other Avidia systems, see** **“Subtending Multiple Systems” on page 45****.**

# Adding a Subtended System

From the `::subtend=>` prompt, type the new command in the following format, then press **ENTER**.

**new** <slot.port> <**vpi**> <**vci**> **-srcipaddr** <**sourceipaddr**> **-dstipaddr** <**destipaddr**> **-mask** <**subnetmask**> **-parentipaddr** <**paripaddr**> **-parentslotport** <**pslot.pport**> [**-admin**(**up**|**down**)]

### Parameters

<slot.port>

The slot and port through which subtending occurs.

<**vpi**>

The VPI for in-band management.

<**vci**>

The VCI for in-band management.

**-srcipaddr** <**sourceipaddr**>

The IP address of the logical port on the subtending (source) chassis.

**-dstipaddr** <**destipaddr**>

The WAN IP address of the logical port on the subtended (destination) chassis.

**-mask** <**subnetmask**>

The subnet mask for the IP session.

**-parentipaddr** <**paripaddr**>

The IP address of the chassis to which the destination chassis is subtended.

**-parentslotport** <**pslot.pport**>

The channel card slot and port through which the destination chassis is subtended.

[**-admin**(**up**|**down**)]

Specifies the administrative status of the line. Type **-admin up** to activate the line. Type **-admin down** to deactivate it.

### Example

```
::subtend=> new 5.1 0 100 -srcipaddr 192.169.2.2 -dstipaddr
192.169.2.1 -mask 255.255.255.0 -parentipaddr 192.169.2.2
-parentslotport 5.1 -admin up
```

# MODIFYING A SUBTENDED SYSTEM CONFIGURATION

From the `::subtend=>` prompt, type the new command in the following format, then press **ENTER**.

```
modify <index> <vpi> <vci> -srcipaddr <sourceipaddr> -dstipaddr
<destipaddr> -mask <subnetmask> -parentipaddr <paripaddr>
-parentslotport <pslot.pport> [admin(up|down)]
```

### Parameters

`<index>`

The subtending table index number that is associated with the subtending configuration you want to modify. See “Displaying Subtending Information” on page 257 for information on the subtending table.

**`<vpi>`**

The VPI for in-band management.

**`<vci>`**

The VCI for in-band management.

**`-srcipaddr <sourceipaddr>`**

The IP address of the logical port on the subtending (source) chassis.

**`-dstipaddr <destipaddr>`**

The WAN IP address of the logical port on the subtended (destination) chassis.

**`-mask <subnetmask>`**

The subnet mask for the IP session.

**`-parentipaddr <paripaddr>`**

The IP address of the chassis to which the destination chassis is subtended.

**-parentslotport** <**pslot.pport**>

The channel card slot and port through which the destination chassis is subtended.

[**-admin**(**up**|**down**)]

Specifies the administrative status of the line. Type **`-admin up`** to activate the line. Type **`-admin down`** to deactivate it.

### Example

```
::subtend=> modify 5 0 100 -srcipaddr 192.169.2.2 -dstipaddr
192.169.2.1 -mask 255.255.255.0 -parentipaddr 192.169.2.2
-parentslotport 5.1 admin up
```

## Deleting a Subtended System

From the `::subtend=>` prompt, type the new command in the following format, then press **ENTER**.

**delete** <index>

### Parameters

<index>

The subtending table index number that is associated with the subtending configuration you want to delete. See “Displaying Subtending Information” on page 257 for information on the subtending table.

### Example

```
::subtend=> delete 5
```

# DISPLAYING SUBTENDING INFORMATION

From the `::subtend=>` prompt, type the new command in the following format, then press **ENTER**.

**show** [<slot>]

### Parameters

[<slot>]

The slot and port for which you are displaying subtending information. Omitting this parameter displays all subtending information.

### Example

::subtend=> **show 5**

The following screen illustrates an example of the show command.

```
::subtend=> show 5

Idx St Pt SVpi SVci DVpi DVci SIp         DIp         Smask
5   5  1  127  32   127  32   192.169.2.2 192.169.2.1 255.255.255.0
PSt PPt PIp         operS
5   1   192.169.2.2 up
```

The following table describes the information displayed after you type a show command.

| Column | Description |
|---|---|
| Idx | The index number that is associated with a specific subtending configuration. |
| St | The channel card slot through which subtending occurs. |
| Pt | The channel card port through which subtending occurs. |
| SVpi | The VPI at the source chassis. |
| SVci | The VCI at the source chassis. |
| DVpi | The VPI at the destination chassis. |
| DVci | The VCI at the destination chassis. |
| SIp | The IP address of the logical port on the subtending (source) chassis. |
| DIp | The WAN IP address of the logical port on the subtended (destination) chassis. |
| Smask | The subnet mask for the IP session. |
| PSt | The channel card slot number of the chassis through which the destination chassis is subtended. |
| PPt | The channel card port through which the destination chassis is subtended. |
| PIp | The IP address of the chassis to which the destination chassis is subtended. |
| operS | The status of the subtending configuration, **up** or **down**. |

# MONITORING SUBSCRIBER CONNECTIONS 12

This chapter describes how to monitor Avidia subscriber connections, including loop status, performance history and remote status for ADSL, IDSL and SDSL lines using the command-line interface.

# MONITORING ADSL PERFORMANCE

You can monitor ADSL loop status and performance history either by port or for all ADSL lines in the system at once. You access all ADSL statistics from the `::adsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::adsl=>` prompt.

**`display stats adsl`**

## Monitoring ADSL Loop Status

Type the loop command in the following format then press **ENTER**.

**`loop`** `[<port>]`

### Parameters

`<port>`

The port for which you want to view current status (format *slot.port*). Omitting this parameter displays the specified loop status for all ADSL ports.

### Example

`::adsl=>` **`loop 4.2`**

A screen similar to the following displays.

```
::adsl=>loop 4.2

                                       Upstream                Downstream
    Current Transmit Rate:                    0                         0
     Current Output Power:                    0                         0
      SNR Margin(1/10 dB):                 1280                      1280
Line Attenuation(1/10 dB):                    0                         0
     Interleave Delay(ms):                    0                         0
          Errored Seconds:                    0                         0
            Loss of Frame:                    0                         0
           Loss of Signal:                    1                         1
            Current State:    noPeerAtuPresent                   noDefect
```

The following table describes the information displayed after you type a loop command.

| Information | Description |
|---|---|
| Current Transmit Rate | The rate at which data is transmitting. |
| Current Output Power | The actual transmit power in dBm. |
| SNR Margin (1/10 dB) | The signal-to-noise ratio of the signal received by the ATU, in 1/10 dB. |
| Line Attentuation (1/10 dB) | The measured difference between the total power transmitted by the sending ATU and the total power received by the receiving ATU, in 1/10 dB. |
| Interleave Delay (ms) | The number of milliseconds delay that is occurring between interleaved data bits. |
| Errored Seconds | The number of seconds in a 15-minute data collection period during which errors occur that prevent the payload from being corrected. |
| Loss of Frame | The number of seconds in a 15-minute data collection period during which the frames on the ADSL interface lose sync. |
| Loss of Signal | The number of seconds in a 15-minute data collection period during which the signal falls below the configured target noise margin. |
| Current State | The current status of the ADSL loop. Options:<br>• noDefect—There are no errors on the line.<br>• lossOfFraming—The line is not receiving valid frames.<br>• lossOfSignal—The line is not receiving valid signal.<br>• lossOfPower—The line is not receiving power.<br>• lossOfSignalQuality—The margin has fallen below the configured target margin or the BER exceeds $10^{-7}$.<br>• dataInitFailure—The ATU was unable to initialize.<br>• configInitFailure—The ATU was unable to initialize because the ATU at the other end does not support the requested configuration.<br>• protocolInitFailure—The ATU was unable to initialize because of an incompatible protocol used by the peer at the other end.<br>• noPeerAtuPresent—The ATU was unable to initialize because no activation sequence was detected from the ATU at the other end. |

## Monitoring ADSL Performance History

You can monitor 15-minute, current-day and previous-day ADSL performance history.

From the `::adsl=>` prompt, type the perf command in the following format then press **ENTER**.

**perf** [<port>] [**-day** (**curr**|**prev**)]

### Parameter

[<port>]

The port for which you want to display performance history (format *slot.port*).

[**-day**(**curr**|**prev**)]

The time period for which you want to display performance history. Omitting this parameter displays performance data for the current 15-minute data reporting interval. Options:

**-day curr**—Displays performance history for the current day.

**-day prev**—Displays performance history for the previous day.

### Examples

```
::adsl=> perf 3.2 -day curr
::adsl=> perf 3.2 -day prev
::adsl=> perf 3.2
::adsl=> perf
::adsl=> perf -day curr
::adsl=> perf -day prev
```

The following two screens illustrate an example of several ADSL performance commands.

```
::adsl=>perf 3.2 -day curr
           Upstream                    Downstream
Port       LOFs    LOSs    ESs         LOFs    LOSs    ESs
3.2        0       0       0           0       0       0

::adsl=>perf 3.2 -day prev
           Upstream                    Downstream
Port       LOFs    LOSs    ESs         LOFs    LOSs    ESs
3.2        0       0       0           0       0       0

::adsl=>perf 3.2
           Upstream                    Downstream
Port       LOFs    LOSs    ESs         LOFs    LOSs    ESs
3.2        0       0       0           0       0       0
```

```
::adsl=>perf -day curr
           Upstream                    Downstream
Port       LOFs    LOSs    ESs         LOFs    LOSs    ESs
3.1        0       0       0           0       0       0
3.2        0       0       0           0       0       0
3.3        0       0       0           0       0       0


::adsl=>perf
           Upstream                    Downstream
Port       LOFs    LOSs    ESs         LOFs    LOSs    ESs
3.1        0       0       0           0       0       0
3.2        0       0       0           0       0       0
3.3        0       0       0           0       0       0
```

The following table describes the information displayed after you type a perf command.

| Information | Description |
|---|---|
| Port | The ADSL card slot and port to which the row of statistics applies. |
| LOFs (Upstream/Downstream) | Loss of frames. The number of seconds in the specified 15-minute data collection period during which the frames on the ADSL interface lose sync. |
| LOSs (Upstream/Downstream) | Loss of signal. The number of seconds in the specified 15-minute data collection period during which the signal falls below the configured target noise margin. |
| ESs (Upstream/Downstream) | Errored seconds. The number of seconds in the specified 15-minute data collection period during which errors occur that prevent the payload from being corrected. |

# MONITORING SDSL FRAME PERFORMANCE

You can monitor SDSL frame statistics and performance history either by port or for all SDSL frame lines in the system at once. You access all SDSL frame statistics from the `::frame=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frame=>` prompt.

**`display stats sdsl frame`**

## Displaying SDSL Frame Line Statistics

Type the line command in the following format then press **ENTER**.

**`loop`** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to view statistics (format *slot.port*). Omitting this parameter displays the specified loop status for all SDSL frame ports.

### Example

`::frame=> loop 4.2`

A screen similar to the following displays.

```
::frame=>loop 4.2

      TipRing               Network                Customer
Port  Reversal  Up_State   Mgn  MgnH  MgnL  Atn  Mgn  MgnH  MgnL  Atn
3.1     no      signaling  0    0     0     0    0    0     0     0
```

The following table describes the information displayed after you type a line command.

| Information | Description |
|---|---|
| Port | The slot and port for which the statics are displayed. |
| TipRing Reversal | The current Tip/Ring reversal status on the SDSL frame line. Options:<br>• yes—Tip and Ring are reversed.<br>• no—Tip and Ring are not reversed. |
| Up_State | The current state of the SDSL frame loop. If the port Admin Status is down, this value is undefined. Options:<br>• up—SDSL frame channel synchronization is complete.<br>• signaling—The channel is attempting SDSL frame synchronization.<br>• acquiring/converging—The channel is attempting SDSL frame synchronization. |
| Mgn (Network/Customer) | The signal-to-noise ratio of the received signal in 1/10 dB. |
| MgnH (Network/Customer) | The highest margin that occurred since the SDSL frame loop synchronized. |
| MgnL (Network/Customer) | The lowest margin that occurred since the SDSL frame loop synchronized. |
| Atn (Network/Customer) | The measured difference between the total signal power transmitted by the sending unit and the total signal power received by the receiving unit in 1/10 dB. |

## Displaying SDSL Frame Performance History

You can monitor SDSL frame 15-minute, 24-hour and 7-day performance history. Type the perf command in the following format then press **ENTER**.

**perf** [<port>] [**-id** (<number>|**all**) [-**week**]]

### Parameter

<port>

The port for which you want to view performance (format *slot.port*). Omitting this parameter displays the specified loop status for all SDSL frame ports.

[**-id** (<number>|**all**) [-**week**]]

(<number>|**all**)

If you do not include the **-week** parameter in the command line, <number> is the number of the 15-minute data collection interval for which the performance data is displayed (valid numbers are **1** to **96**). If you include the **-week** parameter in the command line, <number> is the number of the day for which the performance data is displayed (valid numbers are **1** to **7**). To display performance data for all intervals in the past 24 hours, type **-id all**.

[**-week**]

Typing this parameter displays seven-day performance history.

Omitting both the -id and -week parameters displays current 24-hour performance data.

### Example

::frame=> **perf 4.2 -id all -week**

A screen similar to the following displays.

```
::frame=>perf
                Network                         Customer
Port            ESs     UASs                    ESs     UASs

3.1             0       1374                    0       0
3.2             0       1374                    0       0
3.3             0       1374                    0       0
```

The following table describes the information displayed after you type a perf command.

| Information | Description |
|---|---|
| Port | The port for which the performance data is displayed. |
| ESs (Network/Customer) | The number of errored seconds that occurred during the specified interval. Errored seconds are seconds during which errors occur that prevent the payload from being corrected. |
| UASs (Network/Customer) | The number of unavailable seconds that occurred during the specified interval. Unavailable seconds are seconds during which the SDSL frame loop is not synchronized. |

# MONITORING SDSL FRAME CPE STATISTICS

You can monitor the transmitted and received octets for each modem that is attached to an SDSL frame port.

You view SDSL frame CPE statistics using the command-line interface from the `::interfaces=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::interfaces=>` prompt.

**`display stats interfaces`**

Type **`cpe`** then press **ENTER**.

A screen similar to the following displays.

```
::interfaces=> cpe

CPEPort   LAN inOctets     LAN outOctets     WAN inOctets     WAN outOctets
4.1            0                 0                0                  0
4.2            0                 0                292924             32364
```

The following table describes the information displayed after you type a cpe command.

| Information | Description |
|---|---|
| CPEPort | The port to which the CPE is attached. |
| LAN inOctets | The number of octets received on the CPE LAN interface. |
| LAN outOctets | The number of octets transmitted on the LAN interface. |
| WAN inOctets | The number of octets received on the CPE WAN interface. |
| WAN outOctets | The number of octets transmitted on the WAN interface. |

# MONITORING SDSL CELL PERFORMANCE

You can monitor SDSL cell statistics and performance history either by port or for all SDSL cell lines in the system at once. You access all SDSL cell statistics from the `::cell=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::cell=>` prompt.

**`display stats sdsl cell`**

## Displaying SDSL Cell Line Statistics

Type the line command in the following format then press **ENTER**.

**`line`** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to view statistics (format *slot.port*). Omitting this parameter displays the specified loop status for all SDSL cell ports.

### Examples

`::cell=> **line 18.1**`

`::cell=> **line**`

A screen similar to the following displays.

```
::cell=>line 18.1


Port  SDSL_State  SNR   Atn
18.1     down(2)    0     0

:cell=>line


Port  SDSL_State  SNR   Atn
18.1     down(2)    0     0
18.2     down(2)    0     0
18.3     down(2)    0     0
18.4     down(2)    0     0
```

The following table describes the information displayed by a line command.

| Information | Description |
|---|---|
| Port | The slot and port for which the statics are displayed. |
| SDSL_State | The current status of the SDSL cell loop. Options:<br>• **Up**—The line is up.<br>• **Down**—The line is down.<br>• **Hand**—The line is trying to connect.<br>• **Test**—The line is in test mode.<br>• **Fail**—The line has failed. |
| SNR | The signal-to-noise ratio margin of the signal received in dB. |
| Atn | The measured difference between the total signal power transmitted by the sending unit and the total signal power received by the receiving unit in dB. |

## Displaying SDSL Cell Performance History

You can monitor SDSL cell 15-minute, 24-hour and 7-day performance history. Type the perf command in the following format then press **ENTER**.

**perf** [<port>] [**-id** (<number>|**all**) [-**week**]]

### Parameter

<port>

The port for which you want to view performance (format *slot.port*). Omitting this parameter displays the specified loop status for all SDSL cell ports.

[**-id** (<number>|**all**) [-**week**]]

(<number>|**all**)

If you do not include the **-week** parameter, <number> is the number of the 15-minute data collection interval for which the performance data is displayed (valid numbers are **1** to **96**). If you include the **-week** parameter, <number> is the number of the day for which the performance data is displayed (valid numbers are **1** to **7**). To display performance data for all intervals in the past 24 hours, type **-id all**.

[**-week**]

Typing this parameter displays seven-day performance history. Omitting both the -id and -week parameters displays current 24-hour performance data.

### Example

::cell=> **perf 18.1 -id all -week**

A screen similar to the following displays.

```
::cell=>perf 18.1 -id all -week

Port      LOSS     LOCD     SLOCD      History_Id

18.1         0        0         0               1
18.1         0        0         0               2
18.1         0        0         0               3
18.1         0        0         0               4
18.1         0        0         0               5
18.1         0        0         0               6
18.1         0        0         0               7
```

The following table describes the information displayed after you type a perf command.

| Information | Description |
|---|---|
| Port | The port for which the performance data is displayed. |
| LOSS | Loss of signal seconds are seconds during which the SDSL cell line is incapable of transmitting or receiving data and all data is lost. |
| LOCD | Loss of cell delineation seconds are seconds in which some cells transmitted during that second were lost. |
| SLOCD | Severe loss of cell delineation seconds are seconds in which most of the cells transmitted during that second are lost. |
| History_Id | If you do not include the **`-week`** parameter in the command line, `<number>` is the number of the 15-minute data collection interval for which the performance data is displayed (valid numbers are **1** to **96**). If you include the **`-week`** parameter in the command line, `<number>` is the number of the day for which the performance data is displayed (valid numbers are **1** to **7**). To display performance data for all intervals in the past 24 hours, type **`-id all`**. |

## Displaying SDSL Cell TC Layer Statistics

You can display ATM transmission convergence (TC) layer statistics for cell-based SDSL circuits. Type the tclayer command in the following format and press **ENTER**.

**`tclayer`** `[slot.port]`

### Parameter

`[slot.port]`

The slot and port for which you want to display statistics (format *slot.port*). Omitting this parameter displays statistics for all SDSL cell ports.

### Example

::cell=> **tclayer 3.1**

A screen similar to the following displays.

```
localhost::cell=> tclayer 3.1
*****  SDSL Cell TC Layer Statistics for Port 3.1  *****
Transmitted Cells:  0
Received    Cells:  0
Mismatched  Cells:  0
LOCD Event  Count:  1
TC Layer     Mode:  normal(1)
Time Last Cleared:  Mon, Nov 13 2000 09:57:43
```

The following table describes the information displayed after you type a tclayer command.

| Information | Description |
|---|---|
| Transmitted Cells | The number of cells transmitted from the port to the modem since the counters were last cleared. |
| Received Cells | The number of cells received by the port from the modem since the counters were last cleared. |
| Mismatched Cells | This information is for internal ADC use only. |
| LOCD Event Count | Loss of cell delineation seconds are seconds in which some cells transmitted during that second were lost. |
| TC Layer Mode | The current ATM mode, either normal or loopback. |
| Time Last Cleared | The time the SDSL cell statistics counters were last reset to zero. See “Clearing SDSL Cell Statistics.” |

## Clearing SDSL Cell Statistics

You can reset the SDSL cell statistical counters to zero. Type the clearstats command in the following format then press **ENTER**.

**`clearstats`** `[slot.port] [`**`-y`**`]`

### Parameter

`[slot.port]`

The slot and port for which you want to clear statistics (format *slot.port*). Omitting this parameter clears statistics for all SDSL cell ports.

`[`**`-y`**`]`

Resets the SDSL cell statistical counters to zero without confirming your actions.

### Example

`::cell=>` **`clearstats 18.3`**

A screen similar to the following displays.

```
::cell=>clearstats 18.3

Are you sure? (y/n):
```

Type **Y** to clear statistics for the port or **N** to cancel this operation.

# MONITORING IDSL CURRENT PERFORMANCE

Current performance statistics display a summary of the performance data for a specified IDSL line and port.

## Monitoring IDSL Current Performance

You access IDSL current performance statistics from the `::idsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::idsl=>` prompt.

**`disp stats idsl`**

From the `::idsl=>` prompt, type the following command then press **ENTER** to display the current hourly and daily port statistics. The performance monitoring mode setting determines how statistics are collected (see "Configuring IDSL Line Profiles" on page 127 for details).

**`perf`** `[<port>] [-interval (<number>|`**`all`**`) [-day]]`

### Parameters

`[<port>]`

The port for which you want to display the current performance statistics (format *slot.port*). Omitting this parameter displays the current performance statistics for all configured IDSL channels.

`[`**`-interval`** `(<number>|`**`all`**`) [`**`-day`**`]]`

**`-interval`** `(<number>|`**`all`**`)`

The 15-minute interval for which you want to display current performance statistics. Type **`all`** to display interval statistics for the most recent 24 hours.

**`-day`**

Displays current performance statistics since this day began. Omitting this parameter displays statistics since this hour began.

### Examples

`::idsl=>` **`perf 5.1`**

`::idsl=>` **`perf 5.1 -interval all -day`**

A screen similar to the following displays.

```
::idsl=> perf 4.1

      Node     Network                          Customer
 Port Id       BEs       ESs      SESs       BEs       ESs       SESs      Mode
  4.1  0         1         1         0         0         0          0   path(1)
  4.1  1         0         0         0         0         0          0   path(1)
  4.1  2         0         0         0         0         0          0   path(1)
  4.1  3         0         0         0         0         0          0   path(1)
  4.1  4         0         0         0         0         0          0   path(1)
  4.1  5         0         0         0         0         0          0   path(1)
  4.1  6         0         0         0         0         0          0   path(1)
```

The following table describes the information displayed after you type a perf command. **Network** indicates statistics for the upstream direction, toward the network. **Customer** indicates statistics for the downstream direction, toward the customer.

| Information | Description |
|---|---|
| Port | The slot number and port number for which current performance is displayed. |
| Node ID | The node for which current performance is displayed. |
| BEs (Network/Customer) | The number of block errors since this interval (hour or day) began. |
| ESs (Network/Customer) | The number of errored seconds since this interval (hour or day) began. |
| SESs (Network/Customer) | The number of severely errored seconds since this interval (hour or day) began. |
| Mode | The performance monitoring mode (path or segmented). |

# MONITORING NETWORK CONNECTIONS 13

This chapter describes how to monitor Avidia network connections, including loop status, performance history, and remote status for SONET, DS1/T1, and DS3 lines using the command-line interface. It also describes how to monitor ATM statistics.

# MONITORING SONET PERFORMANCE

You can monitor SONET performance by Medium, Section, Line and Path layers.

You access all SONET statistics from the `::sonet=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::sonet=>` prompt.

**`display stats sonet`**

## Monitoring SONET Medium Statistics

From the `::sonet=>` prompt, type the medium command in the following format then press **ENTER**.

**`medium`** `[<port>]`

### Parameter

`[<port>]`

Specifies a particular port for which to display statistics (format *slot.port*). Each OC3 line card has two SONET fiber ports, which are identified by 1a and 1b. Only one port is active and passing data at a time. The second port is used for automatic protection switching to protect against a fiber or transceiver failure. Omitting this parameter displays statistics for all SONET ports.

### Examples

`::sonet=>` **`medium 12.1b`**

`::sonet=>` **`medium`**

The following screen illustrates an example of both medium commands.

```
::sonet=> medium

Port     Type    Time_Elapsed  Intervals    Coding    Line_Type

12.1a    SDH      244           96           NRZ       Multi Mode
12.1b    SDH      244           96           NRZ       Multi Mode


::sonet=> medium 12.1b

Port     Type    Time_Elapsed  Intervals    Coding    Line_Type

12.1b    SDH      244           96           NRZ       Multi Mode
```

The following table describes the information displayed after you type a medium command.

| Information | Description |
|---|---|
| Port | The OC3 line card slot and port to which the row of statistics applies. |
| Type | The interface type (SONET or SDH). |
| Time_Elapsed | The number of seconds that have elapsed since the beginning of the current 15-minute data collection period. |
| Intervals | The number of 15-minute performance data monitoring intervals supported by the system. The Avidia system has 96 intervals (equating to 24 hours). |
| Coding | The type of coding on the SONET interface. The Avidia system has NRZ (Non Return to Zero) SONET line coding. Therefore, the value for this parameter always displays NRZ. |
| Line_Type | The type of SONET line.<br>• Short Single Mode<br>• Multi Mode |

## Monitoring SONET Section Statistics

From the `::sonet=>` prompt, type the section command in the following format then press **ENTER**.

**`section`** `[<port>] [`**`-interval`**` (<number>|`**`all`**`)]`

### Parameter

`[<port>]`

Specifies a particular port for which to display statistics (format *slot.port*). Each OC3 line card has two SONET fiber ports, which are identified by 1a and 1b. Omitting this parameter displays statistics for all SONET ports.

`[`**`-interval`**` (<number>|`**`all`**`)`

Specifies the 15-minute reporting interval for which the statistics are displayed. Typing **`-interval all`** displays the entire 24-hour history. Omitting this parameter displays the current status.

<number>

Type a number from **1** to **96**, where **1** represents the most recent 15-minute reporting interval and **5** represents the fifth most recent 15-minute reporting interval.

### Examples

`::sonet=>` **`section 12.1a -interval 5`**

`::sonet=>` **`section`**

The following screen illustrates both section commands.

```
::sonet=> section 12.1a -interval 5

Port    ESs     SESs    SEFSs    CVs    Interval

12.1a    0       0       0        0        5


::sonet=> section
Port    Status   ESs     SESs    SEFSs    CVs
12.1a    LOF     0       0       0        0
12.1b    LOF     0       0       0        0
```

The following table describes the information displayed after you type a section command.

| Information | Description |
|---|---|
| Port | The OC3 line card slot and port to which the row of statistics applies. |
| Status | The current status of the specified port. Options:<br>• NoDefect—There are no errors on the SONET Section layer.<br>• LOS—There is a Loss Of Signal on the SONET Section layer.<br>• LOF—There is a Loss Of Frame on the SONET Section layer. |
| ESs | The number of errored seconds in the 15-minute reporting interval. Errored seconds are seconds during which at least one Section layer bipolar error was detected or a severely errored frame or loss of signal error was present. |
| SESs | The number of severely errored seconds in the 15-minute reporting interval. Severely errored seconds are seconds during which 2,500 or more Section layer bipolar errors were detected or a severely errored frame or loss of signal error was present. |
| SEFSs | The number of severely errored framing seconds in the 15-minute reporting interval. Severely errored framing seconds are seconds during which the incoming signal has a minimum of four consecutive errored framing patterns. |
| CVs | The number of coding violations in the 15-minute reporting interval. Coding violations are the number of bipolar errors detected at the Section layer. |
| Interval | The 15-minute reporting interval for which the statistics are reported. This column only displays if you specify an interval in the command line. |

## Monitoring SONET Line Statistics

From the `::sonet=>` prompt, type the line command in the following format then press **ENTER**.

**`line`** `[<port>]` `[`**`-far`**`]` `[`**`-interval`**` (<number>|`**`all`**`)]`

### Parameters

`[<port>]`

Specifies a particular port for which to display statistics (format *slot.port*). Each OC3 line card has two SONET fiber ports, which are identified by 1a and 1b. Omitting this parameter displays statistics for all SONET ports.

`[`**`-far`**`]`

Displays statistics for the remote device. Omitting this parameter displays statistics for the local device.

`[`**`-interval`**` (<number>|`**`all`**`)]`

Specifies the 15-minute reporting interval for which the statistics are displayed. **`All`** displays the entire 24-hour history. Omitting this parameter displays the current status.

<number>

Type a number from **1** to **96**, where **1** represents the most recent 15-minute reporting interval and **5** represents the fifth most recent 15-minute reporting interval.

### Examples

`::sonet=>` **`line 12.1a -far -interval 5`**

`::sonet=>` **`line 12.1a -interval 5`**

`::sonet=>` **`line`**

The following screen illustrates all three line commands.

```
::sonet=> line 12.1a -far -interval 5
Port    ESSs    SESs    CVs      UASs  Interval
12.1a    0       0       0        0        5

::sonet=> line 12.1a -interval 5
Port    ESSs    SESs    CVs      UASs  Interval
12.1a    0       0       0        0        5

::sonet=> line
Port    Status   ESSs    SESs    CVs      UASs
12.1a    AIS      0       0       0        0
12.1b    AIS      0       0       0        0
```

The following table describes the information displayed after you type a line command.

| Information | Description |
|---|---|
| Port | The OC3 card slot and port to which the row of statistics applies. |
| Status | Options:<br>• NoDefect—There are no errors on the SONET line.<br>• AIS (Alarm Indication Signal)—There is an alarm at the local end of the SONET line.<br>• RDI (Remote Defect Indication)—There is an alarm at the remote end of the SONET line. |
| ESSs | The number of errored seconds in the reporting interval. Errored seconds are the number of seconds during which at least one Line layer bipolar error was detected or an Alarm Indication Signal - Line (AIS-L) error was present. |
| SESs | The number of severely errored seconds in the reporting interval. The number of seconds during which 2,500 or more Line layer bipolar errors were detected or an AIS-L error was present. |
| CVs | The number of coding violations in the reporting interval. Coding violations are the number of bipolar errors detected at the Line layer. |
| UASs | The number of unavailable seconds in the reporting interval. Unavailable seconds are the number of seconds during which the line was unavailable. A line becomes unavailable at ten consecutive severely errored seconds. |
| Interval | A number between 1 and 96 which identifies the interval for which the set of statistics is displayed. For example, interval 1 provides statistics for the most recently completed 15-minute interval and interval 5 provides the statistics for the fifth most recently completed 15-minute interval. This information only displays if you specify an interval in the command line. |

## Monitoring SONET Path Statistics

From the `::sonet=>` prompt, type the path command in the following format then press **ENTER**.

**`path`** `[<port>]` **`[-far]`** `[`**`-interval`** `(<number>`**`|all`**`)]`

### Parameters

[<port>]

Specifies a particular port for which to display statistics (format *slot.port*). Each OC3 line card has two SONET fiber ports, which are identified by 1a and 1b. Omitting this parameter displays statistics for all SONET ports.

[**-far**]

Displays statistics for the remote device. Omitting this parameter displays statistics for the local device.

[**-interval** (<number>|**all**)]

Specifies the 15-minute reporting interval for which the statistics are displayed. **All** displays the entire 24-hour history. Omitting this parameter displays the current status.

<number>

Type a number from **1** to **96**, where **1** represents the most recent 15-minute reporting interval and **5** represents the fifth most recent 15-minute reporting interval.

### Examples

::sonet=> **path 12.1a -far -interval 5**

::sonet=> **path 12.1a -interval 5**

The following screen illustrates an example of each path command.

```
::sonet=> path 12.1a -far -interval 5
Port             ESSs    SESs    CVs     UASs   Interval
12.1a            0       0       0        0     5

::sonet=> path 12.1a -interval 5
Port             ESSs    SESs    CVs     UASs   Interval
12.1a            0       0       0        0     5

::sonet=> path
Port    Status  Width         ESSs    SESs    CVs     UASs
12.1a     RDI    sts3c/stm1     0       0       0        0
12.1b     AIS    sts3c/stm1     0       0       0        0
```

The following table describes the information displayed after you type a path command.

| Information | Description |
|---|---|
| Port | The port to which the row of statistics applies. |
| Status | The current status of the interface. This information only displays when you type the path command without any additional parameters. Options:<br>• NoDefect—There are no errors on the Path layer.<br>• RDI —There is an alarm at the remote end of the SONET line.<br>• AIS —There is an alarm at the local end of the SONET line.<br>• LOP—There is a Loss of Pointer error on the interface.<br>• UE (unequipped)—The Path layer is not configured properly at the remote end.<br>• SLM (signal label mismatch)—The Path layer is not properly provisioned. |
| Width | The designated optical bandwidth. This information only displays when you type the path command without any additional parameters. |
| ESSs | The number of errored seconds in the 15-minute reporting interval. Errored seconds are the number of seconds during which at least one Path layer bipolar error was detected or an Alarm Indication Signal - Path (AIS-P) error was present. |
| SESs | The number of severely errored seconds in the 15-minute reporting interval. Severely errored seconds are the number of seconds during which 2,400 or more Path layer bipolar errors were detected or an AIS-P or Loss of Pointer - Path (LOP-P) error was present. |
| CVs | The number of coding violations in the 15-minute reporting interval. Coding violations are the number of bipolar errors detected at the Path layer. |
| UASs | The number of unavailable seconds in the 15-minute reporting interval. A path becomes available after ten consecutive severely errored seconds. |
| Interval | A number between 1 and 96 which identifies the interval for which the set of statistics is displayed. For example, interval 1 provides statistics for the most recently completed 15-minute interval and interval 5 provides the statistics for the fifth most recently completed 15-minute interval. This information only displays if you specify an interval in the command line. |

# MONITORING DS1/T1 PERFORMANCE

You can monitor DS1/T1 current performance and performance history, by port or for all ports at once. You monitor DS1 performance from the `::stats=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::stats=>` prompt.

**`display stats`**

Type the ds1 command in the following format, then press **ENTER**.

**`ds1`** `[<port> [`**`-interval`**` (number>|`**`all`**`>]]`

### Parameter

`[<port>]`

The port for which you want to view performance (format *slot.port*).

`[`**`-interval`**` (<number>|`**`all`**`)]`

`(<number>|`**`all`**`)`

The number of the 15-minute data collection interval for which the performance data is displayed. Type **`-interval all`** to display performance data for all intervals in the past 24 hours. Omitting this parameter displays the current and 24-hour DS1 performance data for the specified port. You cannot specify this parameter unless you specified a value for the `<port>` parameter.

Omitting both the port and -interval commands displays current and 24-hour DS1 performance data for all ports.

### Examples

`::stats=>` **`ds1 3.1 -interval all`**

`::stats=>` **`ds1 3.1 -interval 3`**

`::stats=>` **`ds1 3.1`**

`::stats=>` **`ds1`**

A screen similar to the following displays.

```
::stats=>ds1 4.2

               THE DS1 CURRENT/TOTAL TABLE FOR PORT 4.2

                                       Current                Total
                 Errored Seconds:      48                     226
        Severely Errored Seconds:      0                      0
Severely Errored Framing Seconds:      0                      0
             Unavailable Seconds:      0                      966
         Controlled Slip Seconds:      0                      0
          Path Coding Violations:      50                     231
            Line Errored Seconds:      48                     226
          Bursty Errored Seconds:      2                      5
                Degraded Minutes:      0                      0
            Line Code Violations:      0                      10
```

The following table describes the information displayed after you type the ds1 command.

| Information | Description |
|---|---|
| Port | The port number for which the statistics are displayed. |
| Errored Seconds | Errored seconds are seconds during which any of the following occur:<br>• one or more AIS defects<br>• one or more controlled slips<br>• one or more Path code violations<br>• one or more out-of-frame defects<br>• one or more bipolar errors (D4 mode only) |
| Severely Errored Seconds | For ESF mode, severely errored seconds are seconds in which 320 or more Path code violation errors, one or more out-of-frame defects or an AIS defect occur.<br>For D4 mode, severely errored seconds are seconds in which framing errors, out of frame defects, or 1,544 or more line coding violations occur. |
| Severely Errored Framing Seconds | Severely errored framing seconds are seconds during which one or more out-of-frame defects or an AIS defect occurs. |
| Unavailable Seconds | The number of seconds during which the interface was unavailable. A line becomes unavailable at ten consecutive severely errored seconds. |
| Controlled Slip Seconds | A second during which one or more controlled slips occur. A controlled slip is the replication or deletion of the payload bits in a DS1 frame. |
| Path Coding Violations | Frame synchronization bit errors. |
| Line Errored Seconds | A second during which one or more line code violations occur. |
| Bursty Errored Seconds | A second during which between 1 and 320 path coding violations occurs and no severely errored frame defects or AIS defects occur. This applies to ESF mode only. |
| Degraded Minutes | This parameter is not currently supported, therefore a zero displays. |
| Line Code Violations | Bipolar violations or excessive zeroes. |

# MONITORING DS3 PERFORMANCE

You can monitor DS3 current performance and performance history, by port or for all ports at once. You monitor DS3 performance from the ::stats=> prompt. From the ::root=> prompt, type the following command then press **ENTER** to display the ::stats=> prompt.

**display stats**

Type the ds3 command in the following format, then press **ENTER**.

**ds3** [<port> [**-interval** (number>|**all**>)]]

### Parameter

[<port>]

The port for which you want to view performance (format *slot.port*).

[**-interval** (<number>|**all**)]

(<number>|**all**)

The number of the 15-minute data collection interval for which the performance data is displayed. Type **-interval all** to display performance data for all intervals in the past 24 hours. Omitting this parameter displays the current and 24-hour DS3 performance data for the specified port. You cannot specify this parameter unless you specified a value for the <port> parameter.

Omitting both the port and -interval commands displays current and 24-hour DS3 performance data for all ports.

### Examples

::stats=> **ds3 3.1 -interval all**

::stats=> **ds3 3.1 -interval 3**

::stats=> **ds3 3.1**

::stats=> **ds3**

A screen similar to the following displays.

```
::stats=>ds3 4.2

                 THE DS3 CURRENT/TOTAL TABLE FOR PORT 12.2

                                       Current                Total
           P-bit Errored Seconds:      48                     226
  P-bit Severely Errored Seconds:      0                      0
Severely Errored Framing Seconds:      0                      0
             Unavailable Seconds:      0                      966
          Line Coding Violations:      0                      0
         P-bit Coding Violations:      50                     231
            Line Errored Seconds:      48                     226
         C-bit Coding Violations:      2                      5
           C-bit Errored Seconds:      0                      0
  C-bit Severely Errored Seconds:      0                      10
```

The following table describes the information displayed after you type the ds3 command.

| Information | Description |
|---|---|
| Slot<br>Card Description<br>Port | The slot number, description of the card and port number for which the performance statistics are displayed. |
| P-bit Errored Seconds | P-bit errored seconds are seconds during which any of the following occur:<br>• an incoming AIS is detected<br>• one or more Path code violations<br>• one or more out-of-frame defects |
| P-bit Severely Errored Seconds | P-bit severely errored seconds are seconds during which any of the following occur:<br>• an incoming AIS is detected<br>• 44 or more Path code violations<br>• one or more out-of-frame defects |
| Severely Errored Framing Seconds | Severely errored framing seconds are seconds during which one or more out-of-frame errors or an incoming AIS is detected. |
| Unavailable Seconds | Unavailable seconds are seconds during which the interface was unavailable. A line becomes unavailable at ten consecutive P-bit severely errored seconds. |
| Line Coding Violations | Line coding violations are bipolar violations or excessive zeroes in the line coding. |
| P-bit Coding Violations | P-bit coding violations occur when a received P-bit code on the DS3 M-frame is not identical to the corresponding locally-calculated code. |
| Line Errored Seconds | Line errored seconds are seconds during which one or more line code violations occur. |
| C-bit Coding Violations | C-bit coding violations are C-bit parity errors. |
| C-bit Errored Seconds | C-bit errored seconds are seconds during which any of the following occur:<br>• one or more C-bit coding violations<br>• one or more out-of-frame defects<br>• an incoming AIS is detected |
| C-bit Severely Errored Seconds | C-bit severely errored seconds are seconds during which any of the following occur:<br>• 44 or more C-bit coding violations<br>• one or more out-of-frame defects<br>• an incoming AIS is detected |

# MONITORING ATM CONNECTION STATISTICS

You can monitor ATM connection statistics by PVCC or PVPC.

## ATM PVCC Connection Statistics

You can monitor the number of cells transmitted and received, the number of nonconforming cells, and the number of discarded cells for each active PVCC. Two entries display for each configured PVCC—each end of the connection is a separate table entry.

You monitor ATM PVCC connection statistics using the command-line interface from the `::vcl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::vcl=>` prompt.

**`display stats vcl`**

### Monitoring ATM PVCC Connection Statistics

From the `::vcl=>` prompt, type **`show`** then press **ENTER**

A screen similar to the following displays.

```
::vcl=> show

                                 In        Out       Non            Discard
Index    Port    VPI    VCI      Cells     Cells     Conforming     Cells

    1    1.1     0      1024     0x00      0x00      0x00           0x00
    2    2.1     0       115     0x00      0x00      0x00           0x00
```

| Information | Description |
|---|---|
| Index | The PVCC Connection Statistics Table row index number. |
| Port | The slot and port on which the PVCC is configured. |
| VPI<br>VCI | The PVCC VPI and VCI. |
| In Cells | The number of cells received, represented in hexidecimal format. |
| Out Cells | The number of cells transmitted, represented in hexidecimal format. |
| Non Conforming | The number of received cells that do not conform to the configured traffic contract, represented in hexidecimal format. This statistic is captured whether policing is enabled or not. |
| Discard Cells | The number of received cells that were discarded as they did not conform to the configured traffic contract, represented in hexadecimal format. This statistic is captured only if policing is enabled for this PVCC. |

## ATM PVPC Connection Statistics

You can monitor the number of cells transmitted and received, the number of nonconforming cells, and the number of discarded cells for each active PVPC. Two entries display for each configured PVPC—each end of the connection is a separate table entry.

### Monitoring ATM PVPC Connection Statistics

You monitor ATM PVPC connection statistics using the command-line interface from the `::vpl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::vpl=>` prompt.

**`display stats vpl`**

From the `::vpl=>` prompt, type **`show`** then press **ENTER**

A screen similar to the following displays.

```
::vpl=> show

                          In       Out      Non            Discard
Index    Port    VPI      Cells    Cells    Conforming     Cells

    1    1.1     0        0x00     0x00     0x00           0x00
    2    2.1     0        0x00     0x00     0x00           0x00
```

| Information | Description |
|---|---|
| Index | The PVPC Connection Statistics Table row index number. |
| Port | The slot and port on which the PVPC is configured. |
| Vpi | The VPI of the PVPC connection. |
| In Cells | The number of cells received, represented in hexidecimal format. |
| Out Cells | The number of cells transmitted, represented in hexidecimal format. |
| Non Conforming | The number of received cells that do not conform to the configured traffic contract, represented in hexidecimal format. This statistic is captured whether policing is enabled or not. |
| Discard Cells | The number of received cells that were discarded as they did not conform to the configured traffic contract, represented in hexadecimal format. This statistic is captured only if policing is enabled for this PVPC. |

# MONITORING APS STATUS

You can monitor APS information such as the date and time of APS events and the currently active channel.

You monitor APS status using the command-line interface from the `::stats=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::stats=>` prompt.

**`display stats`**

Type **`aps`** then press **ENTER**.

A screen similar to the following displays.

```
::stats=> aps

Slot  Active        Last_Work_Switch      Cnt         Last_Prot_Switch      Cnt
    2  Work         Dec 22 1999 07:15:09   0          Dec 22 1999 07:15:09   0
```

| Information | Description |
|---|---|
| Slot | The slot for which the APS status is displayed. |
| Active | Indicates which channel (working or protection) is currently carrying the traffic. |
| Last_Work_Switch | The date and time of the last switch to the working channel. |
| Cnt | The number of times the traffic has switched to the working channel. |
| Last_Prot_Switch | The date and time of the last switch to the protection channel. |
| Cnt | The number of times the traffic has switched to the protection channel. |

# MONITORING FRAME RELAY PERFORMANCE STATISTICS

You monitor frame relay connection statistics using the command-line interface. You access frame relay statistics from the `::frame-relay=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frame-relay=>` prompt.

**`disp stats frame-relay`**

## Monitoring Link Statistics

You access frame relay link statistics from the `::link=>` prompt. From the `::frame-relay=>` prompt, type **`link`** then press **ENTER** to display the `::link=>` prompt.

From the `::link=>` prompt, type the following command then press **ENTER** to display the link statistics.

**`show`** `<fslot.port>`

### Parameters

`<fslot.port>`

The frame card slot and port.

### Example

`::link=>` **`show 5.1`**

A screen similar to the following displays.

```
::link=> show 5.1

Link statistics for Frame Relay port 5.1:
Total number of frames transmitted              538875
Total number of frames received                 565157
Total number of characters transmitted          33348121
Total number of characters received             34494696
Total number of frames received with FECN       0
Total number of frames received with BECN       0
Total number of invalid frames received         71
Total number of short(< 5 octets) frames rcvd   0
Total number of long(> 8193 octets) frames rcvd 0
Total number of frames received with invalid DLCI 0
Total number of frames received with unknown DLCI 71
Total number of frames rcvd with unknown error  0
Total number of received frames aborted         0
Total number of sent frames aborted             0
Type of error last seen on this interface       unknownAddress(5)
Number of times link went down since initialized 0
```

The following information displays:

- The frame card slot number and port number in the format *slot.port* (for example, port 5.1).
- The total number of frames transmitted.
- The total number of frames received.
- The total number of characters transmitted.
- The total number of characters received.
- The total number of frames received with FECN.
- The total number of frames received with BECN.
- The total number of invalid frames received.
- The total number of short (less than 5 octets) frames received.
- The total number of long (more than 8193 octets) frames received.
- The total number of frames received with invalid an DLCI.
- The total number of frames received with unknown DLCI.
- The total number of frames received with unknown error.
- The total number of received frames aborted.

- The total number of sent frames aborted.
- The type of error last seen on this interface.
- The number of times the link went down since it was initialized.

## Monitoring LMI Statistics

You access frame relay Link Management Interface (LMI) statistics from the `::lmi=>` prompt. From the `::frame-relay=>` prompt, type **`lmi`** then press **ENTER** to display the `::lmi=>` prompt.

From the `::lmi=>` prompt, type the following command then press **ENTER** to display the LMI statistics.

**show** <fslot.port>

### Parameters

<fslot.port>

The frame card slot and port.

### Example

::lmi=> **show 5.1**

A screen similar to the following displays.

```
::lmi=> show 5.1

Link statistics for Frame Relay port 5.1:
Number of LMI status enquiries received          25288
Number of LMI full status enquiries received     4216
Number of LMI status responses sent              4216
Number of LMI full status responses sent         0
Number of LMI updates received                   0
Number of LMI updates sent                       0
Number of unknown LMI messages received          0
Number of lost LMI sequences                     0
Number of missing LMI responses                  0
Receive sequence number of last LMI frame rcvd   0
Receive sequence number of last LMI frame sent   213
Send sequence number of last LMI frame rcvd      213
Send sequence number of last LMI frame sent      0
Number of LMI Messages without Report type rcvd  0
Number of LMI Message without keepalive info rcvd 0
Number of LMI Messages with unsupported IE rcvd  0
Number of missing LMI status enquiries           0
```

The following information displays:

- The frame card slot number and port number in the format *slot.port* (for example, port 5.1).
- The number of LMI status enquiries received.
- The number of LMI full status enquiries received.
- The number of LMI status responses sent.
- The number of LMI full status responses sent.
- The number of LMI updates received.
- The number of LMI updates sent.
- The number of unknown LMI messages received.
- The number of lost LMI sequences.
- The number of missing LMI responses.
- The receive sequence number of last LMI frame received.
- The receive sequence number of last LMI frame sent.
- The send sequence number of last LMI frame received.
- The send sequence number of last LMI frame sent.
- The number of LMI Messages without Report type received.
- The number of LMI Message without keepalive information received.
- The number of LMI messages with unsupported IE (Information Element) received.
- The number of missing LMI status enquiries.

## Monitoring Circuit Statistics

You access frame relay circuit statistics from the `::dlci=>` prompt. From the `::frame-relay=>` prompt, type **`dlci`** then press **ENTER** to display the `::dlci=>` prompt.

From the `::dlci=>` prompt, type the following command then press **ENTER** to display the circuit statistics.

```
show <fslot.port> [<dlci>]
```

### Parameters

`<fslot.port>`

The frame card slot and port.

`[<dlci>]`

The DLCI (Data Link Connection Identifier) for this virtual circuit. If omitted, statistics display for all DLCIs.

### Examples

`::dlci=>` **`show 5.1 16`**

`::dlci=>` **`show 5.1`**

A screen similar to the following displays.

```
::dlci=> show 5.1

Dlci statistics for Frame Relay port 5.1 dlci 16:
Number of frames transmitted                      514796
Number of frames received                         515844
Number of characters transmitted                  33048548
Number of characters received                     33865244
Number of frames received with FECNs              0
Number of frames received with BECNs              0
Number of frames dropped on this circuit          0
Number of frames received with DE bit set         0
Number of frames sent with DE bit set             514796
Num of frames received on the circuit within Bc   0
Num of octets received on the circuit within Bc   0
Num of frames received on the circuit within Be   0
Num of octets received on the circuit within Be   0
Num of frames dropped in excess of Bc or Bc+Be    0
Num of octets dropped in excess of Bc or Bc+Be    0
Num of frames received in excess of Bc and Be     0
Num of octets received in excess of Bc and Be     0
Num of frames with DE bit set that is dropped     0
Num of octets with DE bit set that is dropped     0
Num of frames sent within the CIR                 0
Num of frames sent above CIR but within the EIR   514796
Up time since the circuit is created              0
Elapsed time when the circuit last change state   1588100
```

The following information displays:

- The frame card slot number and port number in the format *slot.port* (for example, port 5.1).
- The DLCI (Data Link Connection Identifier) for this virtual circuit.
- The number of frames transmitted.
- The number of frames received.
- The number of characters transmitted.
- The number of characters received.
- The number of frames received with FECNs.
- The number of frames received with BECNs.
- The number of frames dropped on this circuit.
- The number of frames received with the DE bit set.
- The number of frames sent with the DE bit set.
- The number of frames received on the circuit within the Bc (Committed Burst) value. Committed burst is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval.
- The number of octets received on the circuit within the Bc.
- The number of frames received on the circuit within the Be (Excess Burst) value. The excess burst value is the maximum number of uncommitted data bits that the network will attempt to deliver.
- The number of octets received on the circuit within the Be.
- The number of frames dropped in excess of the Bc or Bc+Be.
- The number of octets dropped in excess of the Bc or Bc+Be.
- The number of frames received in excess of the Bc and Be.
- The number of octets received in excess of the Bc and Be.
- The number of frames with the DE bit set that is dropped.
- The number of octets with the DE bit set that is dropped.
- The number of frames sent within the CIR (Committed Information Rate). The circuit throughput is the committed information rate value in seconds.
- The number of frames sent above CIR but within the EIR (Excess Information Rate).
- Up time since the circuit was created.
- Elapsed time when the circuit last changed state.

## Monitoring FRF.5 Statistics

You access frame relay FRF.5 statistics from the `::frf5=>` prompt. From the `::frame-relay=>` prompt, type **`frf5`** then press **ENTER** to display the `::frf5=>` prompt.

From the `::frf5=>` prompt, type the following command then press **ENTER** to display the FRF.5 statistics.

**`show`** `<fslot.port>`

### Parameter

`<fslot.port>`

The frame card slot and port.

### Example

`::frf5=>` **`show 5.3`**

A screen similar to the following displays.

```
::frf5=> show 5.3

FRF5 statistics for Frame Relay port 5.3 dlci 16:
Cross connect PVC: 0,38 0,1026
number of frames received on this pvc             0
number of frames sent on this pvcc                 110
number of frames received in error on this pvcc    0
number of frames discarded by FR-SSCS on this pvcc 0
```

The following information displays:

- The frame card slot number and port number in the format *slot.port* (for example, port 5.1).
- The DLCI (Data Link Connection Identifier) for this virtual circuit.
- The cross connect frame relay PVCC. This consists of the line card VPI, VCI and the channel card VPI, VCI.
- The number of frames received on this frame relay PVCC.
- The number of frames sent on this frame relay PVCC.
- The number of frames received in error on this frame relay PVCC.
- The number of frames discarded by FR-SSCS on this frame relay PVCC.

## Monitoring FRF.8 Statistics

You access frame relay FRF.8 statistics from the `::frf8=>` prompt. From the `::frame-relay=>` prompt, type **`frf8`** then press **ENTER** to display the `::frf8=>` prompt.

From the `::frf8=>` prompt, type the following command then press **ENTER** to display the FRF.8 statistics.

**`show`** `<fslot.port>`

### Parameter

`<fslot.port>`

The frame card slot and port.

### Example

`::frf8=>` **`show 5.1`**

A screen similar to the following displays.

```
::frf8=> show 5.1

FRF8 statistics for Frame Relay port 5.1 dlci 16:
Cross connect PVC: 128,253 0,1024 :
number of frames received from AAL5                          516028
number of frames sent to AAL5                                512732
number of octets received from AAL5                          35191772
number of octets sent to AAL5                                34793540
number of discards in the receive direction from AAL5        0
number of discards in the transmit direction to AAL5         0
number of unknown protocol frames from AAL5                  0
number of ARP NAK frames discarded                           0
number of frames received from Frame Relay                   512732
number of frames sent to Frame Relay                         515898
number of octets received from Frame Relay                   30691684
number of octets sent to Frame Relay                         31055700
number of discards in the receive direction from Frame Relay 0
number of discards in the transmit direction to Frame Relay  0
```

The following information displays:

- The frame card slot number and port number in the format *slot.port* (for example, port 5.1).
- The DLCI for this virtual circuit.
- The cross connect frame relay PVC. This consists of the line card VPI, VCI and the channel card VPI, VCI.
- The number of frames received from AAL5.
- The number of frames sent to AAL5.
- The number of octets received from AAL5.
- The number of octets sent to AAL5.
- The number of discards in the receive direction from AAL5.
- The number of discards in the transmit direction to AAL5.
- The number of unknown protocol frames from AAL5.
- The number of ARP (Address Resolution Protocol) NAK (Negative Acknowledgement) frames discarded.
- The number of frames received from frame relay.
- The number of frames sent to frame relay.
- The number of octets received from frame relay.
- The number of octets sent to frame relay.
- The number of discards in the receive direction from frame relay.
- The number of discards in the transmit direction to frame relay.

# Monitoring Bridging and Routing 14

This chapter describes how to monitor bridging and routing sessions using the command-line interface.

# MONITORING BRIDGE PORT STATUS

You can monitor the number of discarded packets on each configured logical bridge session port.

You monitor bridge port status using the command-line interface from the `::bridge=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::bridge=>` prompt.

**`display stats bridge`**

Type **`port`** then press **ENTER**.

A screen similar to the following displays.

```
::bridge> port

                                                  Delay                  MTU
BridgePort    Slot    Port    Vpi    Vci          ExceededDiscards       ExceededDiscards
1             1       1       0      1            0                      0
```

| Information | Description |
|---|---|
| BridgePort | The logical bridge session port number. The system automatically assigns this number when you configure a bridging session. |
| Slot<br>Port | The physical slot and port number of the bridge. |
| Vpi<br>Vci | The VPI and VCI of the bridge. |
| Delay ExceededDiscards | The number of packets that were discarded due to excessive delay in forwarding them. |
| MTU ExceededDiscards | The number of packets that were discarded due to the maximum size exceeding the maximum allowable packet size for the logical bridge port. The maximum size is 9K for ATM ports and 1.5K for Ethernet ports. |

# MONITORING STP PORT STATUS

You can monitor the Spanning Tree Protocol information for each configured logical bridge session port.

You monitor STP port status using the command-line interface from the `::bridge=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::bridge=>` prompt.

**`display stats bridge`**

Type **`stp`** then press **ENTER**.

A screen similar to the following displays.

```
::bridge> stp

STP States: BL-Blocking; LS-Listening; LR-Learning; FD-Forwarding; BR-Broken
Column Headers: BP-BridgePort; Pr-Priority; St-State; PC-Path Cost; DC-DesigCost;
DP-DesigPort; FT-FwdTransitions

BP  Pr  St  PC  DesignatedRoot           DC    DesignatedBridge        DP    FT
2   0   FD  40  80 00 46:9a:1j:9b:1h:99  10    80 00 9h:ms:86:kk:2g:9v 0004  0
```

| Information | Description |
|---|---|
| Bridge Port | The logical bridge session port number. The system automatically assigns this number when you configure a bridging session. |
| Priority | The configured Spanning Tree Protocol priority for the session port. |
| Port State | The current Spanning Tree Protocol state of the session port, either **Forwarding**, **Blocked**, or **Learning**. |
| Path Cost | The configured Spanning Tree Protocol path cost for the session port. The Path Cost indicates the efficiency of the session. |
| Designated Root | An eight-byte octet that displays the port priority in hexidecimal (first two bytes) followed by the MAC address of the bridge that is designated as the root, or base, of the Spanning Tree topology. |
| Designated Cost | The cost of the path from the bridge port to the designated root. The range is from 1 to 65535, with 1 indicating the lowest cost. |
| Designated Bridge | An eight-byte octet that displays the port priority in hexidecimal (first two bytes) followed by the MAC address of the bridge that is chosen by the STP to forward traffic to the root. |
| Designated Port | The bridge port that is chosen by the STP to forward traffic to the root. |
| Forward Transitions | The number of times the bridge port state has changed from Learning to Forwarding. The STP changes the bridge state in response to learned topology changes. |

# MONITORING SYSTEM BRIDGE/STP STATISTICS

You can monitor system-wide bridging and Spanning Tree Protocol statistics.

You monitor system bridge/STP statistics using the command-line interface from the `::bridge=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::bridge=>` prompt.

**`display stats bridge`**

Type **`global`** then press **ENTER**.

A screen similar to the following displays.

```
::bridge=>global

Bridge Statistics
Bridge Addr                           : 00:20:a7:10:00:52
Bridge Type                           : transparent-only (2)
Discarded Entries                     : 0

STP Statistics
Protocol                              : ieee 802.1d(3)
Aging Time (sec)                      : 300
Time Since Topology Change            : 36500
Topology Changes Since Reboot         : 1
Designated Root                       : 80 00 00:20:A7:10:00:52
Root Cost                             : 0
Root Port                             : 0
Current Max Age (sec)                 : 20
Current Hello Time (sec)              : 2
Current Hold Time (sec)               : 1
Current Forward Delay (sec)           : 15
```

| Information | Description |
|---|---|
| Bridge Addr | The MAC address of the bridge. |
| Bridge Type | The Avidia system currently supports transparent bridging only. |
| Discarded Entries | The number of entries deleted from the Bridging Table because the Bridging Table has reached the maximum allowable size (4K). |
| Protocol | The STP protocol version in use by the system. The only option currently supported by the system is: ieee8021d—IEEE 802.1d implementations. |
| Aging Time (sec) | The number of seconds after which forwarding information will be deleted from the Bridging Table if it is not re-learned. |
| Time Since Topology Change | The number of seconds that have passed since the STP's learned physical topology of the system last changed. |
| Topology Changes Since Reboot | The number of times the STP's learned physical topology of the system has changed since the management card was last reset. |
| Designated Root | The MAC address of the bridge that is designated as the root, or base, of the STP topology. |
| Root Cost | The cost of the path from the bridge port to the designated root. The range is from 1 to 65535, with 1 indicating the lowest cost. |
| Root Port | The bridge port that is chosen by the STP to forward traffic to the root. |
| Current Max Age (sec) | The maximum age value currently in use in the network, which is determined by the STP root system. This value may be different than the configured maximum age within the system. The maximum age is the number of seconds after which STP entries in the Bridging Table will be deleted if they are not re-learned. |
| Current Hello Time (sec) | The maximum hello time currently in use in the network, which is determined by the STP root system. This value may be different than the configured maximum hello time within the system. The maximum hello time is the interval, in seconds, at which you want the system to send STP packets. |
| Current Hold Time (sec) | The maximum hold time is the interval during which no more than two bridge BPDUs should be transmitted by the system. In the Avidia system this value is always 1 (one second). |
| Current Forward Delay (sec) | The maximum forward delay currently in use by the system, which is determined by the STP root system. This value may be different than the configured maximum forward delay within the system. The maximum forward delay is the number of seconds you want the system to wait before changing the STP state of a particular interface. |

# MONITORING SYSTEM IP STATISTICS

You can evaluate the efficiency of the routing engine by monitoring system IP statistics. The statistics are cumulative since the management card was last reset.

You monitor system IP statistics using the command-line interface from the `::ip=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::ip=>` prompt.

**`display stats ip`**

Type **`global`** then press **ENTER**.

A screen similar to the following displays.

```
::ip=> global

Datagrams Received                          : 1526
Errored Headers                              :0
Errored IP Address                          : 53
Datagrams Forwarded                         : 0
Unknown Protocols                           : 6
Input Datagrams Discarded                   : 0
Datagrams Delivered                         : 1467
Datagrams Transmitted                       : 1309
Output Datagram Discards                    : 0
Output Datagram Discards (No Route)         : 2
Reassembly Timeout                          : 60
Fragments Needed Reassembly                 : 0
Datagrams Reassembled                       : 0
Datagram Reassembly Failures                : 0
Datagrams Fragmented                        : 0
Datagram Fragmentation Failures             : 0
Datagram Fragments Generated                : 0
```

| Information | Description |
|---|---|
| Datagrams Received | The number of IP datagrams received by the system. |
| Errored Header | The number of IP datagrams received by the system that contained errored headers. |
| Errored IP Addresses | The number of IP datagrams received by the system that contained an error in the destination IP address. |
| Datagrams Forwarded | The number of IP datagrams forwarded by the system. |
| Unknown Protocol | The number of IP datagrams received by the system that used a protocol the system does not recognize or support. |
| Input Datagrams Discarded | The number of received IP datagrams discarded by the system. |
| Datagrams Delivered | The number of IP datagrams successfully delivered to the system. |
| Datagrams Transmitted | The number of datagrams generated by the router (e.g., a ping request). |
| Output Datagram Discards | The number of transmitted IP datagrams discarded by the system. |
| Output Datagram Discards (No Route) | The number of packets for which the system did not have an entry in the Routing Table and which were routed using the default route. |
| Reassembly Timeout | The maximum number of seconds that fragments are held for reassembly. This value is always 60. |
| Fragments Needed Reassembly | The number of fragments that have needed reassembly. |
| Datagrams Reassembled | The number of IP datagrams reassembled successfully. |
| Datagram Reassembly Failures | The number of IP datagrams that were unable to be reassembled. |
| Datagrams Fragmented | The number of IP datagrams that were fragmented successfully. |
| Datagram Fragmentation Failures | The number of IP datagrams that were unable to be fragmented successfully. |
| Datagram Fragments Generated | The number of IP datagram fragments produced by the system. |

# MONITORING BRIDGE FORWARDING STATISTICS

You can monitor bridge forwarding and filtering information by MAC address.

You monitor bridge forwarding statistics using the command-line interface from the `::bridge=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::bridge=>` prompt.

**`display stats bridge`**

Type **`fwddb`** then press **ENTER**.

A screen similar to the following displays.

```
::bridge=>

MacAddr                 Port         Status

00:08:c7:29:04:00       1            Learned
```

| Information | Description |
|---|---|
| MAC Address | The learned source address from which packets were forwarded based on the corresponding information in the Bridging Table. |
| Port | The logical bridging port to which packets received from the designated MAC address are forwarded. |
| Status | The status of the Bridge Forwarding Table entry. Options:<br>• Invalid—the entry has been aged out but has not yet been deleted from the table.<br>• Learned—the data in the table entry was learned.<br>• Self—the data in the table entry pertains to the bridge itself.<br>• Mgmt—the data in the table is static (was entered manually).<br>• Other—none of the above status apply (for example, some other MIB object is being used to determine how to forward packets addressed to the corresponding MAC address. |

# MONITORING PHYSICAL INTERFACES 15

This chapter describes how to monitor physical interface statistics using the command-line interface.



You can monitor the number of bytes transmitted and received on all system interfaces at once, or by interface type (ADSL, SDSL frame, SDSL Cell, DS1/T1, DS3, OC3 or Ethernet). You access interface statistics from the `::interfaces=>` prompt. From the `::root=>` prompt type the following command then press **ENTER** to display the `::interfaces=>` prompt.

**`display stats interfaces`**

# MONITORING ADSL INTERFACES

From the `::interfaces=>` prompt, type the adsl command in the following format, then press **ENTER**.

**adsl** [<port>]

### Parameter

[<port>]

The specific port for which you want to display interface statistics (format *slot.port*). Omitting this parameter displays statistics for all ADSL interfaces.

### Examples

::interfaces=> **adsl 4.3**

::interfaces=> **adsl**

The following screen illustrates examples of both adsl interfaces commands.

```
::interfaces=>adsl 4.3

Port   Interface                Speed          Admin    Oper
       Description                             Status   Status
4.3    ADSL DMT physical port   7552000        Up       Up



::interfaces=>adsl

       Interface                               Admin    Oper
Port   Description             Speed          Status   Status
4.1    ADSL DMT physical port  7552000         Up       Up
4.2    ADSL DMT physical port  7527000         Up       Up
4.3    ADSL DMT physical port  7362000         Up       Up
```

The following table describes the information displayed after you type an adsl command.

| Information | Description |
|---|---|
| Port Number | The port number of the interface. |
| Interface Description | A text string describing the type of interface. |
| Speed | The current interface bandwidth in bits per second. |
| Admin Status | The configured state of the interface. Options:<br>• Up—The interface is activated.<br>• Down—The interface is deactivated. |
| Oper Status | The current operational state of the interface. Options:<br>• Up—The interface is operational and ready to receive packets.<br>• Down—The interface is not operational. |

# MONITORING SDSL FRAME INTERFACES

From the `::interfaces=>` prompt, type the following command, then press **ENTER** to display the `::sdsl=>` prompt.

**`sdsl`**

From the `::sdsl=>` prompt, type the frame command, then press **ENTER**.

**`frame`** `[<port>]`

### Parameter

`[<port>]`

The specific port for which you want to display interface statistics (format *slot.port*). Omitting this parameter displays statistics for all SDSL frame interfaces.

### Examples

**::sdsl=> frame 4.3**

**::sdsl=> frame**

The following screen illustrates examples of both frame interface commands.

```
::sdsl=>frame 4.3

               Interface                    Speed     Admin        Oper
Port           Description                            Status       Status
4.3            SDSL 24-port channel card   15360000    up          up

::sdsl=>frame

               Interface                    Speed     Admin        Oper
Port           Description                            Status       Status
4.3            SDSL 24-port channel card   15360000    up          up
4.4            SDSL 24-port channel card   15360000    up          up
```

The following table describes the information displayed after you type a frame interface command.

| Column | Description |
|---|---|
| Port | The port for which the interface statistics are displayed. |
| Interface Description | A text string describing the type of interface. |
| Speed | The current interface bandwidth in bits per second. |
| Admin Status | The configured state of the interface. Options:<br>• up—The interface is activated.<br>• down—The interface is deactivated. |
| Operation Status | The current operational state of the interface. Options:<br>• up—The interface is operational and ready to receive packets.<br>• down—The interface is not operational. |

# MONITORING SDSL CELL INTERFACES

From the `::sdsl=>` prompt, type the cell command in the following format, then press **ENTER**.

**cell** [<port>]

### Parameter

[<port>]

The specific port for which you want to display interface statistics (format *slot.port*). Omitting this parameter displays statistics for all SDSL cell interfaces.

### Examples

::sdsl=> **cell 18.1**

::sdsl=> **cell**

The following screen illustrates examples of both cell interface commands.

```
::sdsl=>cell 18.1

               Interface                       Speed     Admin        Oper
Port           Description                               Status       Status
18.1           SDSL Cell 24-port channel card  15360000   up          up

::sdsl=>cell

               Interface                       Speed     Admin        Oper
Port           Description                               Status       Status
18.1           SDSL Cell 24-port channel card  15360000   up          up
18.2           SDSL Cell 24-port channel card  15360000   up          up
```

The following table describes the information displayed after you type an sdsl cell interface command.

| Column | Description |
|---|---|
| Port | The port for which the interface statistics are displayed. |
| Interface Description | A text string describing the type of interface. |
| Speed | The current interface bandwidth in bits per second. |
| Admin Status | The configured state of the interface. Options:<br>• up—The interface is activated.<br>• down—The interface is deactivated. |
| Oper Status | The current operational state of the interface. Options:<br>• up—The interface is operational and ready to receive packets.<br>• down—The interface is not operational. |

# MONITORING DS1 INTERFACES

From the `::interfaces=>` prompt, type the ds1 command in the following format, then press **ENTER**.

**ds1** [<port>]

### Parameter

[<port>]

The specific port for which you want to display interface statistics (format *slot.port*). Omitting this parameter displays statistics for all DS1 interfaces.

### Examples

::interfaces=> **ds1 4.3**

::interfaces=> **ds1**

The following screen illustrates examples of both ds1 interfaces commands.

```
::interfaces=>ds1 4.3

                   Admin         Oper     LinkUpDown   High  Connector
Port    Speed      Status        Status   TrapEnable   Speed Present
4.3     1544000    up            up       enabled      2     true

::interfaces=>ds1

                  Admin         Oper     LinkUpDown   High  Connector
Port    Speed     Status        Status   TrapEnable   Speed Present
4.1     1544000    up            up       enabled      2     true
4.2     1544000    up            down     enabled      2     true
4.3     1544000    up            up       enabled      2     true
4.4     1544000    up            dormant  enabled      2     true
```

The following table describes the information displayed after you type a ds1 interface command.

| Column | Description |
|---|---|
| Port | The slot and port for which the information is displayed. |
| Speed | The current interface bandwidth in bits per second. |
| Admin Status | The configured state of the interface. Options:<br>• Up—The interface is activated.<br>• Down—The interface is deactivated. |
| Oper Status | The current operational state of the interface. Options:<br>• Up—The interface is operational and ready to receive packets.<br>• Down—The interface is not operational. |
| LinkUpDown TrapEnable | Indicates whether trap generation is enabled or disabled. |
| High Speed | The current speed, in Mbps. This value is rounded to the nearest of the following values:<br>• 2<br>• 6<br>• 8 |
| Connector Present | Whether the physical connector is present or not. True indicates the connector is present. False indicates the connector is absent. |

# MONITORING DS3 INTERFACES

From the `::interfaces=>` prompt, type the ds3 command in the following format, then press **ENTER**.

**ds3** [<port>]

### Parameter

[<port>]

The specific port for which you want to display interface statistics (format *slot.port*). Omitting this parameter displays statistics for all DS3 interfaces.

### Examples

::interfaces=> **ds3 12.1**

::interfaces=> **ds3**

The following screen illustrates examples of both ds3 interface commands.

```
::interfaces=>ds3 12.1

                   Admin        Oper     LinkUpDown   High  Connector
Port    Speed      Status       Status   TrapEnable   Speed Present
12.1     44736000   up           up       enabled      45    true

::interfaces=>ds1

                  Admin        Oper     LinkUpDown   High  Connector
Port    Speed     Status       Status   TrapEnable   Speed Present
12.1     44736000   up           up       enabled     45    true
12.2     44736000   up           up       enabled     45    true
```

The following table describes the information displayed after you type a ds3 interface command.

| Column | Description |
|---|---|
| Port | The slot and port for which the information is displayed. |
| Speed | The current interface bandwidth in bits per second. |
| Admin Status | The configured state of the interface. Options:<br>• up—The interface is activated.<br>• down—The interface is deactivated. |
| Oper Status | The current operational state of the interface. Options:<br>• Up—The interface is operational and ready to receive packets.<br>• Down—The interface is not operational. |
| LinkUpDown TrapEnable | Indicates whether trap generation is enabled or disabled. |
| High Speed | The highest speed attained by the interface, in Mbps. This value is always 45. |
| Connector Present | Whether the physical connector is present or not. True indicates the connector is present. False indicates the connector is absent. |

# MONITORING OC3 INTERFACES

From the `::interfaces=>` prompt, type the oc3 command in the following format, then press **ENTER**.

**oc3** [<port>] [**-path**]

### Parameter

[<port>]

The specific port for which you want to display interface statistics (format *slot.port*). Omitting this parameter displays statistics for all OC3 interfaces.

[**-path**]

Type this parameter when displaying OC3 interfaces to display the SONET Path layer interface statistics. Omitting this parameter displays interface statistics for the SONET Medium, Section and Line layers.

### Examples

::interfaces=> **oc3 12.1**

::interfaces=> **oc3 12.1 -path**

::interfaces=> **oc3**

The following screen illustrates examples of several port commands.

```
::interfaces=>oc3

Port  Speed      Admin Status Oper Status  In_Octets Out_Octets In_Errors
12.1a 155520000  up              up        0          0         0
12.1b 155520000  up              up        0          0         0

::interfaces=>oc3 12.1

Port  Speed      Admin Status Oper Status  In_Octets Out_Octets In_Errors
12.1a 155520000  up              up        0          0         0

::interfaces=>oc3 12.1 -path

Port  Speed      Admin Status Oper Status  In_Octets Out_Octets In_Errors
12.1a 155520000  up              up        0          0         0
```

The following table describes the interface information that displays when you type a port command.

| Information | Description |
|---|---|
| Port | The port number of the interface. |
| Speed | An estimate of the interface current bandwidth in bits per second. |
| Admin Status | The configured state of the interface. Options:<br>• up—The interface is activated.<br>• down—The interface is deactivated. |
| Oper Status | The current operational state of the interface. Options:<br>• up—The interface is operational and ready to receive packets.<br>• down—The interface is not operational. |
| In Octets | The total number of octets received on the interface, including framing characters. |
| Out Octets | The number of octets transmitted out of the interface, including framing characters. |
| In Errors | The number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. |

# MONITORING INTERFACES

From the `::interfaces=>` prompt, type the port command in the following format, then press **ENTER**.

**`port`** `[<portnum>]`

### Parameter

`[<portnum>]`

The specific port for which you want to display interface statistics (format *slot.port*). Omitting this parameter displays statistics for all interfaces.

### Examples

`::interfaces=> `**`port 4.3`**

`::interfaces=> `**`port`**

The following screen illustrates examples of both commands.

```
::interfaces=>port 4.3

Port   in octets     delta     out octets     delta
4.3     144354       24369     216944         18661


::interfaces=>port

Port   in octets     delta     out octets     delta
4.3     144354       24369     216944         18965
4.4     144500       25432     269875         13876
4.5     130000       28476     256436         18654
```

| Column | Description |
|---|---|
| Port | The port to which the row of statistics applies. |
| in Octets | The number of octets received on the interface since it was last reset. |
| delta | The number of octets received on the interface since you last displayed statistics. |
| out octets | The number of octets transmitted on the interface since it was last reset. |
| delta | The number of octets transmitted on the interface since you last displayed statistics. |

# MONITORING SYSTEM ALARMS AND STATUS 16

This chapter describes how to monitor system alarms and messages in the command-line interface.

# MONITORING SYSTEM ALARMS AND EVENTS

You monitor system alarms and events from the `::admin=>` prompt. From the `::root=>` prompt, type **`admin`** then press **ENTER** to display the `::admin=>` prompt.

To display information about alarms and events that have occurred since the system was powered up, including internal alarms such as memory and system fans, from the `::admin=>` prompt type the log command in the following format then press **ENTER**.

**`log`** `(`**`alarm|all|debug|error|info|trace`**`)`

### Parameter

`(`**`alarm|all|debug|error|info|trace`**`)`

**`alarm`** displays the alarms that have occurred since the system was powered up

**`all`** displays all system events, including alarms, traps, changes in slot status and diagnostic traces

**`debug`** is for technician use only

**`error`** is for technician use only

**`info`** is for technician use only

**`trace`** is for technician use only

### Examples

`::admin=>`**`log alarm`**

`::admin=>`**`log all`**

When you type **`log alarm`**, a screen similar to the following displays.

```
::admin=>log alarm

Timestamp                 Type  Slot  Description

THU DEC 23 06:50:40 1999  alarm       Critical, Alarm#100:chassis power alarm
THU DEC 23 06:50:40 1999  alarm   4   No Alarm, Alarm #104:chassis line card
                                      down
```

The following table describes the alarm information that displays when you type the log alarm command.

| Information | Description |
|---|---|
| Timestamp | The time and date the alarm occurred. |
| Type | The type of event. Options:<br>• alarm—An alarm has occurred or been cleared.<br>• trap—A trap has been sent.<br>• bintrace—A binary trace has been sent. This information is for technician use only.<br>• txttrace—Additional details regarding about the sent traps. This information is for technician use only. |
| Slot | The slot number associated with the alarm. |
| Description | Reports the alarm severity, Alarm ID and description as obtained from the alarm description database. |

When you type **log all**, a screen similar to the following displays.

```
::admin=>log all

Timestamp                    Type       Slot   Description

THU, DEC 23 1999 06:50:40   txttrace           InitIbc: OK
THU, DEC 23 1999 06:50:40   trace      4      Trap: chassis config change
THU, DEC 23 1999 06:50:40   alarm      6      No Alarm, Alarm #104: chassis
                                               line card down
```

The following table describes the information that displays when you type the log all command.

| Information | Description |
|---|---|
| Timestamp | The time and date the event occurred. |
| Type | The type of event that occurred. Options:<br>• alarm—Displays when an alarm has occurred or been cleared.<br>• trap—Displays when a trap has been sent.<br>• bintrace—Displays when a binary trace has been sent. This information is for technician use only.<br>• txttrace—Provides a more detailed explanation of the sent traps. This information is for technician use only. |
| Slot | The slot associated with the description. |
| Description | A description of the event that occurred. The description is reported by the alarm manager as follows:<br>• Alarms—Reports the alarm severity, Alarm ID and description as obtained from the alarm description database.<br>• Trap—Reports the detailed description of the trap as obtained from the alarm description database.<br>• Bintrace—Reports the text of the binary message that was sent. This information is for technician use only.<br>• Txttrace—Reports the specific change that has occurred in the slot. This information is for technician use only. |

# MONITORING SDSL FRAME ALARMS

You can monitor SDSL frame current alarm status and alarm history.

## Monitoring SDSL Frame Alarm Status

You view the SDSL frame alarm table from the `::frame=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frame=>` prompt.

**`display stats sdsl frame`**

To display the SDSL frame alarm table, type the alarm command as follows then press **ENTER**.

**`alarm`** `[<port>]`

### Parameter

`[<port>]`

The number of the SDSL frame port for which you want to display alarm information. Omitting this parameter displays alarm information for all SDSL frame ports.

### Examples

`::frame=>` **`alarm 3.7`**

`::frame=>` **`alarm`**

A screen similar to the following displays.

```
::frame=>alarm 3.7


                        Network                          Customer
Port    LOSW        Margin    ES     UAS          Margin    ES     UAS
3.7      0             0       0      0              0       0      0

::frame=>alarm


                           Network                          Customer
Port    LOSW        Margin    ES     UAS          Margin    ES     UAS
3.1      0             0       0      0              0       0      0
3.2      0             0       0      0              0       0      0
3.3      0             0       0      0              0       0      0
3.4      0             0       0      0              0       0      0
3.5      0             0       0      0              0       0      0
3.6      0             0       0      0              0       0      0
3.7      0             0       0      0              0       0      0
```

The following table describes the SDSL frame alarm history information that displays when you type the display alarm command.

| Alarm Type | Description |
|---|---|
| Slot<br>Port | The slot and port of the card for which the alarm information is displayed. |
| LOSW | Loss of Sync Word. The number of seconds during which one of the SDSL frame loops was out of sync. |
| Margin (Network/Customer) | The number of seconds the actual margin exceeded the configured threshold. |
| ES (Network/Customer) | Errored Seconds. The number of seconds during which errors occurred that prevented the payload from being corrected. |
| UAS (Network/Customer) | Unavailable Seconds. The number of seconds during which the line was unavailable. Unavailable seconds are seconds during which the SDSL frame loop is not synchronized. |

## Monitoring SDSL Frame Alarm History

You view the SDSL frame alarm history from the `::alarm=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::alarm=>` prompt.

**`display alarm`**

To display SDSL frame alarm history, type the sdsl command as follows then press **ENTER**.

**`sdsl`** `[<port>]`

### Parameter

`[<port>]`

The number of the SDSL port for which you want to display alarm history. Omitting this parameter displays alarm history for all SDSL ports.

### Examples

`::alarm=>` **`sdsl 3.1`**

`::alarm=>` **`sdsl`**

A screen similar to the following displays.

```
::alarm=>sdsl 3.1

                         SDSL ALARM HISTORY OF PORT 3.1

                           First Occurred        Last Occurred         Count
      Margin Alarm:      0:00:31 01/01/1999     0:00:31 01/01/1999        1
Errored Seconds Alarm:          n/a                    n/a                0
Unavailable Seconds Alarm:      n/a                    n/a                0
Loss of Sync Word Alarm:        n/a                    n/a                0
```

The following table describes the SDSL frame alarm history information that displays when you type the display alarm command. The date and time each alarm first occurred and the date and time each alarm last occurred displays for each alarm type. The Count column displays the number of times the alarm has occurred since the SDSL frame card was last reset.

| Alarm Type | Description |
|---|---|
| Margin Alarm | A margin alarm occurs when the margin falls below the specified threshold. |
| Errored Seconds Alarm | An errored seconds alarm occurs when the number of errored seconds in the current 15-minute data collection interval exceeds the specified threshold. |
| Unavailable Seconds Alarm | An unavailable seconds alarm occurs when the number of unavailable seconds in the current 15-minute data collection interval exceeds the specified threshold. |
| Loss of Sync Word Alarm | A Loss of Sync Word alarm occurs when one of the SDSL frame loops is out of sync. |
| Count | The number of times the Loss of Sync Word alarm has occurred since the port was last reset. |

# MONITORING SDSL CELL ALARMS

You view the SDSL cell alarm table from the `::cell=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::cell=>` prompt.

**`display stats sdsl cell`**

To display the SDSL cell alarm table, type the alarm command as follows then press **ENTER**.

**`alarm`** `[<port>]`

### Parameter

`[<port>]`

The number of the SDSL cell port for which you want to display alarm information. Omitting this parameter displays alarm information for all SDSL cell ports.

### Examples

`::cell=>` **`alarm 18.1`**

`::cell=>` **`alarm`**

A screen similar to the following displays.

```
::cell=>alarm 18.1


*****SDSL Cell Current Alarm Status Port 18.1*****
LOSS      Alarm:     inactive(1)
LOCD      Alarm:     inactive(1)
SLOCD     Alarm:     inactive(1)
SNR       Alarm:     inactive(1)
Hardware Status:     ok(1)
   Last Changed: Thu, Jul 13 2000 12:27:58

::cell=>alarm


*****SDSL Cell Current Alarm Status Port 18.1*****
LOSS      Alarm:     inactive(1)
LOCD      Alarm:     inactive(1)
SLOCD     Alarm:     inactive(1)
SNR       Alarm:     inactive(1)
Hardware Status:     ok(1)
   Last Changed: Thu, Jul 13 2000 12:27:58

*****SDSL Cell Current Alarm Status Port 18.2*****
LOSS      Alarm:     inactive(1)
LOCD      Alarm:     inactive(1)
SLOCD     Alarm:     inactive(1)
SNR       Alarm:     inactive(1)
Hardware Status:     ok(1)
   Last Changed: Thu, Jul 13 2000 12:27:58

Press ‘Return’ or ‘Enter’ to continue or ‘q’ to quit....
```

The following table describes the SDSL cell alarm history information that displays when you type the display alarm command.

| Alarm Type | Description |
|---|---|
| Port | The slot and port of the card for which the alarm information is displayed. |
| LOSS | Loss of signal seconds are seconds during which the SDSL cell line is incapable of transmitting or receiving data and all data is lost. |
| LOCD | Loss of cell delineation seconds are seconds in which some cells transmitted during that second were lost. |
| SLOCD | Severe loss of cell delineation seconds are seconds in which the total number of LOCD events in that second exceed 50% of the total bandwidth available during that second. During a severe loss of cell delineation second most of the cells transmitted during that second are lost. |
| SNR | SNR margin is a measure of signal quality indicating how much margin can be dropped before the number of bit errors exceeds the ratio of 1x10-7 errored bits per bits transmitted. |
| Hardware Status | The status of the hardware. |
| Last Changed | The last time the status of an alarm changed. |

# MONITORING IDSL ALARM STATUS

Alarm status displays a summary of the alarm data for a specified IDSL line and port.

You access IDSL alarm status from the `::idsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::idsl=>` prompt.

**`disp stats idsl`**

From the `::idsl=>` prompt, type the following command then press **ENTER** to display the alarm status.

**`alarm`** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to display the alarm status (format *slot.port*). Omitting this parameter displays the alarm status for all configured IDSL channels.

### Examples

`::idsl=>` **`alarm 5.1`**

`::idsl=>` **`alarm`**

A screen similar to the following displays.

```
::idsl=> alarm 5.2

           *****     THE IDSL ALARM STATUS TABLE FOR PORT 5.2     *****
                             Loss of Signal (LOS):     inactive(1)

              Network Hourly Errored Seconds (ES):       active(2)

    Network Hourly Severely Errored Seconds (SES):     inactive(1)

               Network Daily Errored Seconds (ES):     inactive(1)

     Network Daily Severely Errored Seconds (SES):     inactive(1)

             Customer Hourly Errored Seconds (ES):     inactive(1)

   Customer Hourly Severely Errored Seconds (SES):     inactive(1)

              Customer Daily Errored Seconds (ES):     inactive(1)

    Customer Daily Severely Errored Seconds (SES):     inactive(1)

                                     Last Change:     Thu, Jan 01 1970 00:00:00
```

**Network** indicates statistics for the upstream direction, toward the network. **Customer** indicates statistics for the downstream direction, toward the customer.

| Information | Description |
|---|---|
| Port | The slot number and port number for which alarm status is displayed. |
| Loss of Signal (LOS) | The Loss of Signal alarm status (active or inactive). An LOS alarm is reported when the signal is lost or when 40 consecutive ISDN frames are lost. |
| Hourly Errored Seconds (ES) (Network/Customer) | The Hourly Errored Seconds alarm status (active or inactive). |
| Daily Errored Seconds (ES) (Network/Customer) | The Daily Errored Seconds alarm status (active or inactive). |
| Hourly Severely Errored Seconds (SES) (Network/Customer) | The Hourly Severely Errored Seconds alarm status (active or inactive). |
| Daily Severely Errored Seconds (SES) (Network/Customer) | The Daily Severely Errored Seconds alarm status (active or inactive). |
| Last Time Change | The date and time the alarm status changed. |

# MONITORING SYSTEM HARDWARE STATUS

You monitor system status information, such as fuse and power alarms, and whether a critical, major or minor alarm condition exists. From the `::root=>` prompt, type the following command then press **ENTER**.

**`display hardware system`**

A screen similar to the following displays.

```
::hardware=> system

Power Fan CRT MAJ MIN AUD FAN1 FAN2 FAN3 FAN4 PWR_MIN IP1  IP2  FU1  FU2
OK    OK  OFF OFF OFF ON  OFF  OFF  OFF  OFF   ON     OFF  OFF  OFF  OFF

Port       Card Description        Most_Serious_Alarm       Severity
1          Avidia Management Card  PSFailureAlarm           Critical
```

The following table describes the system status information that displays when you type the display hardware system command.

| Information | Description |
|---|---|
| Power | Chassis power supply status. Options:<br>• Unknown—Unknown power supply status.<br>• Failure—One or both power supplies has failed.<br>• OK—Both power supplies are operational. |
| Fan | Chassis fan status. Options:<br>• Unknown—Unknown fan status or no fans exist.<br>• Failure—One of the fans has failed.<br>• OK—All fans are operational.<br>• Hightemp—The chassis temperature is higher than the range required for operation. |
| CRT | Chassis critical alarm LED status. Indicates whether a critical alarm condition exists. Displays either OFF or ON. |
| MAJ | Chassis major alarm LED status. Indicates whether a major alarm condition exists. Displays either OFF or ON. |

| Information | Description |
|---|---|
| MIN | Chassis minor alarm LED status. Indicates whether a minor alarm condition exists. Displays either OFF or ON. |
| AUD | Indicates whether an audio alarm is activated. Displays either OFF or ON. |
| FAN1, FAN2, FAN3, FAN4 | Chassis fan LED status. Displays either OFF or ON. |
| PWR_MIN | Power minor alarm LED status. Indicates whether a power minor alarm condition exists. Displays either OFF or ON. |
| IP1 and IP2 | Chassis input power 1 and input power 2 LED status. Indicate whether the battery is providing -48 Vdc power. Displays either OFF (not providing power) or ON (providing power). |
| FU1 and FU2 | Chassis fuse 1 and Chassis fuse 2 LED status. Indicate whether the fan tray fuses have blown. Displays either OFF (fuses have blown) or ON (fuses are OK). |
| Port | The port on which the most serious alarm in the system is occurring. |
| Card Description | A description of the card on which the most serious alarm is occurring. |
| Most_Serious_Alarm | The most serious alarm type that is occurring in the system. Options:<br>• PSFailureAlarm—One or more chassis power inputs is down.<br>• FanFailureAlarm—One or more of the four chassis fans is down.<br>• ConfigChangeAlarm—A configuration change has occurred.<br>• TempExceedThreshAlarm—The chassis temperature has exceeded the allowable threshold. This threshold is not user configurable.<br>• LineCardDown alarm—The management card cannot communicate with the line card.<br>• CellBusDown alarm—The cell bus is not operational. |
| Severity | The severity of the most serious alarm that is occurring in the system. |

# System Maintenance and Administration 17

The command-line interface provides several convenient maintenance and administrative features. Go to the appropriate section listed below, based on the task you want to perform.



You perform most maintenance and administration tasks from the `::admin=>` prompt. From the ::root=> prompt, type **`admin`** then press ENTER to display the `::admin=>` prompt.

# CONFIGURING AND INITIATING OAM LOOPBACKS

OAM loopbacks enable the testing of PVCs by sending cells from one connection point of a PVC to another, where they are looped back to the originating point. Before beginning any OAM loopbacks, ensure that the OAM Source Location ID is set for the Avidia system as described in the following paragraph.

## Setting the System OAM Source Location ID

It is important to set the OAM Source Location ID for the Avidia system, as it enables the system to determine whether or not it is the originator of received loopback cells. The Source Location ID default is ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff. Set a unique Location ID prior to initiating a loopback, as other devices involved in the loopback could default to the same Location ID. It is recommended that the OAM Source Location ID address for the Avidia system is set up with:

- a unique address that is meaningful to you for the first 13 octets
- all zeros for the last three octets

Configure the OAM Source Location ID from the `::oam=>` prompt.

1 From the ::root=> prompt, type the following command then press **ENTER** to display the `::oam=>` prompt.

   **`configuration atm oam`**

2 Type the setlocation command in the following format, where *x* is an integer 0 - 9 or an alpha character a - f, then press **ENTER**.

   **`setlocation`** *`<xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx>`*

### Example

`::oam=>` **`setlocation a1:c3:c2:f5:00:bb:23:c7:92:d5:e3:23:9a:11:ff:73`**

## Configuring and Initiating OAM Loopbacks

Configure and initiate OAM loopbacks from the `::atm=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::atm=>` prompt:

**`diagnostic atm`**

Select either an F4 OAM loopback or an F5 OAM loopback by doing one of the following:

- Type the f4oamloopback command in the following format, then press **ENTER**.

**f4oamloopback** <port> <vpi> [**-type** (**segment|end2end**)] [**-count** <count>] [**-timeout** <sec>] [**-delay** <sec>] [**-trap** (**send|donotsend**)] [**-location** <location>]

- Type the f5oamloopback command in the following format, then press **ENTER**.

**f5oamloopback** <port> <vpi> <vci> [**-type** (**segment|end2end**)] [**-count** <count>] [**-timeout** <sec>] [**-delay** <sec>] [**-trap** (**send|donotsend**)] [**-location** <location>]

### Parameters

<port>

The port from which the OAM loopback is initiated.

<vpi>

The VPI of the VPC or VCC.

<vci>

The VCI of the VCC only.

[**-type** (**segment|end2end**)]

The loopback type of either segment or end-to-end.

OAM F4 and F5 flow segment loopbacks test the connectivity between any two uniquely addressable points in a VPC or VCC, respectively.

OAM F4 and F5 flow end-to-end loopbacks test the connectivity between any uniquely addressable point in the VPC or VCC, respectively, and any end point (such as a modem or network end point) where a VPC or VCC terminates.

[**-count** <count>]

The total number of cells to be sent (cells are sent one at a time). The range is 1 to 10.

[**-timeout** <sec>]

The number of seconds allowed for the looped back cells to return to the originating device before the loopback is designated as failed. The range is 5 - 15.

[**-delay** <sec>]

The number of seconds the system will wait between transmitted cells. The range is 5 to 15.

[**-trap** (**send**|**donotsend**)]

Type **-trap send** to enable the system to send a trap when the loopback is completed. Type **-trap donotsend** if you do not want the system to send a trap.

[**-location** <location>]

The OAM location ID of the device where the cells will be looped back to the originating device (format *xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx* where x is an integer 0 - 9 or an alpha character a - f.

### Example

```
::atm=> f5oamloopback 4.2 0 100 -type segment -count 10 -timeout
15 -delay 5 -trap send -location ff:ff:ff:ff:ff:ff:
ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:
```

# INITIATING COMMUNICATION PATH LOOPBACKS

The Avidia system supports loopbacks that enable you to test the data communication path between a card in the Avidia system and another device with the same transmission. You can run these loopbacks on DS1/DSX-1, DS3, and OC3 lines. The end-points for these tests are the near-end, which is the local Avidia card, and the far-end, which is the device (this could be another Avidia card) that is the remote end for the test.

When you initiate a loopback test on a data communication path, normal service is interrupted for that path until the test is cancelled. The system is then returned to normal operation.

The following table lists supported loopbacks.

| Loopback Type | Card(s) Supported | Description |
|---|---|---|
| Local | OC3<br>DS1<br>DS3 | For this loopback, the signal is looped back within the line card at the transceiver. |
| Line | OC3<br>DS1/DSX-1<br>DS3 | For this loopback, the signal is received at the line interface and is looped back through the transmitter. The near-end interface receives the loopback from the far-end device. You can activate this test either from the near-end or far-end.<br>A line loopback tests the complete signal for the port, including channels that are blocked by the user. |
| Payload | DS1/DSX-1 | For this loopback, framing for the DS1/DSX-1 port must be set to ESF. The DS1/DSX-1 card loops the payload (192 bits) through the receive section (including the framer) and to the transmit section, returning the payload and the newly generated ESF framing. |
| Remote | DS1/DSX-1<br>DS3 | For this loopback, the signal is sent to the far-end where it is looped back. This loopback tests the entire data path to the far-end. |

See the following sections to initiate loopbacks for specific line card types:

"Initiating OC3 Loopbacks" on page 346

"Initiating DS1 Loopbacks" on page 346

"Initiating DS3 Loopbacks" on page 347

## Initiating OC3 Loopbacks

Configure OC3 service from the `::oc3=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::oc3=>` prompt.

```
configuration oc3
```

From the `::oc3=>` prompt, type the set command in the following format then press **ENTER**.

```
set <port> [-loopback (none|local|line)]
```

**The set command is also used to configure OC3 ports. See "Configuring OC3 Service" on page 142 for information about OC3 port configuration parameters.**

### Parameters

```
[-loopback (none|local|line)]
```

The type of loopback to start, if any. See the table on page 345 for information. Type **-none** to cancel the loopback.

### Examples

```
::oc3=> set 12.1 -loopback line
::oc3=> set 12.1 -loopback none
```

## Initiating DS1 Loopbacks

Configure DS1/DSX-1 channels from the `::ds1=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::ds1=>` prompt.

```
configuration ds1
```

From the `::ds1=>` prompt, type the set command in the following format then press **ENTER**.

```
set <port> [-loopback (none|local|line|payload|remote)]
```

**The set command is also used to configure DS1 ports. See "Configuring DS1 Service" on page 143 for information about DS1 port configuration parameters.**

#### Parameters

`[`**`-loopback`**` (`**`none`**`|`**`local`**`|`**`line`**`|`**`payload`**`|`**`remote`**`)]`

The type of loopback to start. See the table on page 345 for information. Type **none** to cancel the loopback.

#### Examples

`::ds1=>` **`2.1 -loopback payload`**

`::ds1=>` **`2.1 -loopback none`**

## Initiating DS3 Loopbacks

Configure DS3 service from the `::ds3=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::ds3=>` prompt.

**`configuration ds3`**

From the `::ds3=>` prompt, type the set command in the following format then press **ENTER**.

**`set`** `<port> [`**`-loopback`**` (`**`none`**`|`**`local`**`|`**`line`**`|`**`remote`**`)]`

**The set command is also used to configure DS3 ports. See "Configuring DS3 Service" on page 149 for information about DS3 port configuration parameters.**

#### Parameters

`[`**`-loopback`**` (`**`none`**`|`**`local`**`|`**`line`**`|`**`remote`**`)]`

The type of loopback to start. See the table on page 345 for information. Type **none** to cancel the loopback.

#### Examples

`::ds3=>` **`set 12.1 -loopback local`**

`::ds3=>` **`set 12.1 -loopback none`**

# MANAGING IDSL DIAGNOSTICS

IDSL diagnostics consist configuring and initiating IDSL loopbacks and the corrupted CRC test for a node or the entire connection path (loop). Corrupted CRC test results can be viewed (see "Monitoring IDSL Current Performance" on page 274).

## Clearing Statistics

You clear IDSL current performance statistics (see page 274) from the `::idsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::idsl=>` prompt.

**`diag idsl`**

Type the statclear command in the following format, then press **ENTER**.

**`statclear`** `<port> [<node>]`

### Parameters

`<port>`

The port for which you want to clear the current performance statistics (format *slot.port*).

`[<node>]`

The node ID for which you want to clear the current performance statistics. Omitting this parameter clears performance statistics for all nodes.

### Example

`::idsl=>` **`statclear 5.1 3`**

# Configuring and Initiating IDSL Loopbacks

You can configure loopbacks on a specific loopback point for each port. The loopbacks occur in both the customer (downstream) and network (upstream) directions. The performance monitoring mode setting determines how statistics are collected (see "Configuring IDSL Line Profiles" on page 127 for details).

You configure and initiate IDSL loopbacks from the `::idsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::idsl=>` prompt.

**`diag idsl`**

Type the loopback command in the following format, then press **ENTER**.

**`loopback`** `<port> (`**`enable|disable`**`) [<node>]`

### Parameters

`<port>`

The port for which you want to enable or disable loopbacks (format *slot.port*).

`(`**`enable|disable`**`)`

Enable or disable loopbacks.

`[<node>]`

The testing node (this specifies the loopback point). The testing node values are 0 (Avidia system) to 7. Omitting the testing node parameter enables or disables loopbacks on the Avidia system (node 0). To determine the number of nodes for a specific port, display the IDSL loopback and corrupted CRC test configuration (see page 351). The number of nodes is one less than the number of segments.

**The node setting applies to both loopbacks and the corrupted CRC test.**

### Example

`::idsl=>` **`loopback 5.1 enable 3`**

## Configuring and Initiating Corrupted CRCs

The corrupted CRC test generates CRC errors on the IDSL line. If the testing node is odd numbered (node 1, 3, 5, or 7), the CRCs generate upstream (toward the network). If the testing node is even numbered (0, 2, 4, or 6), the CRCs generate downstream (toward the customer). CRC errors cause traps when the alarm thresholds specified by the alarm profile are met or exceeded (see “Configuring IDSL Line Profiles” on page 127). The results can be viewed (see “Monitoring IDSL Current Performance” on page 274).

You configure and initiate IDSL corrupted CRC tests from the `::idsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::idsl=>` prompt.

```
diag idsl
```

Type the loopback command in the following format, then press **ENTER**.

```
crctest <port> (enable|disable) [<node>]
```

### Parameters

<port>

The port for which you want to enable or disable the corrupted CRC test (format *slot.port*).

(**enable|disable**)

Enable or disable the corrupted CRC test.

[<node>]

The testing node. The testing node values are 0 (Avidia system) up to 7. Omitting the testing node parameter enables or disables the corrupted CRC test on the Avidia system (node 0). To determine the number of nodes for a specific port, display the IDSL loopback and corrupted CRC test configuration (see page 351). The number of nodes is one less than the number of segments.

**The node setting applies to both loopbacks and the corrupted CRC test.**

### Example

```
::idsl=> crctest 5.4 enable 1
```

## Displaying IDSL Loopback and Corrupted CRC Test Configurations

You view IDSL loopback and corrupted CRC test settings from the `::idsl=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::idsl=>` prompt.

**`disp stats idsl`**

Type the following command in the following format, then press **ENTER**.

**`line`** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to display the diagnostic test configuration (format *slot.port*). Omitting this parameter displays the configurations for all configured IDSL channels.

### Examples

`::idsl=>` **`line 5.1`**

`::idsl=>` **`line`**

The following screen illustrates an example of both line idsl commands.

```
::idsl=> line 5.1

                                  Node        Diag
Port    Up_State    Num_Seg         Id        Code
 5.1        down          0          0    Loopback


::idsl=> line

                                 Node       Diag
Port   Up_State    Num_Seg         Id       Code
 5.1       down          4          3   Loopback
 5.2         up          0          0    CrcTest
 5.3       down          0          0  Loopback CrcTest
 5.4    waiting          5          1    CrcTest
 5.5       down          0          0
 5.6       down          0          0
 5.7       down          0          0
 5.8       down          0          0
 5.9       down          0          0
5.10       down          0          0
5.11       down          0          0
5.12       down          0          0
5.13       down          0          0
5.14       down          0          0
```

| Information | Description |
|---|---|
| Port | The slot number and port number of the IDSL card. |
| Up_State | The current state of the IDSL Interface. Options:<br>• Up—The loop is up and active.<br>• Sync—The loop has synchronized with the first node.<br>• Training—The loop is training the Digital Front End (DFE).<br>• Waiting—The loop is waiting for a signal.<br>• Down—The loop is down or disabled. |
| Num_Seg | The total number of segments on the loop. |
| Node ID | The node tested. The values are 0 (Avidia system) up to 7. |
| Diag Code | The type of diagnostic enabled.<br>• Loopback—Loopbacks are enabled on this port.<br>• CrcTest—The Corrupted CRC test is enabled on this port. |

# DETECTING NETWORK DEVICES

Use the `ping` command to detect whether a network device is online. When you issue a `Ping` command, an IP packet is sent to the requested remote device. If the target device receives the packet, it sends a reply back to the Avidia system, indicating that the target is online.

From the ::admin=> prompt, type the ping command in the following format then press **ENTER**.

**ping** (<address>**|abort|results**) [<count>] [**-silent**]

### Parameters

(<address>**|abort|results**)

Defines the type of command.

<address>

The IP address of the network device, in *xxx.xxx.xxx.xxx* format.

**abort**

Aborts an existing ping command.

**results**

Displays the results of the most recent ping command.

<count>

The number of ping packets to be sent to the remote address.

[**-silent**]

Specifies that ping status does not display on the screen.

### Example

::admin=>**ping 123.456.789.012 12**

# MANAGING IMAGE FILES

It is recommended that you upload a copy of all configuration files to a TFTP server, so that you can easily download and restore the files if they get corrupted.

You manage image files from the `::admin=>` prompt. At the `::root=>` prompt, type **`admin`** then press **ENTER** to display the `::admin=>` prompt.

## Uploading Files to a TFTP Server

To back up files from the Avidia system to a TFTP server:

1. Make sure the system to which you want to upload files is running as a TFTP server.
2. From the `::admin=>` prompt, type the upload command in the following format then press **ENTER**.

   **`upload`** `<slot> <file name> <remote host>:<full path to remote file>`

### Parameters

`<slot>`

The slot number from which you want to upload the file.

`<file name>`

The complete path and filename of the file you want to upload, using a forward slash (/) to indicate a directory.

`<remote host>`

The IP address of the PC to which you want to upload the file. The default TFTP server IP address is 192.168.0.100.

`<full path to remote file>`

The complete destination path and filename. You can only specify directory names that are subdirectories of the TFTP server default directory. See your TFTP server documentation to determine the required path syntax. If the destination path and filename are not specified, this parameter defaults to the same path and filename as the source file.

### Example

```
::admin=> upload 3 amc.cnf 137.15.11.5:/temp/amc.cnf
```

## Downloading Files from a TFTP Server

You can restore Avidia system files by downloading the files from a TFTP server. Prior to downloading system files, it is recommended that you create a backup copy of your existing image file (if it is valid), using an .alt file name extension. See “Copying Files” on page 356 for instructions. Be sure to download a complete set of system files to prevent version conflicts between files.

**When restoring files, be sure to download a complete set of system files to prevent version conflicts between files.**

1. Make sure the system from which you want to download files is running as a TFTP server.
2. From the `::admin=>` prompt, type the download command in the following format then press **ENTER**.

   **download** <remote host>:<full path to remote file> <slot> [<file name>]

   The system downloads the file and, if it is an image file, temporarily renames the file name extension to .new until the file is booted and verified.
3. Reset the card to which you downloaded the file(s) to load the new file(s) (unless you only downloaded the cli.tcl file). See “Rebooting Cards” on page 366 for instructions.

   The system attempts to boot the image file that has the .new file name extension. If the image file is valid, the system renames the file name extension to .bin and overwrites the previous image file. If the new image file is not valid, the system attempts to boot the image file that has the .bin file name extension. If that image file is not valid, the system boots the backup copy of the image file that has an. alt file name extension (if you created one). If the system cannot find a valid image file it loads the boot monitor, from which you can download a new image file, and the management card fault LED lights.

### Parameters

`<remote host>`

The IP address of the computer from which you want to download the file.

`<full path to remote file>`

The complete system path and filename of the file you want to download, using a forward slash (/) to indicate a directory.

`<slot>`

The slot number to which you want to download the file. To download the file to multiple slots, type each slot number separated by a space.

`[<file name>]`

The complete destination path and filename, using a forward slash (/) to indicate a directory. If the destination path and filename are not specified, this parameter defaults to the same path and filename as the source file.

### Example

`::admin=>` **`download 137.15.11.5:/temp/amc.bin 1 amc.bin`**

## Copying Files

You can restore the system files required to run a particular card by copying the files from another card of the same type.

From the `::admin=>` prompt, type the copy command in the following format then press ENTER.

**`copy`** `<slot> <file name> <slot> [<file name>]`

### Parameters

`<slot>`

The slot number of the card containing the file you want to copy.

`<file name>`

The name of the file you want to copy.

`<slot>`

The slot number to which you want to copy the file. To copy the file to multiple slots, type each slot number separated by a space.

`[<file name>]`

The name of the file copy. If the destination path and filename are not specified, this parameter defaults to the same path and filename as the source file.

### Examples

`::admin=>` **`copy 1 bigfile.txt 10 bigfile.txt`** (Copies the file to a different card using the same file name.)

`::admin=>` **`copy 1 amc.bin 1 amc.alt`** (Copies the file to a different file name on the same card.)

## Displaying a Directory of Files on a Card

To display a directory of all the files stored in NVRAM on a particular card, from the `::admin=>` prompt, type the directory command in the following format, then press **ENTER**.

**`dir`** `[<slot>]`

### Parameter

`<slot>`

The slot number for which you want to display a directory of files. The default value is 1.

### Example

`::admin=>` **`dir 5`**

A screen similar to the following displays.

```
::admin=> dir 5

Name              Size            Modified

AMCPROF.TXT         79          04-19-1999   15:07:28
ATM.CNF           3434          01-01-2099   00:08:46
AMC.CNF          10481          04-29-1999   10:13:12
CLI.TCL         241040          04-19-1999   15:06:58
WEB_UI.BIN     1226160          04-29-1999   10:28:44
AMC.BIN         814400          04-29-1999   10:25:10
```

# DOWNLOADING FILES TO A MODEM

You can download files from an ADSL, SDSL frame, or SDSL cell channel card to an attached modem, however you can only download a single file to a single modem at one time.

You download files to a modem from the `::admin=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::admin=>` prompt:

**`admin`**

Type the modemxfer command in the following format then press **ENTER**.

**modemxfer** <slot> <src file name> <port> [<dst file name>]

### Parameters

<slot>

The slot containing the card from which you want to download files.

<src file name>

The complete name of the file you want to download, including the file name extension.

<port>

The port to which the modem is attached.

[<dst file name>]

The complete name under which you want to store the downloaded file on the modem, including the file name extension.

### Example

::admin=> **modemxfer 4 tiger.bin 2 tiger.bin**

# MANAGING SECURITY

The command-line interface comes with the user account *admin* and password *dslam* preconfigured. You can change the *admin* password, however you cannot delete the *admin* user account. You can add up to 11 additional user accounts, and configure the password, security level and access methods for each account. You can also modify user account information and delete user accounts.

You configure user accounts from the `::user=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::user=>` prompt.

**`admin user`**

## Adding User Accounts

1. From the `::user=>` prompt, type the `new` command in the following format then press **ENTER**.

   **`new`** `<name> <security level> <access method>`

   A password prompt displays.

2. Type a password for the user account then press **ENTER**.
3. At the prompt, retype the password then press **ENTER**.

### Parameters

`<name>`

The unique user name for the account. This is the name the user will use to log on to the command-line interface. The user name must contain between four and 16 alphanumeric characters and the first character must be a letter. The user name cannot contain spaces, but can contain multiple words separated by an underscore.

`<security level>`

The access level for the account. Choose one of the following.

| Security Level | Abbreviation | View Information | Configure All Information Except User Accounts | Configure User Accounts |
|---|---|---|---|---|
| Monitoring | Mon | Yes | No | No |
| Provisioning | Pro | Yes | Yes | No |
| Administrator | Admin | Yes | Yes | Yes |

`<access method>`

The method(s) by which the user is allowed to access the command line interface. For multiple access methods, list the letter for each. Options:

- **T** allows access through a Telnet session
- **C** allows access through a serial craft port connection
- **W** allows access through a Web connection
- **F** allows access through an FTP site

### Examples

```
::user=> new general_access mon c
::user=> new manager admin tcwf
```

## Displaying User Accounts

From the `::user=>` prompt, type the `show` command then press **ENTER**.

**`show`**

The following screen illustrates an example of the show command.

```
::user=> show
 Index  UserName       Security Level      Access Method
 ------------------------------------------------------
 1      admin          Administrator       TntCrfWebFtp
 2      general_access Monitor             Crf
 3      manager        Administrator       TntCrfWebFtp
```

## Modifying User Accounts

**Only users with a security level of Administrator can modify existing user accounts.**

1 From the `::user=>` prompt, type the `show` command then press **ENTER**.

2 Note the index number of the user you want to modify.

3 From the `::user=>` prompt, type the `set` command in the following format then press **ENTER**.

**set** <index> <security level> <access method>

### Parameters

`<index>`

The index number of the user you want to modify.

`<security level>`

The access level for the account. Choose one of the following.

| Security Level | Abbreviation | View Information | Configure All Information Except User Accounts | Configure User Accounts |
|---|---|---|---|---|
| Monitoring | Mon | Yes | No | No |
| Provisioning | Pro | Yes | Yes | No |
| Administrator | Admin | Yes | Yes | Yes |

`<access method>`

The method(s) by which the user is allowed to access the command line interface. For multiple access methods, list the letter for each. Options:

- **T** allows access through a Telnet session
- **C** allows access through a serial craft port connection
- **W** allows access through a Web connection
- **F** allows access through an FTP site

### Example

```
::user=> set 3 pro tcw
```

## Deleting User Accounts

**Only users with a security level of Administrator can delete user accounts. The admin user account cannot be deleted.**

1. From the `::user=>` prompt, type the `show` command then press **ENTER**.
2. Note the index number of the user you want to delete.
3. From the `::user=>` prompt, type the `delete` command in the following format then press **ENTER**.

   ```
   delete <index>
   ```

   A confirmation prompt displays.
4. Do one of the following:
   - To delete the user, type **Y** then press **ENTER**.
   - To cancel the action, type **N** then press **ENTER**.

### Parameter

`<index>`

The index number of the user you want to delete.

### Example

```
::user=> delete 2
```

## Changing a User Password

The password command changes the login password for the current user. No user can change the password for another user.

**1** From the `::user=>` prompt, type the `show` command then press **ENTER**.

**`password`**

**2** At the prompt, type the current password then press **ENTER**.

**3** At the prompt, type the new password then press **ENTER**.

The password must be between 4 and 16 alphanumeric characters and the first character must be a letter. The password cannot contain spaces, but can contain multiple words separated by and underscore.

**4** At the prompt, retype the new password then press **ENTER**.

# DISPLAYING SYSTEM INVENTORY

You can display the card description, serial number, hardware version, firmware version and software version for each card installed in the system.

**1** From the `::root=>` prompt, type the following command then press **ENTER** to display the `:: hardware=>` prompt.

**`display hardware`**

**2** Type the cards command in the following format then press **ENTER**.

**cards** [<slot number>]

### Parameter

[<slot number>]

Specifies a particular slot for which to display an inventory. Omitting this parameter displays information about all cards installed in the system.

### Examples

:: hardware=> **cards 4**

:: hardware=> **cards**

The following screen illustrates an example of both display cards commands.

```
::hardware=> cards

                              Serial      Hardware  Firmware   Software
Slot Description              Number      Revision  Revision   Revision

1    management               DMU_0001      0         n/a      x.1021
3    12 port,ADSL/DMT/CELL    FDAP980902   v2.3.4     v2.1.2   x.1021
12   OC-3/ATM/LINE            12345678      1.0        1.0     x.1021

::hardware=> cards 3
                              Serial      Hardware  Firmware   Software
Slot Description              Number      Revision  Revision   Revision

3    12 port,ADSL/DMT/CELL    FDAP980902   v2.3.4     v2.1.2   x.1021
```

# VIEWING SDSL FRAME CPE GENERAL INFORMATION

You can view the software version number for each modem that is attached to an SDSL frame port.

You view SDSL frame CPE general information using the command-line interface from the `::frame=>` prompt. From the `::root=>` prompt, type the following command then press **ENTER** to display the `::frame=>` prompt.

**`display stats sdsl frame`**

Type the modem command as follows, then press **ENTER**.

**`modem`** `[<port>]`

### Parameter

`[<port>]`

The port for which you want to view CPE statistics. Omitting this parameter displays CPE statistics for all SDSL frame ports.

### Examples

`::frame=>` **`modem`**

`::frame=>` **`modem 3.2`**

A screen similar to the following displays.

```
::frame=>
       SDSL Modem (CPE)
Port                 Version
4.1                     0
4.2                    24
4.3                     0
4.4                     0
4.5                    24
```

| Information | Description |
|---|---|
| Port | The SDSL frame port to which the modem is attached. |
| VerNo | The SDSL frame modem software version number. |

# REBOOTING CARDS

You can reboot an individual card, or the entire Avidia system, two different ways:

- Perform a cold boot by recycling power to the system. This reinitializes the card memory, including resetting the system log. If you do not want to lose the data stored in the system log, do not perform a cold boot.
- Perform a warm boot as described in the following sections. The data stored in the system log is retained.

You can reboot cards from the `::admin=>` prompt. From the `::root=>` prompt, type **`admin`** then press **ENTER** to display the `::admin=>` prompt.

## Rebooting the System

1. To reboot the entire system, from the `::admin=>` prompt type the reboot command in the following format then press **ENTER**.

   **`reboot [-y]`**

   The system displays:

   `Reboot System?`

2. Type **Y** to reboot the system, or type **N** to cancel this procedure.

### Rebooting an Individual Card

To reboot an individual card, from the `::admin` prompt type the reboot command in the following format then press **ENTER**.

**`reboot`** `<slot> [`**`-y`**`]`

#### Parameter

`<slot>`

The slot in which the card you want to reboot is installed.

`<`**`-y`**`>`

Results in the specified card rebooting without first displaying a confirmation message. If you omit this parameter, a confirmation message displays. Type **Y** to reboot the card or type **N** to cancel the command.

#### Example

`::admin=>` **`reboot 4`**

## SETTING THE COMMAND-LINE INTERFACE TIMEOUT OPTION

You can specify the length of time after which the command-line interface automatically logs the current user off if no keyboard input is received. You set the command-line interface timeout option from the `::admin=>` prompt. From the `::root=>` prompt, type **`admin`** then press **ENTER** to display the `::admin=>` prompt.

From the `::admin=>` prompt, type the timeout command in the following format then press **ENTER**.

**`timeout`** `[<minutes>]`

### Parameter

`<minutes>`

Specifies the number of minutes after which, if no keyboard input is received, the command-line interface automatically logs the current user off the command-line interface. The maximum timeout value is 2146483647. Omitting this parameter displays the current timeout value.

### Example

`:: admin=>` **`timeout 15`**

# DELETING FILES

You can delete any file from any card. You delete files from the `::admin=>` prompt. From the `::root=>` prompt, type **`admin`** then press **ENTER** to display the `::admin=>` prompt.

From the `::admin=>` prompt, type the delete command in the following format then press **ENTER**.

**`delete`** `<slot> <file name>`

### Parameter

`<slot>`

Specifies the slot in which the file you want to delete is stored.

`<file name>`

The complete file name, including file name extension, of the file you want to delete.

### Example

`:: admin=>` **`delete 1 pguser.cnf`**

# PART III

## THE AVIDIA WEB INTERFACE

This section contains the following chapters, which explain how to manage an Avidia system using the Avidia Web interface:

# INTRODUCTION TO THE WEB INTERFACE 18

The Avidia Web interface provides Avidia system management, including configuration, performance monitoring, and system maintenance and administration. The Web interface comes preinstalled on the Avidia management card built-in Web server. You access the Web interface using a Web browser, either over a network or using a PC connected directly to the Fast Ethernet port on the back of the Avidia system.

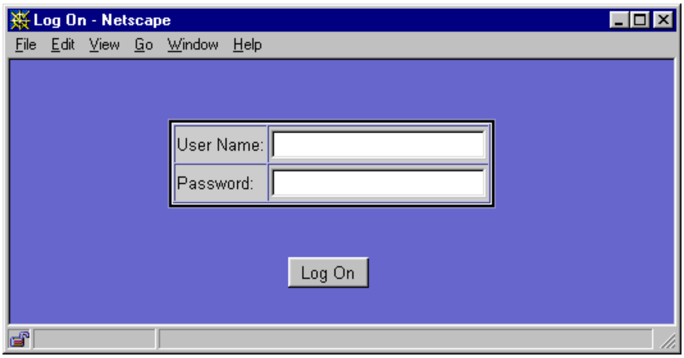
This chapter provides an introduction to the Web interface, including:

# LOGGING ON TO THE WEB INTERFACE

Open your Web browser, type the Avidia management card IP address in the address box (format *xxx.xxx.xxx.xxx*), then press **ENTER**. If you have not set the management card IP address, see "Preparing for System Configuration and Management" on page 11 for instructions.

**If you are using your browser to manage a single Avidia system, you may want to set your Web browser Home setting to the management card IP address and set the browser to open the Home page first. This causes the Web interface Log On window to automatically display each time you open your browser.**

The **Log On** window displays.




1. Type your user name in the **User Name** box.

   The user name *admin* is preconfigured for your use.

2. Type your password in the **Password** box.

   The *admin* user name password is *dslam*.

**3** Click **Log On**.

A **Close Window?** dialog displays.

**4** Click **OK** to close the dialog.

The **Site Map Navigation** window displays.

**Multiple users can access the Web interface simultaneously, as all user configurations are stored in a queue and executed in the order in which the Web interface receives them. For example, if user A changes a setting, then user B changes a setting, user A's change will occur first, followed by user B's change.**

**You can open multiple browser windows and log on to a different Avidia system in each window. However, on Windows NT systems, you cannot open multiple windows of the same Web browser — you must use a different Web browser for each system.**

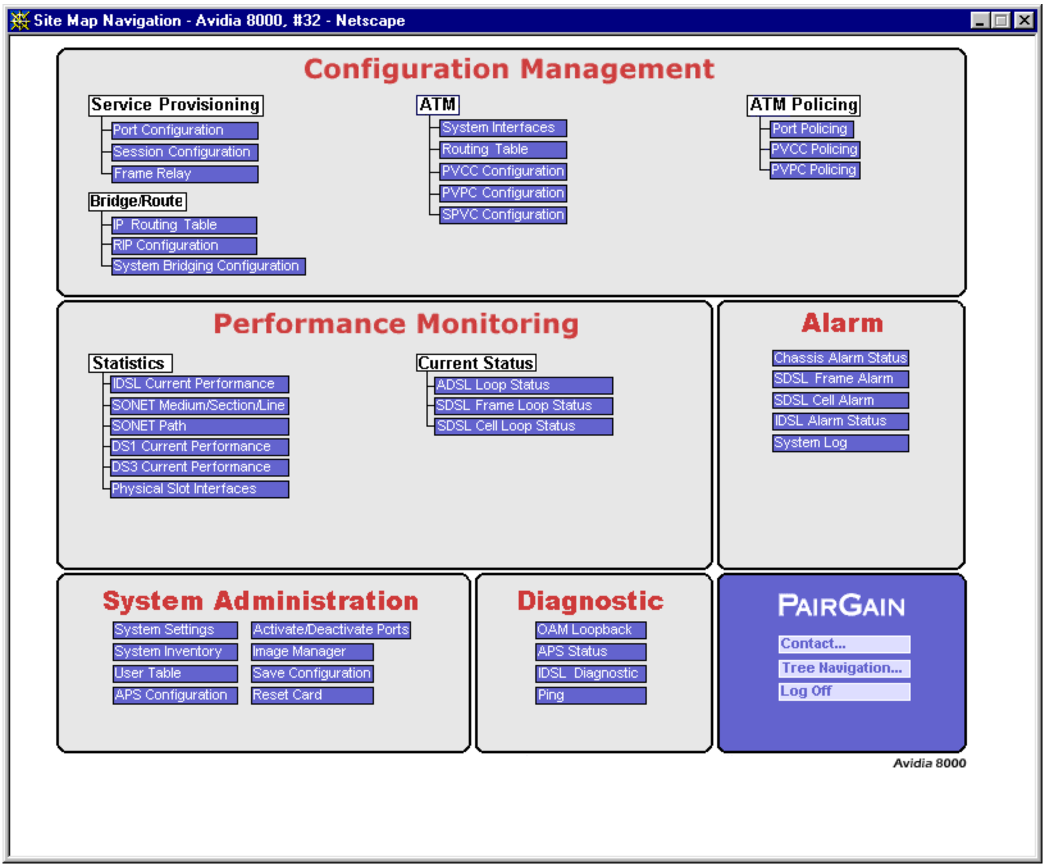
**When the system times out, it logs the current user off, but the displayed screen does not change. The next time you attempt to provide input to the screen, the system displays the Log On window. After logging back on, click Get (if available) or close the window and reopen it to refresh the screen data. Otherwise, the table may display without data, or the table may contain all zeros.**

# NAVIGATING THE WEB INTERFACE

The Web interface provides two different methods of navigation: the **Site Map Navigation** window and the **Tree Navigation** window. The **Site Map Navigation** window is the default window, which displays immediately after you successfully log on to the Web interface. To display the **Tree Navigation** window, click **Tree Navigation** in the **Site Map Navigation** window.

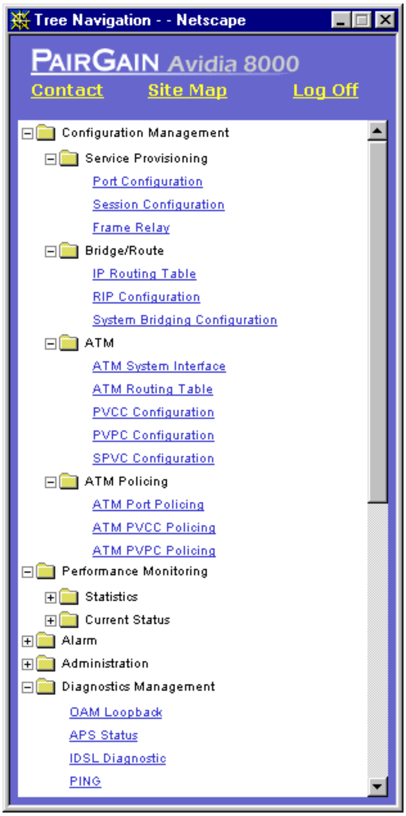
## Site Map Navigation Window

The **Site Map Navigation** window displays all Web interface window names. White boxes indicate window category headings, and are not selectable. Click any blue window name to open that window.



## Tree Navigation Window

The **Tree Navigation** window contains five primary folders, from which a hierarchy of folders and windows stem. Click a folder to display its subfolders. Selectable windows are underlined in blue. Click a window name to open that window.



# WEB INTERFACE CONVENTIONS

Typeface conventions:

- **This font** indicates a reference to an element on the screen.
- *Italic* type indicates the format in which you type the information specified in the procedure.

# GETTING HELP

Each Web interface window contains a  button, which links to the topic in the online Help system that corresponds to that window. In addition, the Help system provides a standard Contents list and Index to help you locate other Help topics of interest.

# LOGGING OFF THE WEB INTERFACE

1 In either the **Site Map** or **Tree** navigation window, click **Log Off**.

  A confirmation dialog displays.

2 Do one of the following:

  - Click **Yes** to log off.
  - Click **No** to return to the navigation window.

# CONFIGURING SYSTEM PARAMETERS 19

This chapter describes how to configure system parameters, such as system identifiers and management card IP addresses.

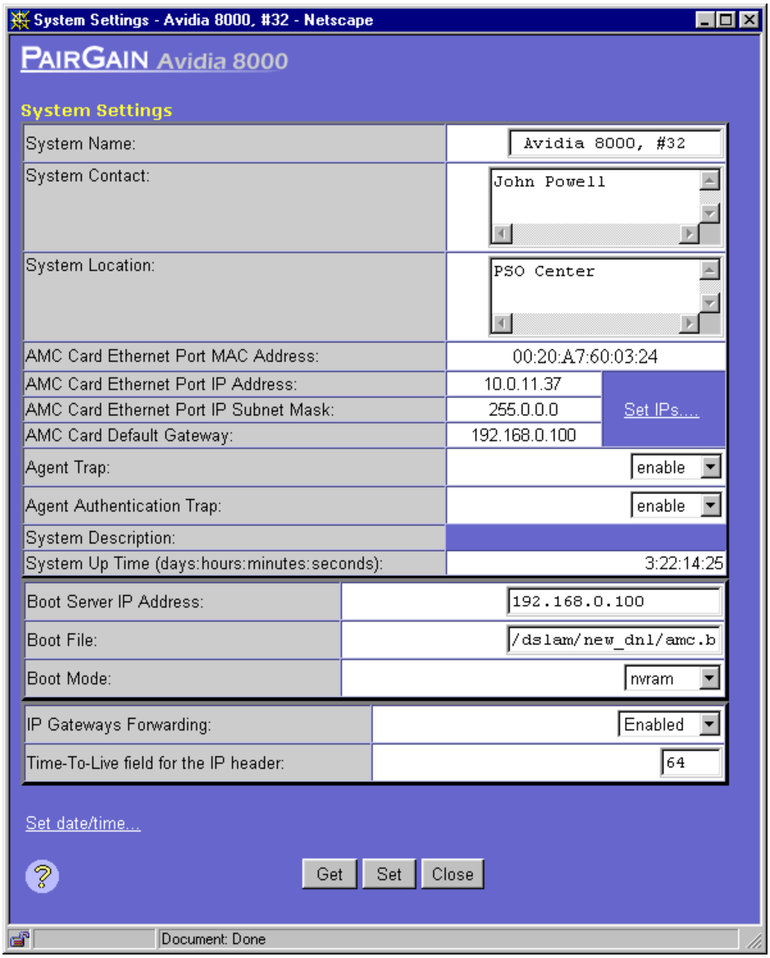
# OPENING THE SYSTEM SETTINGS WINDOW

You configure system parameters from the **System Settings** window. Do one of the following:

- In the **Site Map Navigation** window, click **System Settings**.
- In the **Tree Navigation** window, click **Administration**, **System Settings**.

The **System Settings** window opens, with the following read-only information displayed:

| Information | Description |
|---|---|
| AMC Card Ethernet Port MAC Address | The management card Ethernet port MAC address in hexadecimal format. |
| AMC Card Ethernet Port IP Address | The management card Ethernet port IP address. |
| AMC Card Ethernet Port Subnet Mask | The management card Ethernet port subnet mask. |
| AMC Card Ethernet Port Default Gateway | The management card Ethernet port default gateway IP address. |
| System Description | A text string that identifies the system hardware and software. This description is obtained from the management unit. |
| System Up Time | The length of time the system has been up since it was last reset, in *days:hours:minutes:seconds* format. |


System Settings - Avidia 8000, #32 - Netscape
PAIRGAIN Avidia 8000
System Settings
System Name:
Avidia 8000, #32
System Contact:
John Powell
System Location:
PSO Center
AMC Card Ethernet Port MAC Address:
00:20:A7:60:03:24
AMC Card Ethernet Port IP Address:
10.0.11.37
AMC Card Ethernet Port IP Subnet Mask:
255.0.0.0
AMC Card Default Gateway:
192.168.0.100
Set IPs....
Agent Trap:
enable
Agent Authentication Trap:
enable
System Description:
System Up Time (days:hours:minutes:seconds):
3:22:14:25
Boot Server IP Address:
192.168.0.100
Boot File:
/dslam/new_dnl/amc.b
Boot Mode:
nvram
IP Gateways Forwarding:
Enabled
Time-To-Live field for the IP header:
64
Set date/time...
Get
Set
Close
Document: Done

# Configuring System Identification

To facilitate network management, you should assign a name to the system, identify who to contact regarding the system, and specify the system location. You use text strings to specify this information.

**1** In the **System Settings** window **System Name** box, type a text string to identify the system.

The text string can contain any keyboard characters other than quotation marks and can be any length.

**2** In the **System Contact** box, type a text string to identify the system contact.

The text string can contain any keyboard characters and can be any length.

**3** In the **System Location** box, type a text string to identify the system location.

The text string can contain any keyboard characters and can be any length.

**4** Do one of the following:

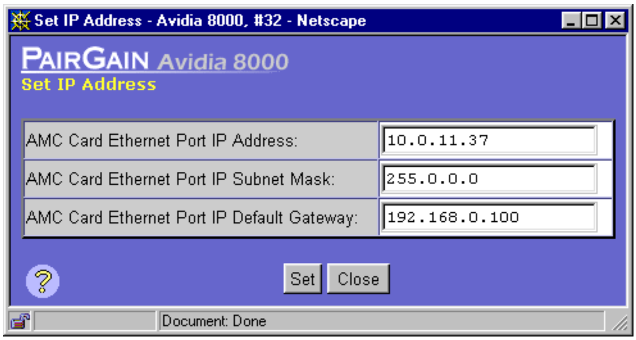
- To activate the new settings, click **Set**.
- To cancel the new settings, click **Get**. You can only cancel the new settings if you have not yet clicked **Set**.

# CONFIGURING MANAGEMENT CARD IP ADDRESSES

You set the management card IP address, subnet mask and default gateway (if one exists) to enable communication with external networks. While you must initially set the IP addresses using the command-line interface, you can change this information using the Web interface. All IP addresses use the format *xxx.xxx.xxx.xxx*.

**1** In the **System Settings** window, click **Set IPs**.

The **Set IP Address** window displays.




**2** In the **AMC Card Ethernet Port IP Address** box, type the IP address of the management card Ethernet port.

The default management card IP address is 192.168.0.1.

**You cannot use IP addresses 192.168.1.0 through 192.168.21.255 with subnet mask 255.255.255.0, as these addresses are restricted for internal Avidia system use.**

**3** In the **AMC Card Ethernet Port IP Subnet Mask** box, type the IP subnet mask of the management card Ethernet port.

**4** In the **AMC Card Ethernet Port IP Default Gateway** box, type the management card default gateway (router) IP address, if one exists.

A gateway is a router on the network through which the Avidia system can communicate with external networks. The default gateway default IP address is 192.168.0.100.

**5** To activate the new default gateway IP address, click **Set**, otherwise click **Close**.

# Configuring System Trap Generation Status

Traps are messages sent from the management card regarding system events, such as alarms. The Avidia system distinguishes between two types of traps. Agent authentication traps are generated when the system receives an invalid SNMP community string. (See “Configuring Community Strings” on page 97 for more information on community strings.) General traps are generated in response to system events such as alarms and configuration changes. You must specify whether or not you want the system to generate each type of trap.

1. In the **System Settings** window **Agent Trap** box, select **enable** or **disable** to enable or disable all trap generation other than the agent authentication trap.
2. In the **Agent Authentication Trap** box, select **enable** or **disable** to enable or disable agent authentication error trap generation.
3. Do one of the following:
   - To activate the new settings, click **Set**.
   - To cancel the new settings, click **Get**. You can only cancel the new settings if you have not yet clicked **Set**.

# Configuring Boot File Information

You must specify the location from which to boot the management card image file. For an explanation of Avidia image files, see “Avidia System File Management” on page 8.

1. In the **System Settings** window **Boot Mode** box, do one of the following:
   - Click **nvram** to set the boot location to management card NVRAM.
   - Click **network** to set the boot location to an external TFTP server using TFTP protocol.

**2** If the **Boot Mode** is set to **network:**

**a** In the **Boot Server IP Address** box, type the IP address of the TFTP server on which the image file you want to boot is stored (format *xxx.xxx.xxx.xxx*).

**b** In the **Boot File** box type the complete path and file name, including file name extension, of the image file you want the management card to boot.

The management card image file name is amc.bin. If the image file is stored in a directory other than the TFTP server default directory, you must specify the path. See your TFTP server documentation to determine the required path syntax. If you do not specify the file name, the management card attempts to boot the available image files in the following order:

amc.new—An image file that has been downloaded from a TFTP server but has not yet been booted or validated. Once the file has been validated, the file name extension is automatically changed to .bin.

amc.bin—The image file that came preinstalled on the management card or an image file that was downloaded from a TFTP server and has been booted and validated by the management card.

amc.alt—A backup image file you can create prior to downloading a new image file.

**3** Do one of the following:

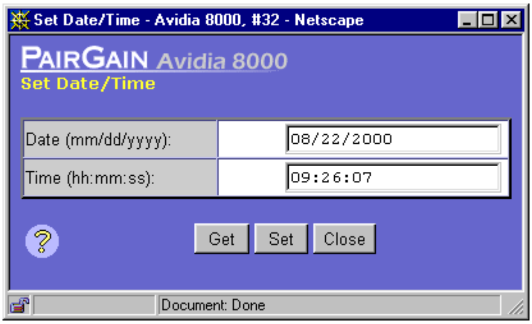
- To activate the new settings, click **Set**.
- To cancel the new settings, click **Get**. You can only cancel the new settings if you have not yet clicked **Set**.

# CONFIGURING SYSTEM DATE AND TIME

It is important to set the system date and time so the alarms and events logs reflect the actual time each event occurred.

**1** In the **System Settings** window, click **Set date/time**.

The **Set Date/Time** window displays.




**2** In the **Date** box, type the current date in *mm/dd/yyyy* format.

**3** In the **Time** box, type the current time in *hh:mm:ss* two-digit 24-hour format.

For example, 2 a.m. is represented 02:00:00 and 2 p.m. is represented 14:00:00.

**4** Do one of the following:

- To activate the new settings, click **Set**.
- To cancel the new settings, click **Get**. You can only cancel the new settings if you have not yet clicked **Set**.

# CONFIGURING SUBSCRIBER SERVICES 20

This chapter describes how to configure service for ADSL, SDSL and IDSL lines.

# CONFIGURING ADSL LINE PROFILES

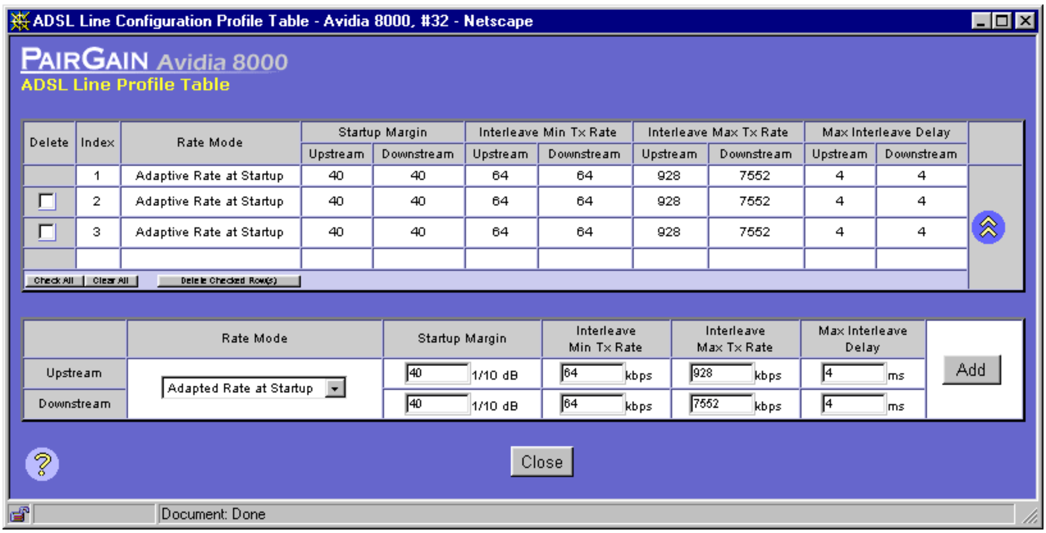
ADSL line profiles contain a preconfigured set of parameters, including the transmit rate, rate adaptation mode, target margin and interleave depth. You assign line profiles to ADSL ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile.

To configure the ADSL line profile:

1 Open the **ADSL Port Configuration** window (see "Configuring ADSL Service" on page 391).

2 Click the **Line Profile Browse** button.

The **ADSL Line Profile Table** window displays the configured ADSL line profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.



## Adding ADSL Line Profiles

You add ADSL line profiles from the **ADSL Line Profile Table** window.

**1** In the **Rate Mode** box, select the desired rate mode (**Fixed Rate** or **Adapted Rate at Startup**).

The rate mode defines the form of transmit rate adaptation. **Fixed Rate** means the loop must be able to come up at the specified maximum transmit rate (Step 4), or it does not come up at all. **Adapted Rate at Startup** means the loop will come up at the highest achievable rate that is greater than the specified minimum transmit rate (Step 3) but less than the specified maximum transmit rate (Step 4).

**2** In the **Upstream** and **Downstream Target Margin** boxes, type the target signal-to-noise margin.

This is the noise margin, in decibels/10, that the modem must achieve with a BER of $10^{-7}$ or better to successfully complete initialization. The typical value for the target margin is 60. A lower target margin may achieve a higher data rate, but increases noise on the line.

**3** If you set the **Rate Mode** to **Adapted Rate at Startup**, in the **Upstream** and **Downstream Interleave Min Tx Rate** boxes, type the minimum transmit rate for interleave channels in kbps. Otherwise, skip this step.

This is the guaranteed minimum transmission rate for all lines to which this profile is applied.

**4** In the **Upstream** and **Downstream Interleave Max Tx Rate** boxes, type the maximum transmit rate for interleave channels in kbps.

This is the highest transmission rate to which the modem can adapt for all lines to which this profile is applied.

**5** In the **Upstream** and **Downstream Max Interleave Depth** boxes, type the interleave depth in milliseconds.

The interleave depth specifies the delay between consecutive bytes. Larger delays result in improved noise immunity, but increase transmission delay. A depth of 16 milliseconds is ideal for maximum noise immunity. However, a depth of 4 to 6 milliseconds is recommended to achieve maximum transmission speeds.

**6** Click **Add** to add the ADSL line profile.

### Deleting ADSL Line Profiles

**You cannot delete profiles that are assigned to ports. You cannot delete the default profile.**

1 In the **ADSL Line Profile Table** window, locate the table row that contains the ADSL line configuration profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

2 Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

3 Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

4 Click **OK** to delete the selected table rows, otherwise click **Cancel**.

## CONFIGURING ADSL ALARM PROFILES

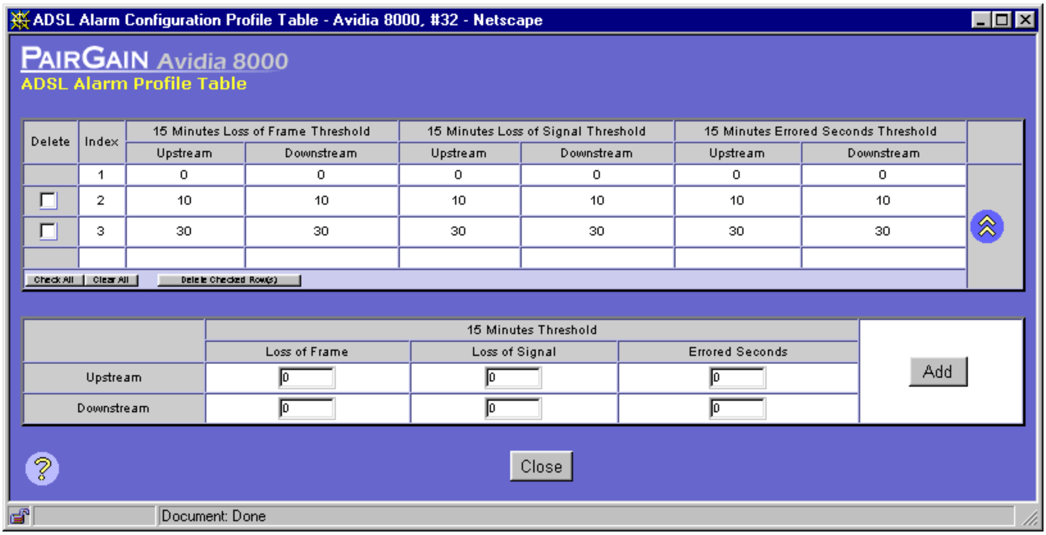
ADSL alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). Only one trap is sent for each 15-minute data collection period. You assign alarm profiles to ADSL ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile.

To configure an ADSL alarm profile:

1 Open the **ADSL Port Configuration** window (see "Configuring ADSL Service" on page 391).

2 Click the **Alarm Profile Browse** button.

The **ADSL Alarm Profile Table** window displays the configured ADSL alarm profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.




## Adding ADSL Alarm Profiles

You add ADSL Alarm profiles from the **ADSL Alarm Profile Table** window.

1 In the **Upstream** and **Downstream 15 Minutes Threshold Loss of Frame** boxes, type a value for this threshold, or type **0** to disable the trap.

   The loss of frame threshold determines the acceptable number of seconds in a 15-minute ADSL performance data collection period during which the frames lose sync on the ADSL interface. In a normal environment with sufficient margin, a typical loss of frame threshold value is 10.

2 In the **Upstream** and **Downstream 15 Minutes Threshold Loss of Signal** boxes, type a value for this threshold, or type **0** to disable this trap.

   The loss of signal threshold determines the acceptable number of seconds in a 15-minute ADSL performance data collection period during which the line power falls below the target margin threshold. In a normal environment with sufficient margin, a typical loss of signal threshold value is 10.

**3** In the **Upstream** and **Downstream 15 Minutes Threshold Errored Seconds** boxes, type a value for this threshold, or type **0** to disable the trap.

The errored seconds threshold determines the acceptable number of seconds during which errors occur on the ADSL interface that prevent the payload from being corrected. In a normal environment with sufficient margin, a typical errored seconds threshold value is 10.

**4** Click **Add** to add the ADSL alarm profile.

## Deleting ADSL Alarm Profiles

**You cannot delete profiles that are assigned to ports.**

**1** In the **ADSL Alarm Profile Table** window, locate the table row that contains the ADSL alarm configuration profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

**3** Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

**4** Click **OK** to delete the selected table rows, otherwise click **Cancel**.

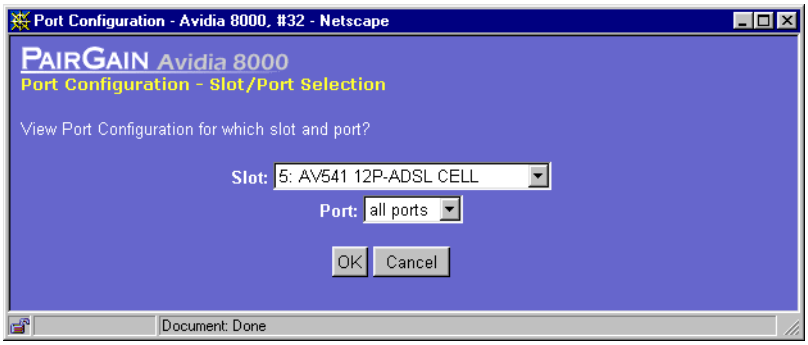
# CONFIGURING ADSL SERVICE

You configure ADSL service for each port by specifying a line profile and an alarm profile. Each ADSL port is assigned a default configuration. The default profile index for each ADSL profile type is 1. This procedure describes how to modify the configuration to reflect the desired service.

**1** Do one of the following:

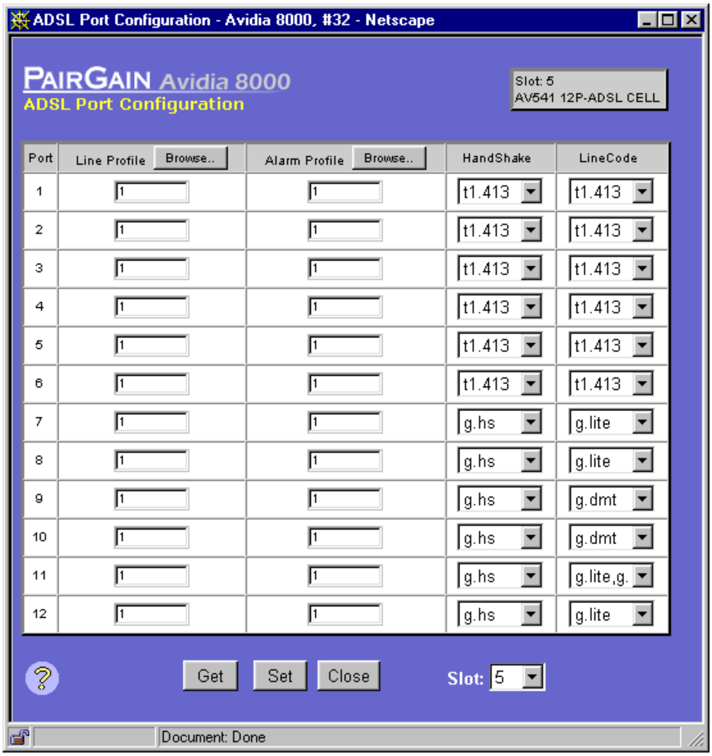
- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.

The **Port Configuration - Slot/Port Selection** window displays.




**2** Select the slot that contains the port you want to configure, then click **OK**.

The **ADSL Port Configuration** window displays. The selected slot displays in the upper right corner of the window, along with the description of the installed card.




**3** In the **Line Profile** boxes, type the desired line profile index for each port you want to configure.

Click the **Line Profile Browse** button to display the configured profiles. If the desired profile is not yet configured, you can configure it now. See "Configuring ADSL Line Profiles" on page 386 for instructions.

**4** In the **Alarm Profile** boxes, type the desired alarm profile index for each port you want to configure.

Click the **Alarm Profile Browse** button to display the configured profiles. If the desired profile is not yet configured, you can configure it now. See "Configuring ADSL Alarm Profiles" on page 388 for instructions.

**5** In the **Handshake** column set the handshaking, either **t1.413** or **g.hs**.

6 If handshaking is set to **g.hs**, use the **LineCode** column to set the line code, either **g.lite** or **g.dmt**.

7 Do one of the following:

- Click **Set** to activate the new settings.
- Click **Get** to cancel the new settings. You can only cancel the settings if you have not clicked **Set**.
- In the **Slot** box select the slot number to configure ports on another card.

# CONFIGURING SDSL FRAME LINE PROFILES

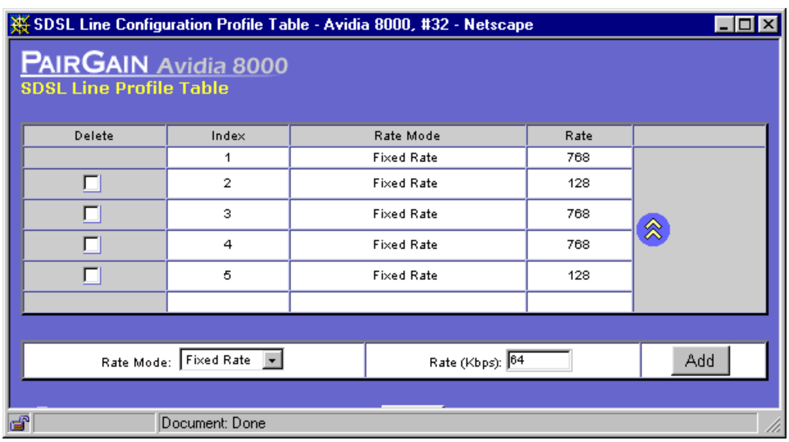
SDSL line profiles contain a preconfigured set of parameters, which include the rate adaptation mode and transmit rate. You assign SDSL line profiles to ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile.

To configure an SDSL line profile:

1 Open the **SDSL Port Configuration** window (see “Configuring SDSL Frame Service” on page 397).

2 Click the **Line Profile Browse** button.

The **SDSL Line Profile Table** window displays the configured SDSL line profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.



## Adding SDSL Frame Line Profiles

**Fixed Rate** is the only supported **Rate Mode**, therefore you do not need to select a **Rate Mode** setting.

**1** In the **Rate (Kbps)** box, type the transmit rate in Kbps.

The valid range supported by the SDSL card is from 64 to 2,048, in increments of 64. However, the specified rate must be supported by the remote modem. See the remote modem documentation to verify the supported data rates.

**2** Click **Add** to add the SDSL line profile.

## Deleting SDSL Frame Line Profiles

**You cannot delete profiles that are assigned to ports.**

**1** In the **SDSL Line Profile Table** window, locate the table row that contains the SDSL line profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

**3** Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

**4** Click **OK** to delete the selected table rows, otherwise click **Cancel**.

# Configuring SDSL Frame Alarm Profiles

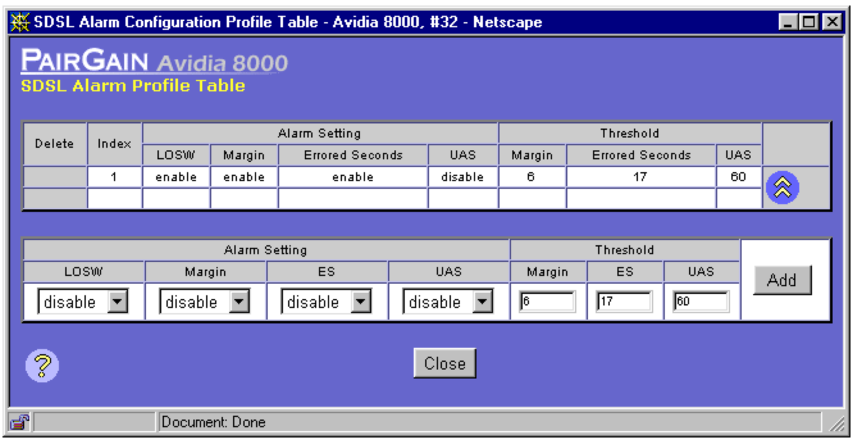
SDSL alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). Only one trap is sent for each 15-minute data collection period. You assign SDSL alarm profiles to ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile.

To configure an SDSL alarm profile:

1 Open the **SDSL Port Configuration** window (see “Configuring SDSL Frame Service” on page 397).

2 Click the **Alarm Profile Browse** button.

The **SDSL Alarm Profile Table** window displays the configured SDSL alarm profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.




## Adding SDSL Frame Alarm Profiles

1 In the **Alarm Setting LOSW** box, select the desired Loss of Sync Word alarm setting (**disable**, **enable**).

A Loss of Sync Word alarm occurs when one of the SDSL loops is out of sync.

2 In the **Alarm Setting Margin** box, select the desired margin alarm setting (**disable**, **enable**).

3 In the **Alarm Setting ES** box, select the desired errored seconds alarm setting (**disable**, **enable**).

4. In the **Alarm Setting UAS** box, select the desired unavailable seconds alarm setting (**disable**, **enable**).
5. In the **Threshold Margin** box, type the desired margin threshold, in decibels.

   When the margin falls below the specified threshold, the margin alarm is activated. A typical margin threshold value is 6.
6. In the **Threshold ES** box, type the desired errored seconds threshold.

   When the number of errored seconds in the current 15-minute data collection interval exceeds the specified threshold, the errored seconds alarm is activated. Errored seconds are seconds during which errors occur that prevent the payload from being corrected. A typical errored second threshold value is 17.
7. In the **Threshold UAS** box, type the desired unavailable seconds threshold.

   When the number of unavailable seconds in the current 15-minute data collection interval exceeds the specified threshold, the UAS alarm is activated. Unavailable seconds are seconds during which the SDSL loop is not synchronized. A typical unavailable seconds threshold value is 60.
8. Click **Add** to add the SDSL alarm profile.

## Deleting SDSL Frame Alarm Profiles

**You cannot delete profiles that are assigned to ports.**

1. In the **SDSL Alarm Profile Table** window, locate the table row that contains the SDSL alarm profile you want to delete.

   Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.
2. Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

   If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

3 Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

4 Click **OK** to delete the selected table rows, otherwise click **Cancel**.

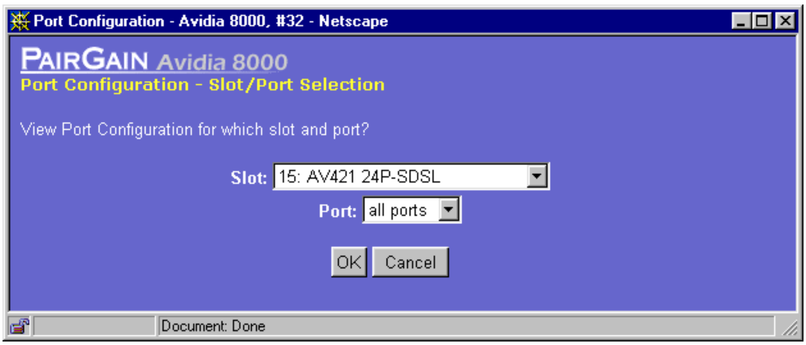
# CONFIGURING SDSL FRAME SERVICE

You configure SDSL service for each port by specifying a line profile and an alarm profile. Each SDSL port is assigned a default configuration. The default profile index for each SDSL profile type is 1. This procedure describes how to modify the configuration to reflect the desired service.

1 Do one of the following:

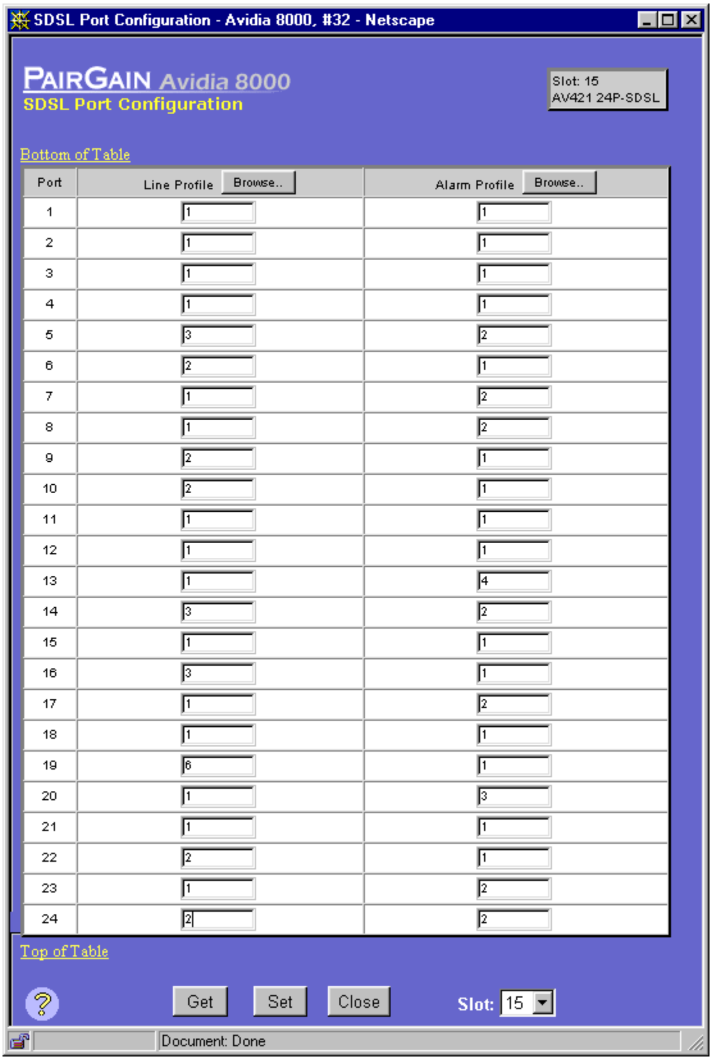
- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.

The **Port Configuration - Slot/Port Selection** window displays.




2 Select the slot you want to configure, then click **OK**.

The **SDSL Port Configuration** window displays. The selected slot displays in the upper right corner of the window, along with the description of the installed card.




**3** In the **Line Profile** boxes, type the desired line profile index for each port you want to configure.

Click the **Line Profile Browse** button to display the configured profiles. If the desired profile is not yet configured, you can configure it now. See "Configuring SDSL Frame Line Profiles" on page 393 for instructions.

4. In the **Alarm Profile** boxes, type the desired alarm profile index for each port you want to configure.

   Click the **Alarm Profile Browse** button display the configured profiles. If the desired profile is not yet configured, you can configure it now. See “Configuring SDSL Frame Alarm Profiles” on page 395 for instructions.

5. Do one of the following:

   - Click **Set** to activate the new settings.
   - Click **Get** to cancel the new settings. You can only cancel the settings if you have not clicked **Set**.
   - In the **Slot** box select the slot number to configure ports on another card.

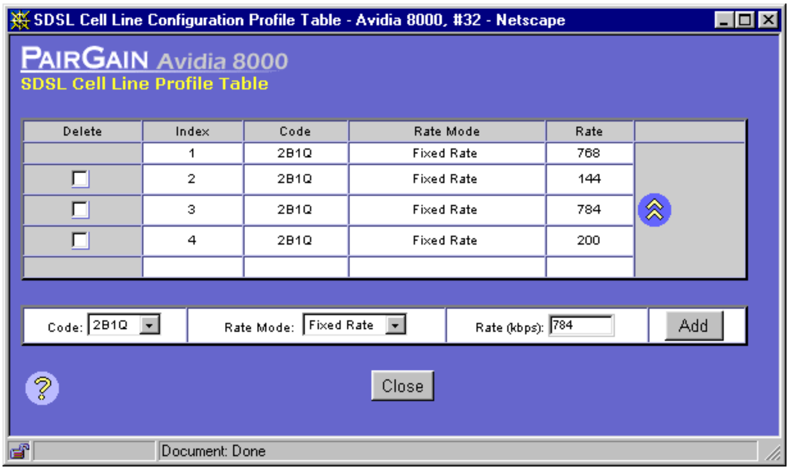
# CONFIGURING SDSL CELL LINE PROFILES

SDSL cell line profiles contain a preconfigured set of parameters, including the rate adaptation mode and the transmit rate. You assign line profiles to SDSL ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile.

To configure the SDSL cell line profile:

1. Open the **SDSL Cell Port Configuration** window (see “Configuring SDSL Cell Service” on page 404).
2. Click the **Line Profile Browse** button.

The **SDSL Cell Line Profile Table** window displays the configured SDSL cell line profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.




## Adding SDSL Cell Line Profiles

You add SDSL cell line profiles from the **SDSL Cell Line Profile Table** window.

**1** In the **Code** box, select the line coding.

The line code sets the line coding for the port. Currently, **2B1Q** is the only supported line coding. **2B1Q** SDSL cell technology provides the equivalent of 1.544 Mbps digital transmission rates, plus signaling over two copper pairs.

**2** In the **Rate Mode** box, select the desired rate mode.

The rate mode defines the form of transmit rate adaptation. Currently **Fixed Rate** is the only supported rate mode. **Fixed Rate** means the loop must be able to come up at the specified maximum transmit rate (Step 3), or it does not come up at all.

**3** In the **Rate** box, enter the desired transmit rate, in kbps.

The valid range supported by the SDSL cell card is from 64 to 2,048, in increments of 64. However, the specified rate must be supported by the remote modem. See the remote modem documentation to verify the supported data rates.

**4** Click **Add** to add the SDSL cell line profile.

## Deleting SDSL Cell Line Profiles

**You cannot delete profiles that are assigned to ports. You cannot delete the default profile.**

**1** In the **SDSL Cell Line Profile Table** window, locate the table row that contains the SDSL cell line configuration profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

**3** Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

**4** Do one of the following:

- Click **OK** to delete the selected table rows.
- Click **Cancel** to not delete the table rows.

# CONFIGURING SDSL CELL ALARM PROFILES

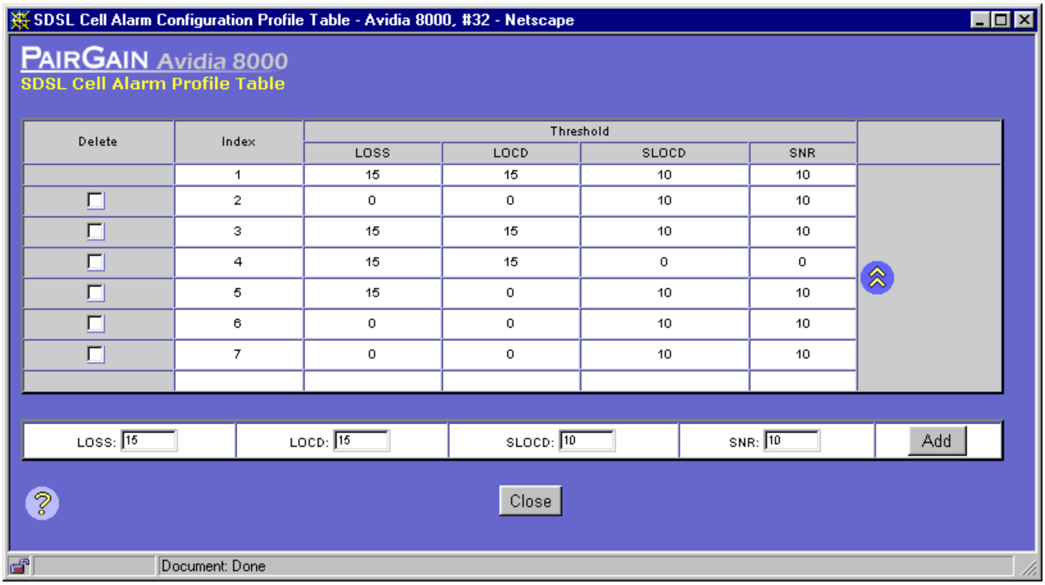
SDSL cell alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). Only one trap is sent for each 15-minute data collection period. You assign alarm profiles to SDSL ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile. Setting the threshold value to zero disables the trap.

To configure an SDSL cell alarm profile:

**1** Open the **SDSL Cell Port Configuration** window (see “Configuring SDSL Cell Service” on page 404).

**2** Click the **Alarm Profile Browse** button.

The **SDSL Cell Alarm Profile Table** window displays the configured SDSL cell alarm profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.




| Delete | Index | Threshold | | | |
|---|---|---|---|---|---|
| | | LOSS | LOCD | SLOCD | SNR |
| | 1 | 15 | 15 | 10 | 10 |
| ☐ | 2 | 0 | 0 | 10 | 10 |
| ☐ | 3 | 15 | 15 | 10 | 10 |
| ☐ | 4 | 15 | 15 | 0 | 0 |
| ☐ | 5 | 15 | 0 | 10 | 10 |
| ☐ | 6 | 0 | 0 | 10 | 10 |
| ☐ | 7 | 0 | 0 | 10 | 10 |

## Adding SDSL Cell Alarm Profiles

You add SDSL cell alarm profiles from the **SDSL Cell Alarm Profile Table** window.

**1** In the **Loss of Cell Delineation** box, type a value for this threshold, or type **0** to disable the trap.

The loss of cell delineation threshold determines the acceptable number of seconds in a 15-minute SDSL cell performance data collection period during which some cells transmitted during that second were lost.

**2** In the **Severe Loss of Cell Delineation** box, type a value for this threshold, or type **0** to disable this trap.

The severe loss of cell delineation threshold determines the acceptable number of seconds in a 15-minute SDSL cell performance data collection period during which the total number of LOCD events in that second exceed 50% of the total bandwidth available during that second.

3 In the **SNR** box, type a value for this threshold, or type **0** to disable the trap.

The signal-to-noise ratio threshold determines how much margin can be dropped before the number of bit errors exceeds the ratio of $1x10^{-7}$ errored bits per bits transmitted.

4 Click **Add** to add the SDSL cell alarm profile.

## Deleting SDSL Cell Alarm Profiles

**You cannot delete profiles that are assigned to ports.**

1 In the **SDSL Cell Alarm Profile Table** window, locate the table row that contains the SDSL cell alarm configuration profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

2 Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

3 Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

4 Do one of the following:

- Click **OK** to delete the selected table rows.
- Click **Cancel** to not delete the table rows.

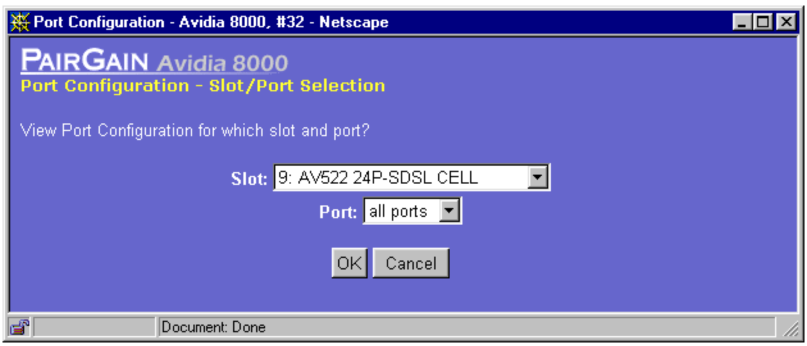
# CONFIGURING SDSL CELL SERVICE

You configure SDSL service for each port by specifying a line profile and an alarm profile. Each SDSL cell port is assigned a default configuration. The default profile index for each SDSL cell profile type is 1. This procedure describes how to modify the configuration to reflect the desired service. Each SDSL cell port is assigned a default configuration. This procedure describes how to modify the configuration to reflect the desired service.

**1** Do one of the following:

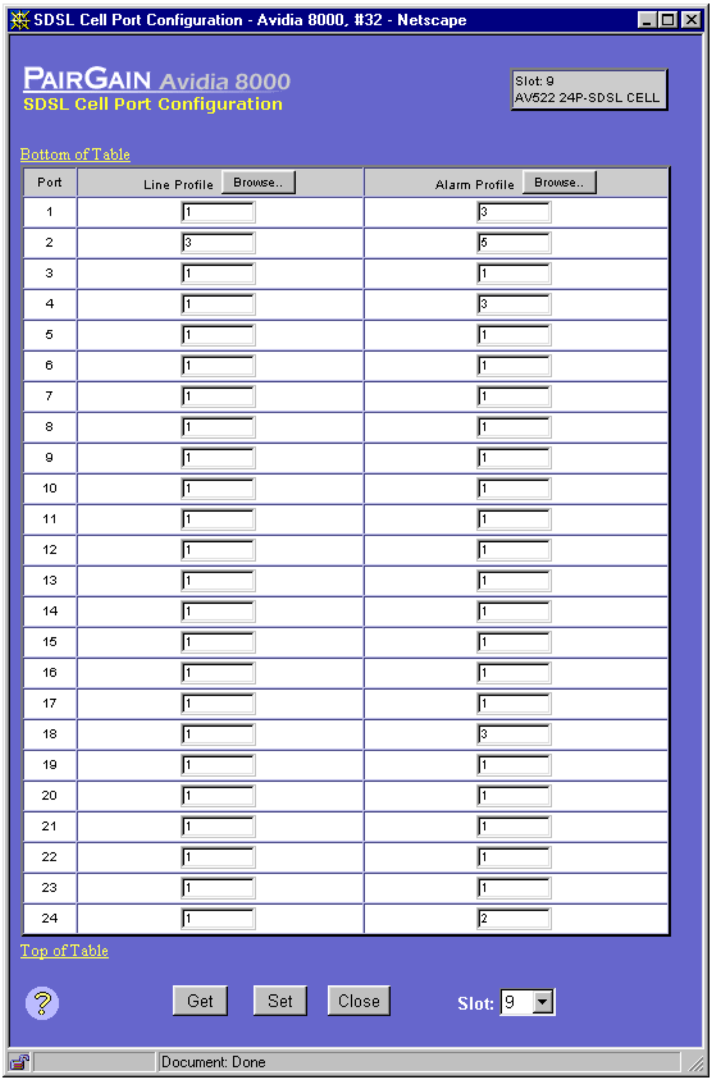
- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.

The **Port Configuration - Slot/Port Selection** window displays.




**2** Select the slot that contains the port you want to configure, then click **OK**.

The **SDSL Cell Port Configuration** window displays. The selected slot displays in the upper right corner of the window, along with the description of the installed card.




3 In the **Line Profile** boxes, type the desired line profile index for each port you want to configure.

Click the **Line Profile Browse** button to display the configured profiles. If the desired profile is not yet configured, you can configure it now. See "Configuring SDSL Cell Line Profiles" on page 399 for instructions.

**4** In the **Alarm Profile** boxes, type the desired alarm profile index for each port you want to configure.

Click the **Alarm Profile Browse** button to display the configured profiles. If the desired profile is not yet configured, you can configure it now. See "Configuring SDSL Cell Alarm Profiles" on page 401 for instructions.

**5** Do one of the following:

- Click **Set** to activate the new settings.
- Click **Get** to cancel the new settings. You can only cancel the settings if you have not clicked **Set**.
- In the **Slot** box select the slot number to configure ports on another card.

# CONFIGURING IDSL LINE PROFILES

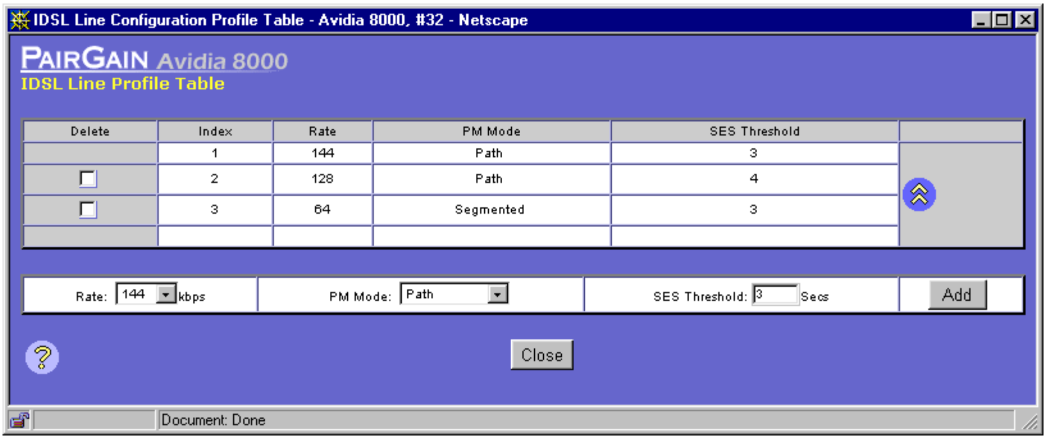
IDSL line profiles contain a preconfigured set of parameters, including the transmit rate, performance monitoring mode, and SES (severely errored second) threshold. You assign line profiles to IDSL ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile.

To configure an IDSL line profile:

**1** Open the **IDSL Port Configuration** window (see "Configuring IDSL Service" on page 411).

**2** Click the **Line Profile Browse** button.

The **IDSL Line Profile Table** window displays the configured IDSL line profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.




## Adding IDSL Line Profiles

You add IDSL line profiles from the **IDSL Line Configuration Profile Table** window.

**1** In the **Rate** box, select the desired transmission rate on the link in kbps (**64**, **128**, or **144**).

**2** In the **Performance Monitor** box, select the mode (**Path** or **Segmented**).

The mode determines how IDSL current performance data (see “Monitoring IDSL Performance” on page 515) and diagnostic data (see “Managing IDSL Diagnostics” on page 568) are collected.

- In **Path** mode, statistics are reported for each segment of the connection path (loop) cumulatively. In the customer direction, node 0 (Avidia system) reports statistics for the first segment, node 1 reports statistics for the first and second segments, etc. In the network direction, node 0 (Avidia system) reports statistics for all the segments, node 1 reports statistics for all but the first segment, etc.

- In **Segmented** mode, statistics are reported for each segment of the connection path (loop). In both the customer and network directions, node 0 (Avidia system) reports statistics for the first segment, node 1 reports statistics for the second segment, etc.

**3** In the **SES Threshold** box, type the severely errored second threshold in seconds.

The SES Threshold is the number of block errors required for defining a severely errored second. The range is 1 to 15, with 3 as the default. A block error is generated any time there is a CRC violation detected on an IDSL superframe.

**4** Click **Add** to add the IDSL line profile.

## Deleting IDSL Line Profiles

**You cannot delete profiles that are assigned to ports. You cannot delete the default profile.**

1 In the **IDSL Line Configuration Profile Table** window, locate the table row that contains the IDSL line configuration profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

2 Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

3 Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

4 Do one of the following:

- Click **OK** to delete the selected table rows.
- Click **Cancel** to not delete the table rows.

# CONFIGURING IDSL ALARM PROFILES

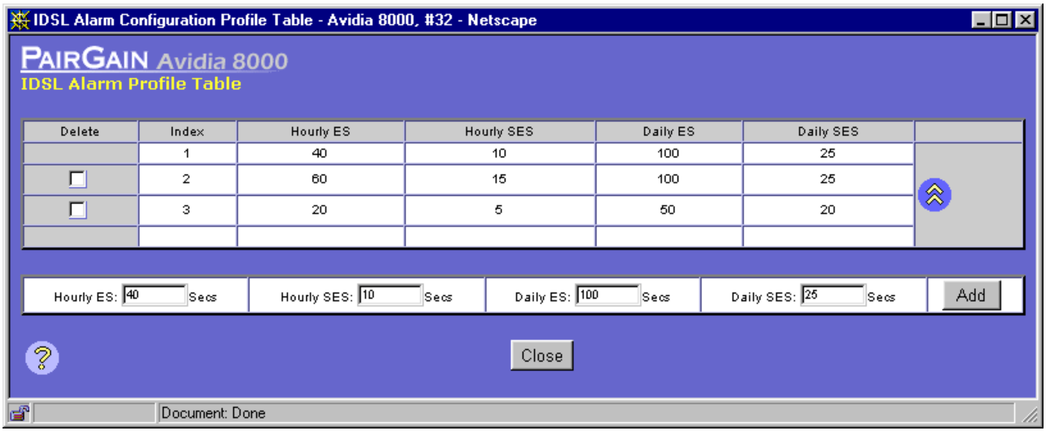
IDSL alarm profiles determine the conditions that generate SNMP traps. When the configured thresholds are met or exceeded, the SNMP agent sends a trap to the configured trap receiver(s). You assign alarm profiles to IDSL ports during port configuration. A default profile exists with an index of 1. You cannot delete the default profile.

To configure an IDSL alarm profile:

1 Access the **IDSL Port Configuration** window (see "Configuring IDSL Service" on page 411).

2 Click the **Alarm Profile Browse** button.

The **IDSL Alarm Profile Table** window displays the configured IDSL alarm profiles. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.




## Adding IDSL Alarm Profiles

You add IDSL Alarm profiles from the **IDSL Alarm Profile Table** window.

1 In the **Hourly ES** box, type the errored second threshold in seconds, or type **0** to disable this trap. The range is 0 to 255, with 40 as the default.

   The Hourly ES Threshold is the number of errored seconds that must be met or exceeded on the IDSL line within an hour for an alarm to display. An errored second generates when one or more block errors (CRC violations) are detected during a one second interval.

2 In the **Hourly SES** box, type the desired severely errored second threshold in seconds, or type **0** to disable this trap. The range is 0 to 127, with 10 as the default.

   The Hourly SES Threshold is the number of severely errored seconds that must be met or exceeded on the IDSL line within an hour for an alarm to display. A severely errored second generates when the number of block errors (CRC violations) defined by the SES threshold parameter (see “Adding ADSL Line Profiles” on page 387) are detected during a one second interval.

3 In the **Daily ES** box, type the desired errored second threshold in seconds, or type **0** to disable this trap. The range is 0 to 4095, with 100 as the default.

   The Daily ES Threshold is the number of errored seconds that must be met or exceeded on the IDSL line within a day for an alarm to display. An errored second generates when one or more block errors (CRC violations) are detected during a one second interval.

4 In the **Daily SES** box, type the desired severely errored second threshold in seconds, or type **0** to disable this trap. The range is 0 to 2047, with 25 as the default.

The Daily SES Threshold is the number of severely errored seconds that must be met or exceeded on the IDSL line within a day for an alarm to display. A severely errored second generates when the number of block errors (CRC violations) defined by the SES threshold parameter (see "Adding ADSL Line Profiles" on page 387) are detected during a one second interval.

5 Click **Add** to add the IDSL alarm profile.

## Deleting IDSL Alarm Profiles

**You cannot delete profiles that are assigned to ports.**

1 In the **IDSL Alarm Configuration Profile Table** window, locate the table row that contains the IDSL alarm configuration profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

2 Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

3 Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

4 Do one of the following:

- Click **OK** to delete the selected table rows.
- Click **Cancel** to not delete the table rows.

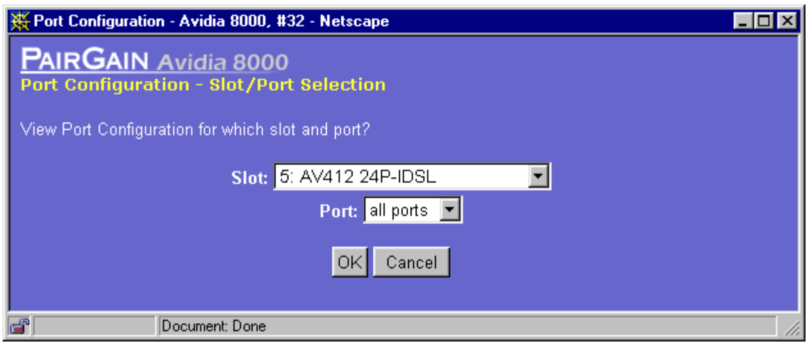
# CONFIGURING IDSL SERVICE

You assign IDSL service for the card by specifying the transmit clock source and for each port by specifying a line profile and alarm profile. Each IDSL port is assigned a default configuration. This procedure describes how to modify the configuration to reflect the desired service.

**1** Do one of the following:

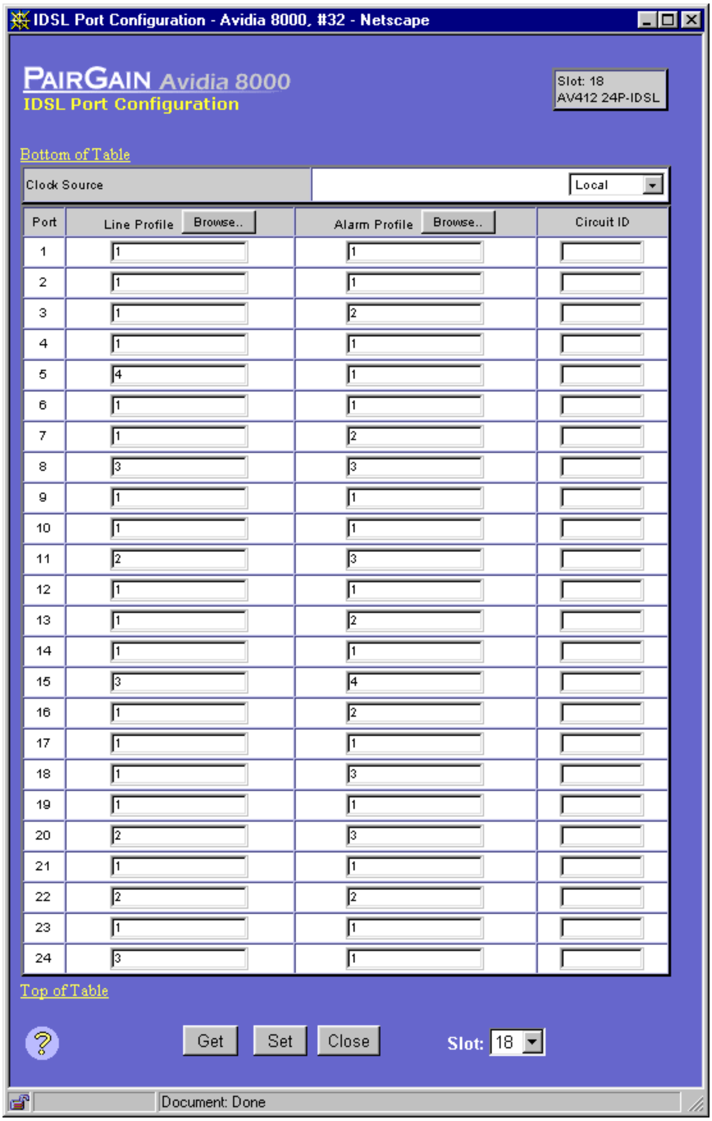
- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.

The **Port Configuration - Slot/Port Selection** window displays.




**2** Select the slot that contains the port you want to configure, then click **OK**.

The **IDSL Port Configuration** window displays. The selected slot displays in the upper right corner of the window, along with the description of the installed card.




| Port | Line Profile | Alarm Profile | Circuit ID |
|---|---|---|---|
| 1 | 1 | 1 | |
| 2 | 1 | 1 | |
| 3 | 1 | 2 | |
| 4 | 1 | 1 | |
| 5 | 4 | 1 | |
| 6 | 1 | 1 | |
| 7 | 1 | 2 | |
| 8 | 3 | 3 | |
| 9 | 1 | 1 | |
| 10 | 1 | 1 | |
| 11 | 2 | 3 | |
| 12 | 1 | 1 | |
| 13 | 1 | 2 | |
| 14 | 1 | 1 | |
| 15 | 3 | 4 | |
| 16 | 1 | 2 | |
| 17 | 1 | 1 | |
| 18 | 1 | 3 | |
| 19 | 1 | 1 | |
| 20 | 2 | 3 | |
| 21 | 1 | 1 | |
| 22 | 2 | 2 | |
| 23 | 1 | 1 | |
| 24 | 3 | 1 | |

3 In the **Clock Source** box, select the transmit clock source for the IDSL card (**Local**, **System A**, or **System B**).

- **Local**—The IDSL card derives timing from the IDSL card clock.
- **System A**—The IDSL card derives timing from the Avidia system reference clock on channel A.
- **System B**—The IDSL card derives timing from the Avidia system reference clock on channel B.

4 In the **Line Profile** boxes, type the desired line profile index for each port you want to configure.

Click the **Line Profile Browse** button to display the configured profiles. If the desired profile is not yet configured, you can configure it now. See “Configuring IDSL Line Profiles” on page 406 for instructions.

5 In the **Alarm Profile** boxes, type the desired alarm profile index for each port you want to configure.

Click the **Alarm Profile Browse** button to display the configured profiles. If the desired profile is not yet configured, you can configure it now. See “Configuring IDSL Alarm Profiles” on page 408 for instructions.

6 In the **Circuit ID** boxes, enter the circuit identifier for the port.

The circuit ID is the transmission vendor’s circuit identifier for the port. This identifier, which can facilitate troubleshooting, can be up to 255 characters.

7 Do one of the following:

- Click **Set** to activate the new settings.
- Click **Get** to cancel the new settings. You can only cancel the settings if you have not clicked **Set**.
- In the **Slot** box select the slot number to configure ports on another card.

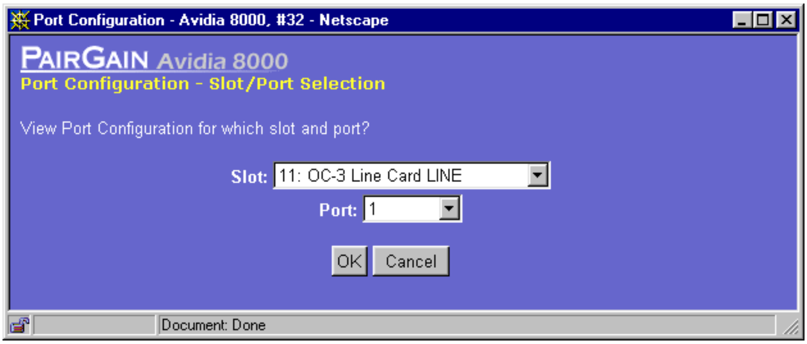
# Configuring Network Services 21

This chapter describes how to set up network-side services by configuring line card ports.

# CONFIGURING OC3 SERVICE

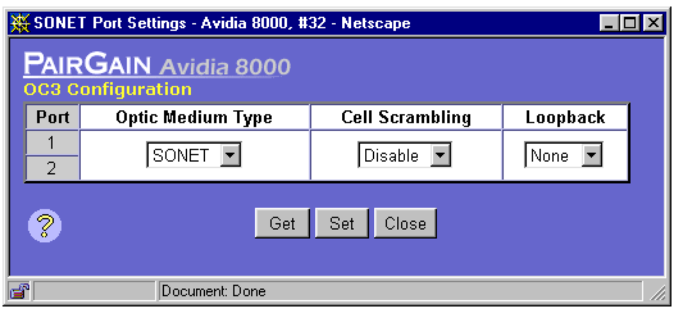
**1** Do one of the following to open the **Port Configuration - Slot/Port Selection** window.

- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.




**2** Select the slot and port you want to configure, then click **OK**.

The **OC3 Configuration** window displays.




**3** In the **Optic Medium Type** box, select the type of physical interface used on the selected card (**SONET** or **SDH**).

4. In the **Cell Scrambling** box, **Enable** or **Disable** cell scrambling.

   Enables or disables cell scrambling. Cell scrambling, used in Avidia, is not an ATM defined format for DS1, but is implemented by many vendors. An ATM cell has two parts: header and payload. Cell scrambling scrambles the payload so that it does not resemble the header. In the event that an ATM network looses sync, it will attempt to synchronize on what it sees as the cell header. In some cases, the cell payload can resemble the cell header, so the network attempts to synchronize on the cell payload rather than the cell header. Scrambling the cell payload precludes it from looking like a cell header. Choose to enable or disable cell scrambling based on whether or not the ATM equipment in the network supports cell scrambling.

5. Use the Loopback box to initiate a communication path loopback for the port. See "Initiating Communication Path Loopbacks" on page 563.

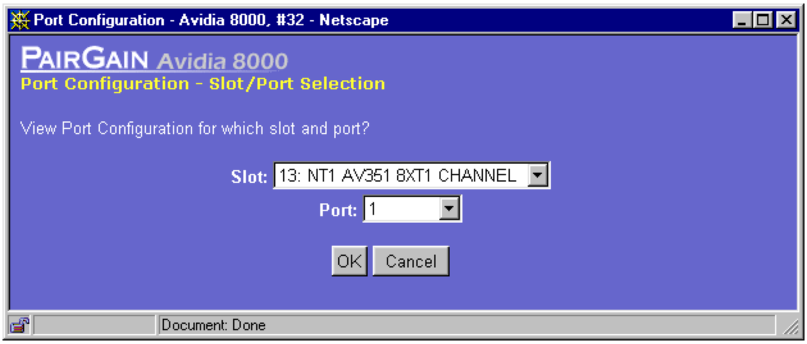
6. To activate the new settings, click **Set**.

# CONFIGURING DS1 SERVICE

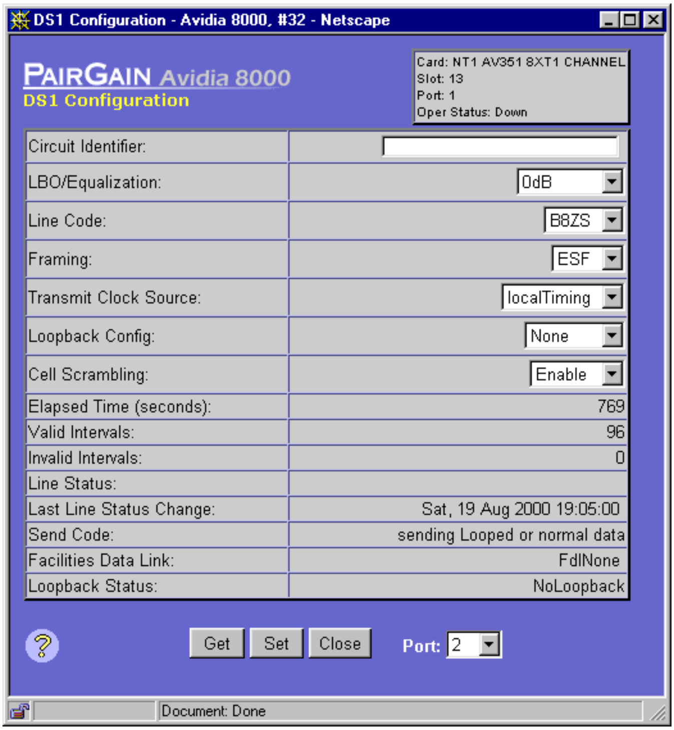
This section contains instructions for configuring service for DS1 line cards installed in either an Avidia 8000 or an Avidia 3000. To configure a DS1 line/management combination card installed in an Avidia 2200, you must first subtend the Avidia 2200 to an Avidia 8000 or an Avidia 3000 using the command-line interface (See "Subtending Multiple Systems" on page 45 and "Setting Up Connections" on page 70 for more information). Then, use in-band management or the command-line interface to configure DS1 service on the DS1 line/management card.

1 Do one of the following to open the **Port Configuration - Slot/Port Selection** window:

- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.




2 Select the slot and port you want to configure, then click **OK** to display the **DS1 Configuration** window.


DS1 Configuration - Avidia 8000, #32 - Netscape
PAIRGAIN Avidia 8000
DS1 Configuration
Card: NT1 AV351 8XT1 CHANNEL
Slot: 13
Port: 1
Oper Status: Down
Circuit Identifier:
LBO/Equalization: 0dB
Line Code: B8ZS
Framing: ESF
Transmit Clock Source: localTiming
Loopback Config: None
Cell Scrambling: Enable
Elapsed Time (seconds): 769
Valid Intervals: 96
Invalid Intervals: 0
Line Status:
Last Line Status Change: Sat, 19 Aug 2000 19:05:00
Send Code: sending Looped or normal data
Facilities Data Link: FdlNone
Loopback Status: NoLoopback
Get
Set
Close
Port: 2
Document: Done

The **DS1 Configuration** window displays the following status information that cannot be changed.

| Information | Descriptions |
|---|---|
| Card Description<br>Slot<br>Port | The slot number, port number and description of the selected card. |
| Oper Status | The current operational status of the selected port.<br>• **Up** indicates the port is operational and passing data.<br>• **Down** indicates that the port is not operational. |
| Elapsed Time | The number of seconds that have elapsed since the current 15-minute data collection period began. |
| Valid Intervals | The number of 15-minute data collection intervals supported. The Avidia system supports 96 intervals, or 24 hours, of data collection. |
| Invalid Intervals | The Avidia system does not have invalid intervals, therefore **0** displays. |
| Line Status | The status of the line interface. Options:<br>• dsx1NoAlarm—No alarm is present.<br>• dsx1RcvFarEndLOF—Remote loss of frame alarm.<br>• dsx1RcvAIS—Remote AIS.<br>• dsx1LossOfFrame—Local loss of frame alarm.<br>• dsx1LossOfSignal—Local loss of signal alarm. |
| Last Line Status Change | The time at which the line entered its current status (see the Line Status description above for a definition of line status). |
| Send Code | The type of data currently being transmitted. Currently, the only data type supported is **sending Looped or normal data**. |
| Facilities Data Link | This parameter is not currently supported, therefore **dsx1FdlNone** displays. Facilities Data Link is a protocol that enables communication with the remote device when in ESF mode. |
| Loopback Status | The type of physical layer loopback in effect. See "Initiating Communication Path Loopbacks" on page 563 for information about loopbacks. |

3 In the **Circuit Identifier** box, type a text string to identify the circuit.

4 In the **LBO/Equalization** box, do one of the following:

- For a DS1 line, select the equalization (**0 dB**, **-7.5 dB**, **-15 dB**, or **-22.5 dB**)
- For a DSX1 line, select the line length (**0 to 133 feet** (40 m), **133 to 266 feet** (81 m), **266 to 399 feet** (121 m), **399 to 533 feet** (162 m), or **533 to 655 feet** (200 m)).

5 In the **Line Code** box, select the type of coding on the line (**B8ZS** or **AMI**).

6 In the **Framing** box, select the type of line connected to the selected port (**Extended SuperFrame DS1** or **AT&T D4 format DS1**).

7 In the **Transmit Clock Source** box, select the type of timing in use (**loopTiming** or **localTiming**).

8 Use the Loopback box to initiate a communication path loopback for the port. See "Initiating Communication Path Loopbacks" on page 563.

9 In the **Cell Scrambling** box, **Enable** or **Disable** cell scrambling.

Enables or disables cell scrambling. Cell scrambling, used in Avidia, is not an ATM defined format for DS1, but is implemented by many vendors. An ATM cell has two parts: header and payload. Cell scrambling scrambles the payload so that it does not resemble the header. In the event that an ATM network looses sync, it will attempt to synchronize on what it sees as the cell header. In some cases, the cell payload can resemble the cell header, so the network attempts to synchronize on the cell payload rather than the cell header. Scrambling the cell payload precludes it from looking like a cell header. Choose to enable or disable cell scrambling based on whether or not the ATM equipment in the network supports cell scrambling.

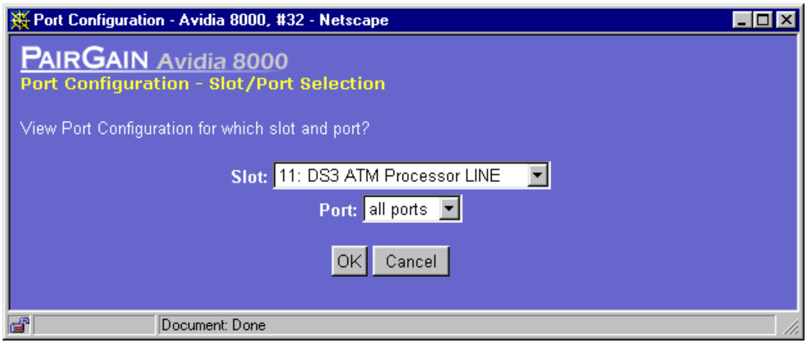
10 Do one of the following:

- To activate the new settings, click **Set**, then in the confirmation dialog click **Back** to return to the **DS1 Configuration** window.
- To cancel the new settings, click **Get**. You can only cancel the settings if you have not clicked **Set**.

# CONFIGURING DS3 SERVICE

1 Do one of the following to display the **Port Configuration - Slot/Port Selection** window:

- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.




2 Select the slot and port you want to configure, then click **OK** to display the **DS3 Configuration** window.


DS3 Configuration - Avidia 8000, #32 - Netscape
PAIRGAIN Avidia 8000
DS3 Configuration
Card: DS3 ATM Processor LINE
Slot: 11
Port: 1
Oper Status: Down
LBO: 0-225 feet
Framing: CbitParity
Transmit Clock Source: localTiming
Loopback Config: None
Cell Scrambling: Enable
ATM Mapping: Direct
Elapsed Time (seconds): 0
Valid Intervals: 96
Invalid Intervals: 0
Send Code: SendNoCode
Line Status: LOS
Last Line Status Change: Fri, 18 Aug 2000 19:04:56
Loopback Status: NoLoopback
Get
Set
Close
Document: Done

The **DS3 Configuration** window displays the following status information that cannot be changed.

| Information | Descriptions |
|---|---|
| Card Description<br>Slot<br>Port | The slot number, port number and description of the selected card. |
| Oper Status | The current operational status of the selected port.<br>• **Up** indicates the port is operational and passing data.<br>• **Down** indicates that the port is not operational. |
| Elapsed Time | The number of seconds that have elapsed since the current 15-minute data collection period began. |
| Valid Intervals | The number of 15-minute data collection intervals supported. The Avidia system supports 96 intervals, or 24 hours, of data collection. |
| Invalid Intervals | The Avidia system does not have invalid intervals, therefore **0** displays. |
| Send Code | The type of data currently being transmitted. Currently, only **SendNoCode** is supported, indicating that the line is sending looped or normal data. |
| Line Status | The status of the line interface. Options:<br>• **dsx3NoAlarm**—No alarms are present.<br>• **dsx3RcvRAIFailur**e—Receiving a remote alarm indication.<br>• **dsx3XmitRAIAlarm**—Transmitting a remote alarm indication.<br>• **dsx3RcvAIS**—Receiving an AIS.<br>• **dsx3XmitAIS**—Transmitting an AIS.<br>• **dsx3LOF**—Receiving a loss-of-frame error.<br>• **dsx3LOS**—Receiving a loss-of-signal error. |
| Last Line Status Change | The time and date of the last line status change. |
| Loopback Status | The type of physical layer loopback in effect. See “Initiating Communication Path Loopbacks” on page 563 for information about loopbacks. |

3 In the **LBO** box, select the line length (**0 to 225 feet** (68.58 m) or **225+ feet** ).

4 In the **Framing** box, select the type of line connected to the selected port (**M23** or **CbitParity**).

CbitParity is not currently supported.

5 In the **Transmit Clock Source** box, select the type of timing in use (**loopTiming** or **localTiming**).

6 Use the Loopback box to initiate a communication path loopback for the port. See “Initiating Communication Path Loopbacks” on page 563.

**7** In the **Cell Scrambling** box, **Enable** or **Disable** cell scrambling.

Enables or disables cell scrambling. Cell scrambling, used in Avidia, is not an ATM defined format for DS1, but is implemented by many vendors. An ATM cell has two parts: header and payload. Cell scrambling scrambles the payload so that it does not resemble the header. In the event that an ATM network looses sync, it will attempt to synchronize on what it sees as the cell header. In some cases, the cell payload can resemble the cell header, so the network attempts to synchronize on the cell payload rather than the cell header. Scrambling the cell payload precludes it from looking like a cell header. Choose to enable or disable cell scrambling based on whether or not the ATM equipment in the network supports cell scrambling.

**8** In the **ATM Mapping** box, select one of the following options that is compatible with your DS3 network:

- **PLCP** which provides the mapping of ATM cells to DS3 frames (12 ATM cells are mapped to a DS3 frame) using the ATM Physical Layer Convergence Protocol (PLCP)
- **Direct** (default) which provides a direct mapping of ATM cells to DS3 frames, but does not include the overhead of PLCP (such as frame alignment)

**9** Do one of the following:

- To activate the new settings, click **Set**, then in the confirmation dialog click **Back** to return to the **DS3 Configuration** window.
- To cancel the new settings, click **Get**. You can only cancel the settings if you have not clicked **Set**.

# CONFIGURING ATM VIRTUAL CIRCUITS 22

This chapter describes how to establish connections between ports across the Avidia chassis.

# CONFIGURING ATM TRAFFIC PROFILES

You configure ATM traffic profiles from the **ATM Traffic Descriptor Configuration Table** window. To open the **ATM Traffic Descriptor Configuration Table** window:

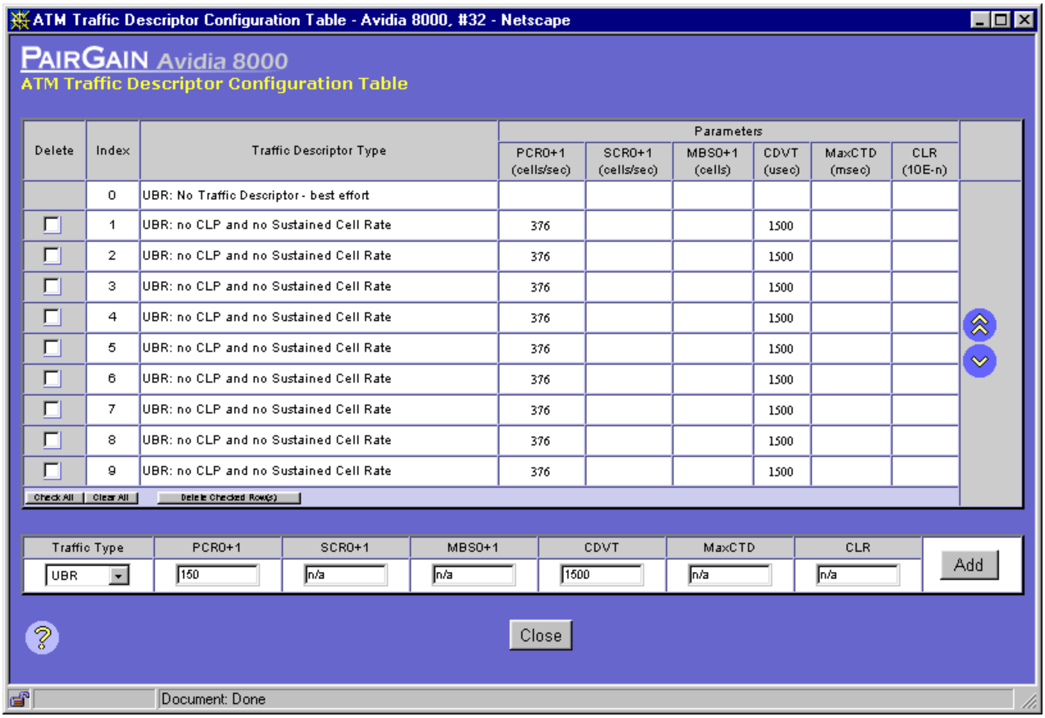
**1** Do one of the following:

- In the **Site Map Navigation** window, click **PVCC Configuration**, **PVPC Configuration** or **SPVC Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **ATM**. Then click **PVCC Configuration**, **PVPC Configuration** or **SPVC Configuration**.

**2** In the window you opened in Step 1, click ⊕.

**3** In the Traffic Profile box, click **Browse**.

The **ATM Traffic Descriptor Configuration Table** window displays the configured ATM traffic profiles.



## Adding ATM Traffic Profiles

ATM traffic profiles are stored in the **ATM Traffic Descriptor Configuration Table** window. Each profile has an index number assigned to it. You use the index number to assign a profile to an ATM connection.

**1** In the **Traffic Type** box, select the desired traffic descriptor type (**UBR**, **CBR**, **rt-VBR** or **nrt-VBR**).

The text boxes to the right display the default parameter values for the selected traffic type.

**2** Type the desired information in the text boxes as follows:

| Parameter | Description | Valid Range | Applies to Traffic Types… |
|---|---|---|---|
| PCR0+1 | The desired peak cell rate to apply to both tagged and non-tagged cells, in cells per second. | 150-353,207 | UBR, CBR, rt-VBR, nrt-VBR |
| SCR0+1 | The sustainable cell rate, or minimum guaranteed transmission rate, to be applied to all cells, in cells per second. | 150-353,207 | rt-VBR, nrt-VBR |
| MBS0+1 | The maximum burst size, or maximum number of cells that can be transmitted at the peak rate, in cells. | 1-65,536 | rt-VBR, nrt-VBR |
| CDVT | The maximum allowable Cell Delay Variation Tolerance, or delay between consecutive ATM cells, in cells per second. | 150-080,000 | UBR, CBR, rt-VBR, nrt-VBR |
| MaxCTD | The Maximum Cell Transfer Delay, or elapsed time between the transmission of a cell and the receipt of that cell at its destination, in microseconds. | 20-1,000 | CBR, rt-VBR, nrt-VBR |
| CLR | The maximum Cell Loss Ratio, or number of lost cells divided by the total number of transmitted cells. | 5-12 | CBR, rt-VBR, nrt-VBR |

**3** To activate the profile, click Add. The new profile is assigned an index number and is displayed in the **ATM Traffic Descriptor Table**.

## Deleting ATM Traffic Profiles

**You cannot delete profiles that are assigned to ports.**

1 In the **ATM Traffic Descriptor Configuration Table** window, locate the table row that contains the ATM traffic descriptor profile you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

2 Select the **Delete** check box next to the row that contains the profile you want to delete. To select the **Delete** check box for all rows (except the default profile, which cannot be deleted), click **Check All**.

If you decide not to delete a selected row, clear the **Delete** check box next to the row. Click **Clear All** to clear the **Delete** check box for all rows.

3 Click **Delete Checked Row(s)** to delete the profiles.

A confirmation dialog displays.

4 Click **OK** to delete the selected table rows, otherwise click **Cancel**.

# CONFIGURING APS

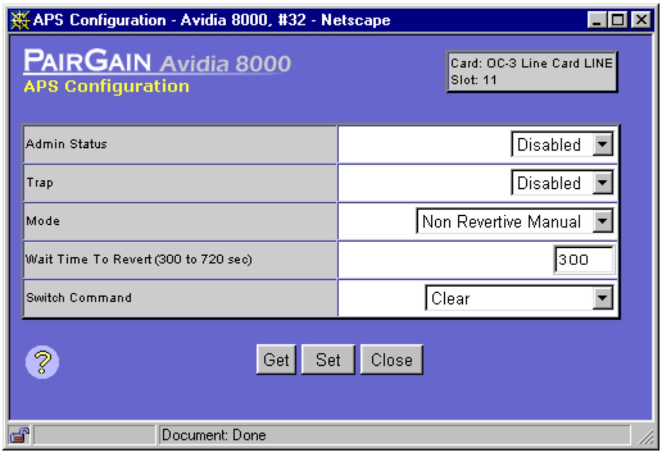
Avidia systems use Automatic Protection Switching (APS) to switch ATM traffic from the main SONET channel (the working channel) to a secondary SONET channel (the protection channel) when a failure occurs. This redundancy enables service to continue despite failures on the working SONET channel.

You configure APS from the **APS Configuration** window.

1 Do one of the following to open the **APS Configuration - Slot Selection** window:

- In the **Site Map Navigation** window, click **APS Configuration**.
- In the **Tree Navigation** window, click **Administration**, **APS Configuration**.

**2** Select the slot you want to configure, then click **OK** to display the **APS Configuration** window.




## Configuring APS

**1** In the **Admin Status** box, select **Enabled** or **Disabled** to enable or disable APS.

The default is disabled.

**2** In the **Trap** box, select **Enabled** or **Disabled** to enable or disable APS trap generation.

**3** In the **Mode** box, select the desired APS mode:

- **Non Revertive Manual**—once traffic has switched to the protection channel it will not automatically switch back to the working channel when the failure on that channel has been cleared (this is the default).
- **Non Revertive Auto**—once traffic has switched to the protection channel it will automatically switch back to the working channel when the system detects an error on the protection channel and the failure on the working channel has been cleared.
- **Revertive**—once traffic has switched to the protection channel, it will automatically switch back to the working channel when the failure on the working channel has been cleared for a user-specified amount of time.

4. If you selected **Revertive** in Step 3, in the **Wait Time To Revert** box type the number of seconds that you want the system to wait before switching traffic from the protection channel back to the working channel after a failure on the main channel has been cleared. Otherwise, skip this step.

   The range is 300 to 720 seconds. The default is 300 seconds.

5. Do one of the following:

   - To activate the settings and close the **APS Configuration** window, click **Set**, then in the confirmation dialog click **Back**.
   - Click **Get** to cancel the new settings. You can only cancel the new settings if you have not clicked **Set**.

## Issuing Manual APS Commands

Once APS is enabled, if the APS is currently set to either Non Revertive mode, you can override the configured APS operation by selecting one of the following APS commands. After issuing a manual APS command, you must issue a **Clear** command to resume the configured APS operation.

1. In the **Switch Command** box, select the desired manual APS command.

   - **Clear**—clears any of the following manual commands.
   - **Lockout Protection**—disables APS.
   - **Force to Protection**—switches traffic to the protection channel.
   - **Force to Working**—switches traffic to the working channel.
   - **To Working If Ready**—switches traffic to the working channel if there are not other conditions (such as the configured Wait To Revert Time or a failure condition) that prohibit switching to that channel.

2. Do one of the following:

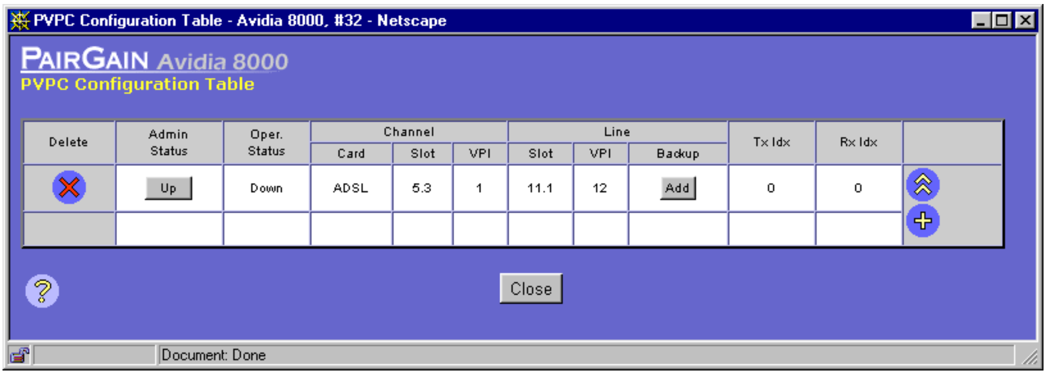
   - To activate the settings and close the **APS Configuration** window, click **Set**, then in the confirmation dialog click **Back**.
   - Click **Get** to cancel the new settings. You can only cancel the new settings if you have not clicked **Set**.

# CONFIGURING PVPCS

Configure PVPCs from the **PVPC Configuration Table** window. From this window, you can optionally configure backup PVPCs for the primary PVPCs. Backup PVPCs are redundant to primary PVPCs. A primary PVPC automatically switches to a backup PVPC if the primary PVPC were to fail. Do one of the following to open the **PVPC Configuration Table** window:

- In the **Site Map Navigation** window, click **ATM** then **PVPC Configuration Table**.
- In the **Tree Navigation** window, click **Configuration Management, ATM,** then **PVPC Configuration**.

The **PVPC Configuration Table** window displays.




PVPCs carry data between defined points within the Avidia chassis, such as between a cell-based channel card and a line card (see “Configuring PVCCs” on page 443 for creating cross-connects from a frame-based channel card). PVPCs also carry data from subscriber modems to Avidia channel cards, and from Avidia line cards to other destinations in the ATM backbone network.

PVPC configuration requires specifying a Virtual Path Identifier (VPI). For PVPCs, the system only translates the VPI value and does not check or change any configured Virtual Channel Identifier (VCI) value.

The following sections provide instruction on:

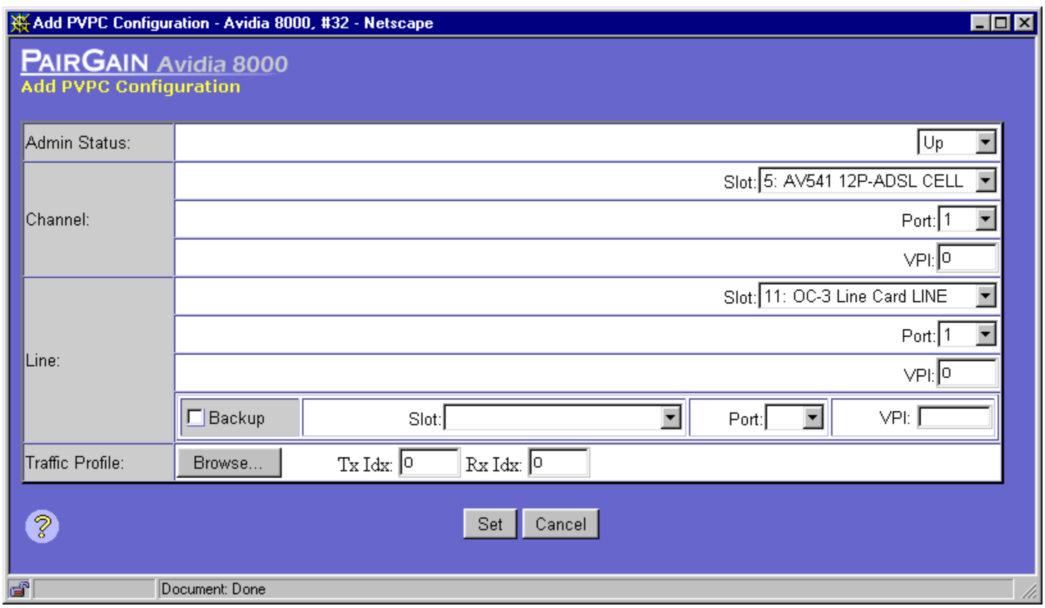
- adding primary PVPCs (page 434)
- changing PVPC admin status (page 437)
- deleting PVPCs (page 438)
- adding backup PVPCs (page 439)
- deleting backup PVPCs (page 441)
- returning service from a backup PVPC to a primary PVPC (page 442)

## Adding Primary PVPCs

See page 433 to open the **PVPC Configuration Table** window. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table. You can configure cross-connect PVPCs between any two cell-based cards in an Avidia chassis (see "Configuring PVCCs" on page 443 for creating cross-connects from a frame-based channel card).

**1** In the **PVPC Configuration Table** window, click .

The **Add PVPC Configuration** window displays. The **PVPC Configuration Table** index number is automatically assigned, therefore no **Index** box displays.



2 In the **Admin Status** box, select the administrative status for the PVPC (**Up** or **Down)**.

**Up** activates the PVPC. **Down** deactivates the PVPC.

3 In the **Channel Slot** box, select the channel-side card slot number you want to use for this PVPC.

4 In the **Channel Port** box, select the channel-side card port number you want to use for this PVPC.

5 In the **Channel VPI** box, type the subscriber-side VPI for this PVPC.

See the table on page 24 for a summary of the supported VPI ranges for each card.

6 In the **Line Slot** box, select the slot number of the line-side card you want to use for this PVPC.

7 In the **Line Port** box, select the line-side card port number you want to use for this PVPC.

8 In the **Line VPI** box, type a network-side VPI for this PVPC.

See the table on page 24 for a summary of the supported VPI ranges for each card.

9 If you want to create a backup PVPC for the primary PVPC, in the **Line** box select **Backup**. Then, do the following:

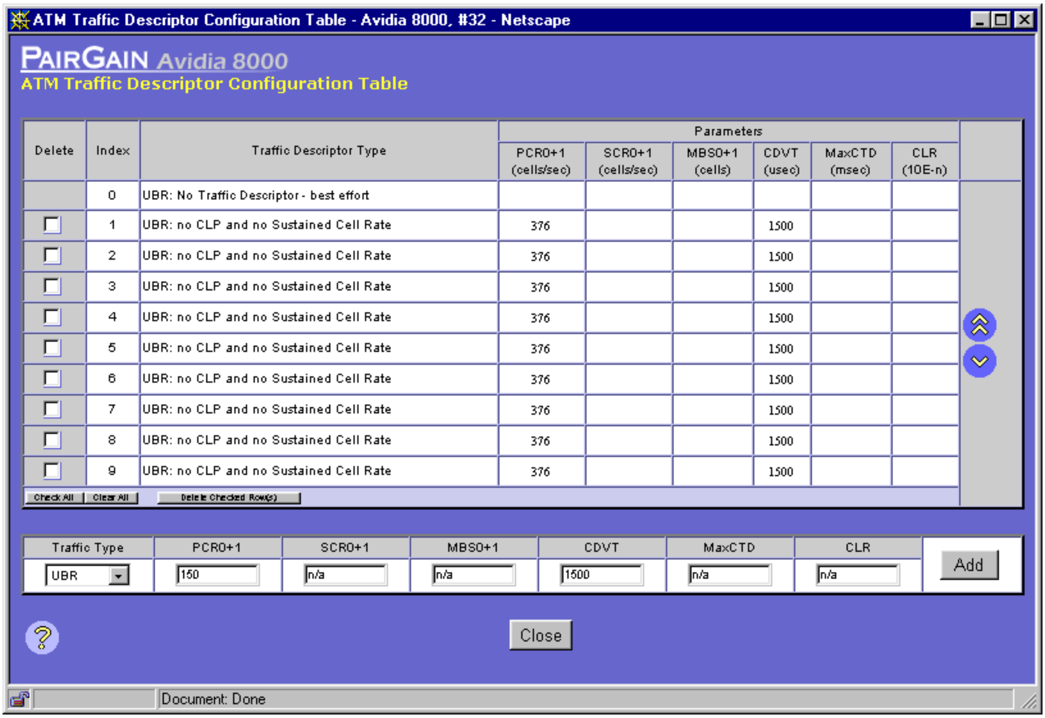
   a In the **Backup Slot** box, select the slot number for the secondary line-side card you want to use for this backup PVPC.

   b In the **Backup Port** box, select the port number for the secondary line-side card you want to use for this backup PVPC.

   c In the **Backup VPI** box, type a network-side VPI for this backup PVPC. The VPI value can be either the same value as the primary PVPC or a different value for the backup PVPC.

   See the table on page 24 for a summary of the supported VPI ranges for each card.

10 In the **Traffic Profile** box, click **Browse** to display the **ATM Traffic Descriptor Configuration Table** window.




**11** Identify the two index numbers for the profiles you want to apply to the downstream and upstream traffic directions for this PVPC, then **Close** the **ATM Traffic Descriptor Configuration Table** window.

**12** In the **Traffic Profile Tx Idx** box (page 434), enter the index number for the downstream traffic direction.

**13** In the **Traffic Profile Rx Idx** box (page 434), enter the index number for the upstream traffic direction.

**14** In the **Add PVPC Configuration** window (page 434), do one of the following:

- To activate the settings and close the **Add PVPC Configuration** window, click **Set**, then in the confirmation dialog click **Back**.
- To cancel the settings and close the **Add PVPC Configuration** window, click **Cancel**.

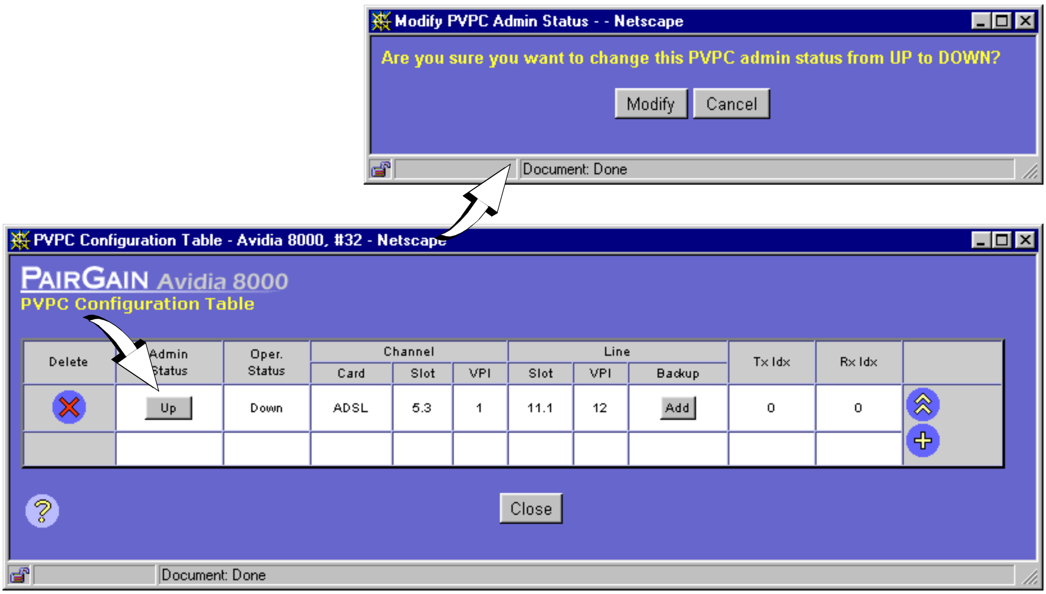
## Changing PVPC Admin Status

See page 433 to open the **PVPC Configuration Table** window, then change the **Admin Status**.

1 In the **PVPC Configuration Table** window, click the **Admin Status** button in the table row that contains the PVPC for which you want to change the status.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table. The **Admin Status** button toggles between **Up** and **Down**. **Up** activates the PVPC; **Down** deactivates the PVPC.

A confirmation dialog displays.




2 Do one of the following:

- Click **Modify** to save the new admin status, then click **Back** to return to the **PVPC Configuration Table** window.
- Click **Cancel** to return to the **PVPC Configuration Table** window without changing the administrative status.

## Deleting PVPCs

See page 433 to open the **PVPC Configuration Table** window, then delete PVPCs.

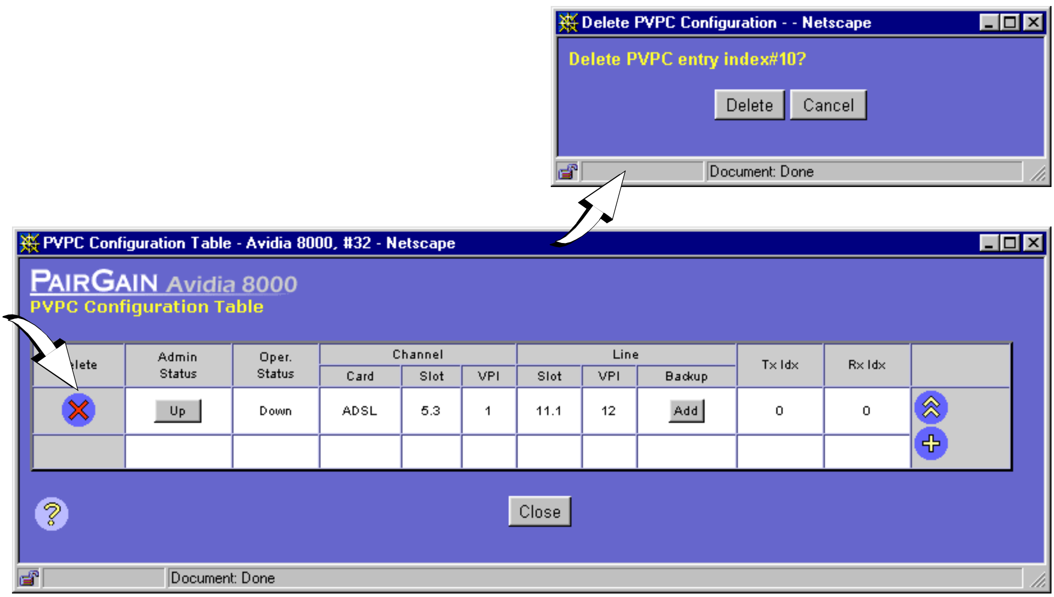
**If you remove a card from the system, the PVPCs associated with the ports on that card are disabled, however the PVPC configuration is not automatically removed from the PVPC Configuration Table. Be sure to delete unused PVPC configurations so the PVPC Configuration Table accurately reflects the PVPCs in use in the system.**

**1** In the **PVPC Configuration Table** window, locate the table row that contains the PVPC you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Click next to the row that contains the information you want to delete.

A confirmation dialog displays.



**3** Do one of the following:

- Click **Delete** to delete the selected PVPC, then in the confirmation dialog click **Back** to return to the **PVPC Configuration Table** window.
- Click **Cancel** to return to the **PVPC Configuration Table** window without deleting the PVPC.

## Adding Backup PVPCs

See page 433 to open the **PVPC Configuration Table** window. Create backup PVPCs by doing one of the following:

- when creating a new primary PVPC, also create the backup PVPC
- when adding a backup PVPC to an existing primary PVPC

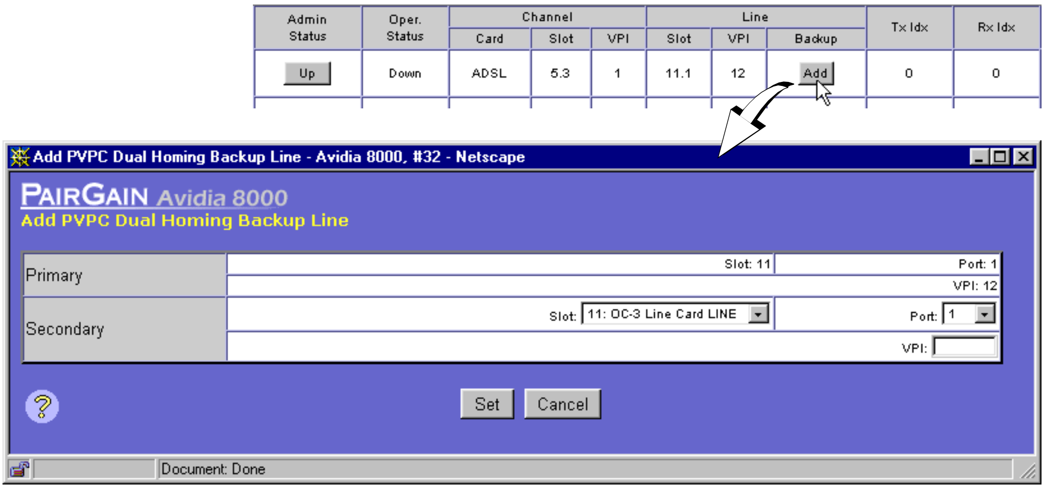
### Add When Creating New Primary PVPC

Create the backup PVPC when you create a new primary PVPC using the steps in “Adding Primary PVPCs” on page 434.

## Add to an Existing Primary PVPC

**1** From the **PVPC Configuration Table** window, click **Add** under **Backup** for the PVPC for which you will create a backup.

The following **Add PVPC Dual Homing Backup Line** window displays. In the **Primary** box, the **Slot**, **Port**, and **VPI** values for the primary PVPC automatically display.




**2** In the **Secondary Slot** box, select the slot for the secondary or backup line-side card you want to use for this backup PVPC.

**3** In the **Secondary Port** box, select the port number for the secondary line-side card you want to use for this backup PVPC.

**4** In the **Secondary VPI** box, type a network-side VPI for this backup PVPC. The VPI number can be either the same value as the primary PVPC or a different value for the backup PVPC.

See the table on page 24 for a summary of the supported VPI ranges for each card.

**5** Do one of the following:

- To activate the secondary or backup PVPC and close the **Add PVPC Dual Homing Backup Line** window, click **Set**, then in the confirmation dialog click **Back**.
- To return to the **PVPC Configuration Table** window without deleting the table entry, click **Cancel**.

## Deleting Backup PVPCs

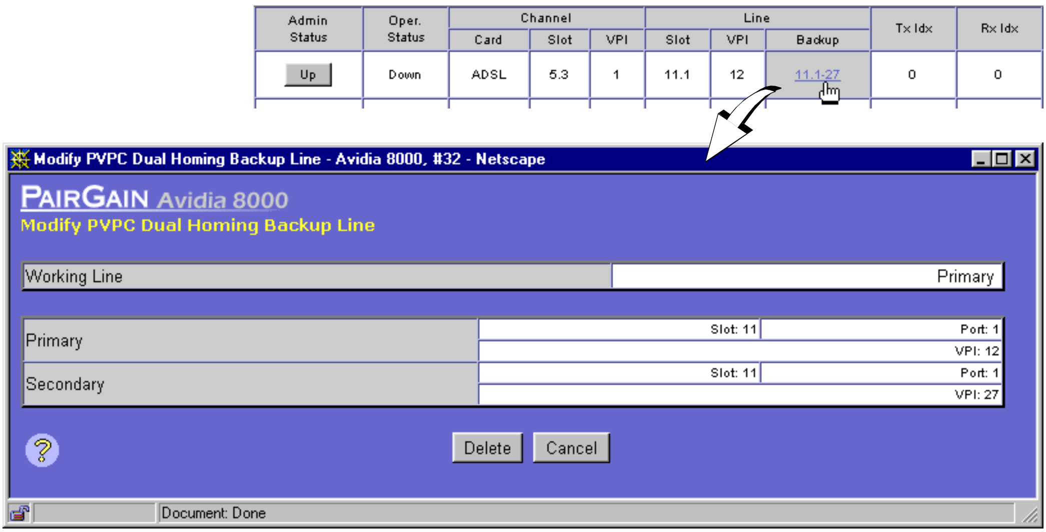
See page 433 to open the **PVPC Configuration Table** window. From the **Modify PVPC Dual Homing Backup Line** window, you can only delete a backup PVPC.

**1** Locate the table row that contains the **PVPC Configuration Table** entry you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Under **Backup** for the backup PVPC you want to delete, click the **Backup** value.

The following **Modify PVPC Dual Homing Backup Line** window displays. In the **Primary and Secondary** boxes, the **Slot**, **Port**, and **VPI** values automatically display. The working line indicates whether the **Primary** or **Secondary** PVPC is active.




**3** Do one of the following:

- Click **Delete** to delete the secondary PVPC, then in the confirmation dialog click **Back** to return to the **PVPC Configuration Table** window.
- Click **Cancel** to return to the **PVPC Configuration Table** window without deleting the table entry.

## Returning Service from a Backup PVPC to a Primary PVPC

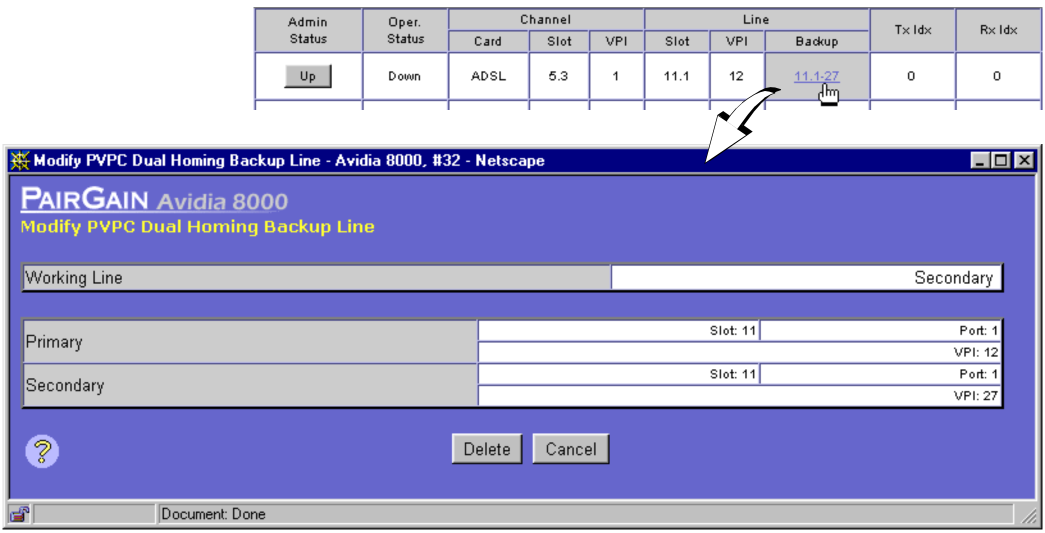
See page 433 to open the **PVPC Configuration Table** window, then restore service to the primary PVPC.

**1** Locate the table row that contains the primary PVPC that has switched to a backup PVPC.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Under **Backup** for the backup PVPC for which you want to return service to the Primary PVPC, click the **Backup** value.

The following **Modify PVPC Dual Homing Backup Line** window displays. The working line indicates that the **Secondary** or backup PVPC is active.



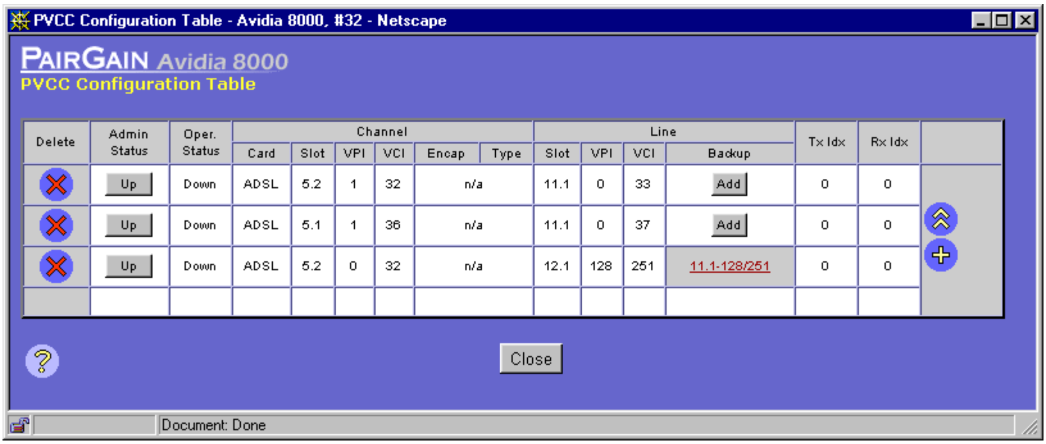

**3** Click **Restore** to return service to the primary PVPC.

# CONFIGURING PVCCS

Configure PVCCs from the **PVCC Configuration Table** window. From this window, you can optionally configure backup PVCCs for the primary PVCCs. Backup PVCCs are redundant to primary PVCCs. A primary PVCC automatically switches to a backup PVCC if the primary PVCC were to fail. Do one of the following to open the **PVCC Configuration Table** window:

- In the **Site Map Navigation** window, click **ATM** then **PVCC Configuration Table**.
- In the **Tree Navigation** window, click **Configuration Management, ATM,** then **PVCC Configuration**.

The **PVCC Configuration Table** window displays.




PVCCs carry data between defined points within the Avidia chassis, such as between a channel card and a line card. PVCCs also carry data from subscriber modems to Avidia channel cards, and from Avidia line cards to other destinations in the ATM backbone network.

PVCC configuration requires specifying a VPI and a VCI. VPI and VCI combinations must be unique only on the same user port, as the circuit is remapped to a different VPI and VCI on the network interface. This enables different subscribers to use the same VPI and VCI combinations without creating conflict in the network.

The following sections provide instruction on:

- adding primary PVCCs (page 444)
- changing PVCC admin status (page 448)
- deleting PVCCs (page 449)
- adding backup PVCCs (page 450)
- deleting backup PVCCs (page 452)
- returning service from a backup PVCC to a primary PVCC (page 453)

## Adding Primary PVCCs

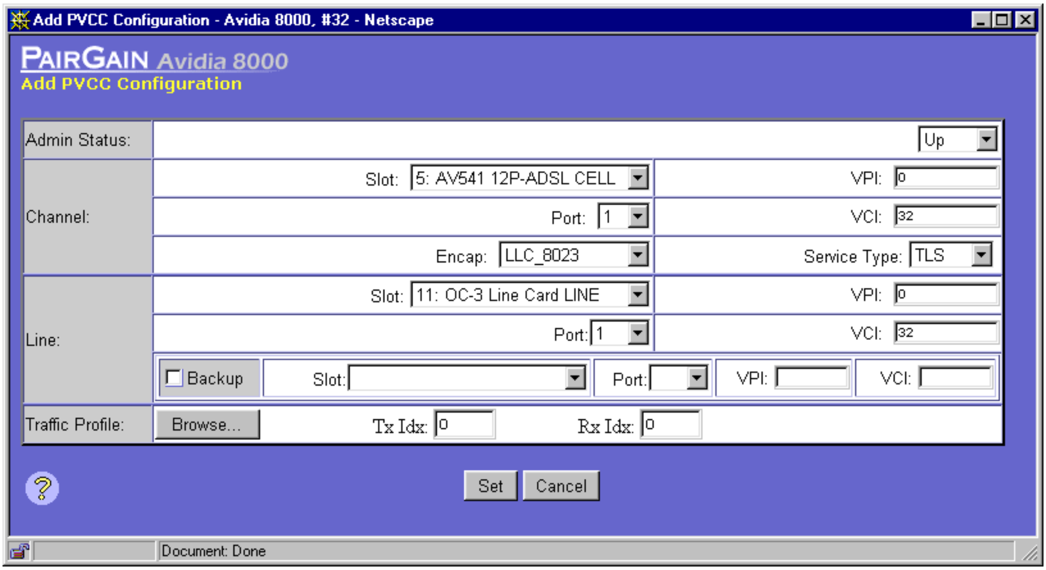
See page 443 to open the **PVCC Configuration Table** window. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table. You can configure cross-connect PVCCs between any two cards in an Avidia chassis.

**For frame channel cards, the VPI is always zero and the system automatically assigns the VCI. Therefore, you do not enter this information during frame channel card PVCC configuration.**

**Also, all PVCCs configured on frame channel cards are automatically set for Transparent Lan Service (TLS).**

1  In the **PVCC Configuration Table** window, click .

The **PVCC Configuration Table** window displays. The **PVCC Configuration Table** index number is automatically assigned, therefore no **Index** box displays.




2  In the **Admin Status** box, select the desired setting (**Up** or **Down)**.

**Up** activates the PVCC. **Down** deactivates the PVCC.

3  In the **Channel Slot** box, select the slot number you want to use for this PVCC.

4  In the **Channel Port** box, select the port number you want to use for this PVCC.

5  In the **Channel VPI** box, type the subscriber-side VPI for this PVCC. (The VPI is always zero for frame channel cards.)

See the table on page 24 for a summary of the supported VPI ranges for each card.

6  In the **Channel VCI** box, type a subscriber-side VCI for this PVCC.

Be sure the VPI/VCI combination specified in this step and Step 5 are not already in use on this port. Open the **PVCC Configuration Table** window to view the configured VCIs. See the table on page 24 for a summary of the supported VCI ranges for each card.

7  In the **Channel Type** box, select the service type. TLS is the default service type for all channel cards except IDSL.

For an IDSL channel card, select the service type that is the same as that of the IDSL modem. Select one: **TLS**, **RAMP1483**, or **PPP**.

8 In the **Channel Encap** box, select the encapsulation mode. (For **TLS** service type, select **llc-8023** or **vc-mux-8023**. For **PPP** service type, select **LC-PPP** or **VC-MUX-PPP**. For **RAMP1483** proprietary protocol service type, select **VC-MUX-RAMP**.)

This setting must match the encapsulation protocol used at the remote end. The default is **llc-8023** encapsulation. The llc-8023 (Logical Link Control) encapsulation is supported by most ATM devices but has more overhead than vc-mux encapsulation. Use llc-8023 only if the remote device that is connected to the frame channel card port uses RFC1483 Ethernet bridging (it will not work with token ring networks). Vc-mux-8023 does not use an encapsulation header and works with any network protocol. Both encapsulation modes are from ietf RFC1483 Multiprotocol Encapsulation over ATM Adaptation Layer 5.

9 In the **Line Slot** box, select the slot number of the line card you want to use for this PVCC.

10 In the **Line Port** box, select the line card port number you want to use for this PVCC.

11 In the **Line VPI** box, select the network-side VPI for this PVCC.

See the table on page 24 for a summary of the supported VPI ranges for each card.

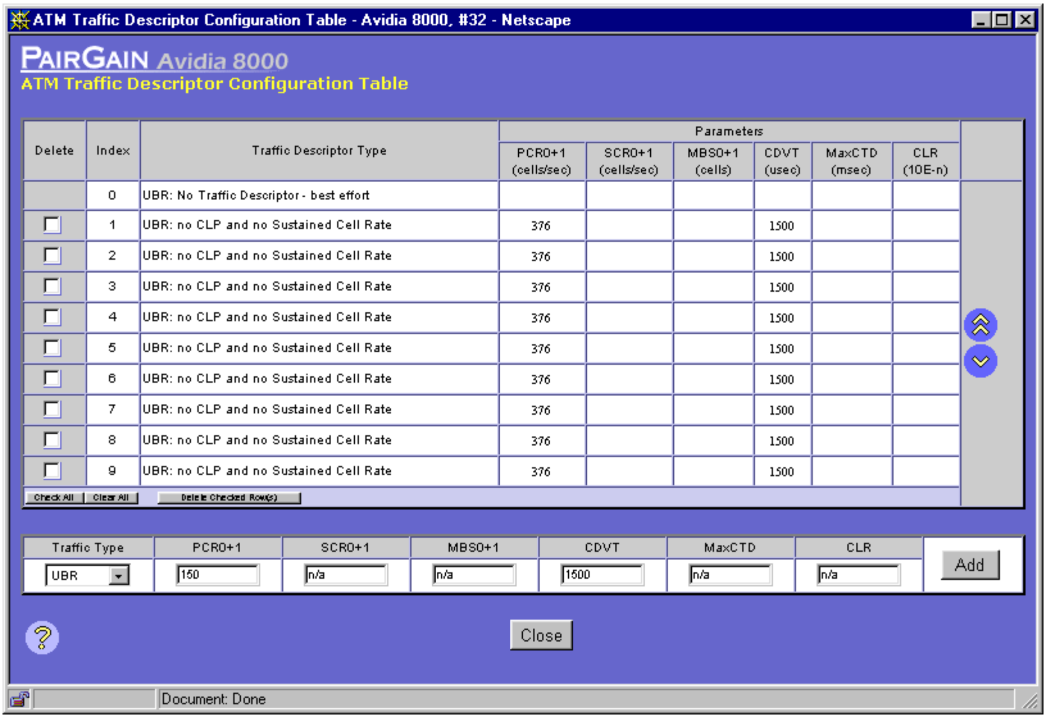
12 In the **Line VCI** box, type the network-side VCI for this PVCC.

Be sure the VPI/VCI combination specified in this step and Step 11 are not already in use on this port. Open the **PVCC Configuration Table** window to view the configured VCIs. See the table on page 24 for a summary of the supported VCI ranges for each card.

13 If you want to create a backup PVCC for the primary PVCC, in the **Line** box select **Backup**. Then, do the following:

- **a** In the **Backup Slot** box, select the slot number for the secondary line-side card you want to use for this backup PVCC.
- **b** In the **Backup Port** box, select the port number for the secondary line-side card you want to use for this backup PVCC.
- **c** In the **Backup VPI** box, type a network-side VPI for this backup PVCC. The VPI value can be either the same value as the primary PVCC or a different value for the backup PVCC.
- **d** In the **Backup VCI** box, type a network-side VCI for this backup PVCC. The VCI value can be either the same value as the primary PVCC or a different value for the backup PVCC.

14 In the **Traffic Profile** box, click **Browse** to display the **ATM Traffic Descriptor Configuration Table** window.




**15** Identify the two index numbers for the profiles you want to apply to the downstream and upstream traffic directions for this PVCC, then **Close** the **ATM Traffic Descriptor Configuration Table** window.

**16** In the **Traffic Profile Tx Idx** box (page 443), enter the index number for the downstream traffic direction.

**17** In the **Traffic Profile Rx Idx** box (page 443), enter the index number for the upstream traffic direction.

**18** Do one of the following in the **Add PVCC Configuration** window (page 443):

- To activate the settings and close the **Add PVCC Configuration** window, click **Set**, then in the confirmation dialog click **Back**.
- To cancel the settings and close the **Add PVCC Configuration** window, click **Cancel**.

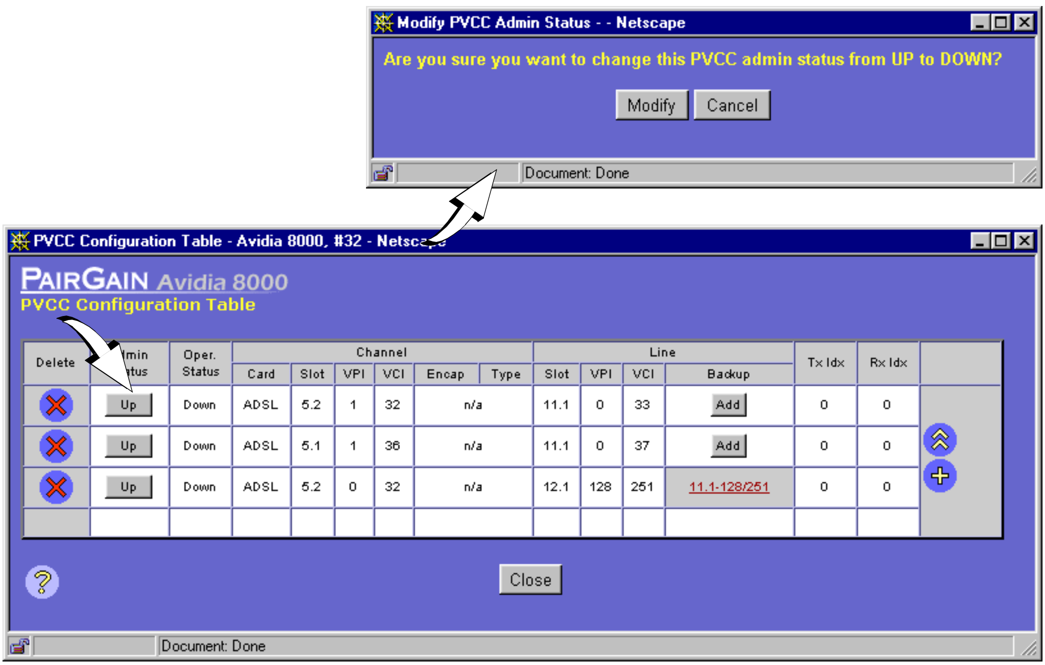
## Changing PVCC Admin Status

1 See page 443 to open the **PVCC Configuration Table** window.

2 In the **PVCC Configuration Table** window, click the **Admin Status** button in the table row that contains the PVCC for which you want to change the status.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table. The **Admin Status** button toggles between **Up** and **Down**. **Up** activates the PVCC. **Down** deactivates the PVCC.

A confirmation dialog displays.




3 Do one of the following:

- Click **Modify** to save the new admin status, then click **Back** to return to the **Cell Channel Card PVCC Configuration Table** window.
- Click **Cancel** to return to the **Cell Channel Card PVCC Configuration Table** window without changing the admin status.

## Deleting PVCCs

See page 443 to open the **PVCC Configuration Table** window, then delete PVCCs.

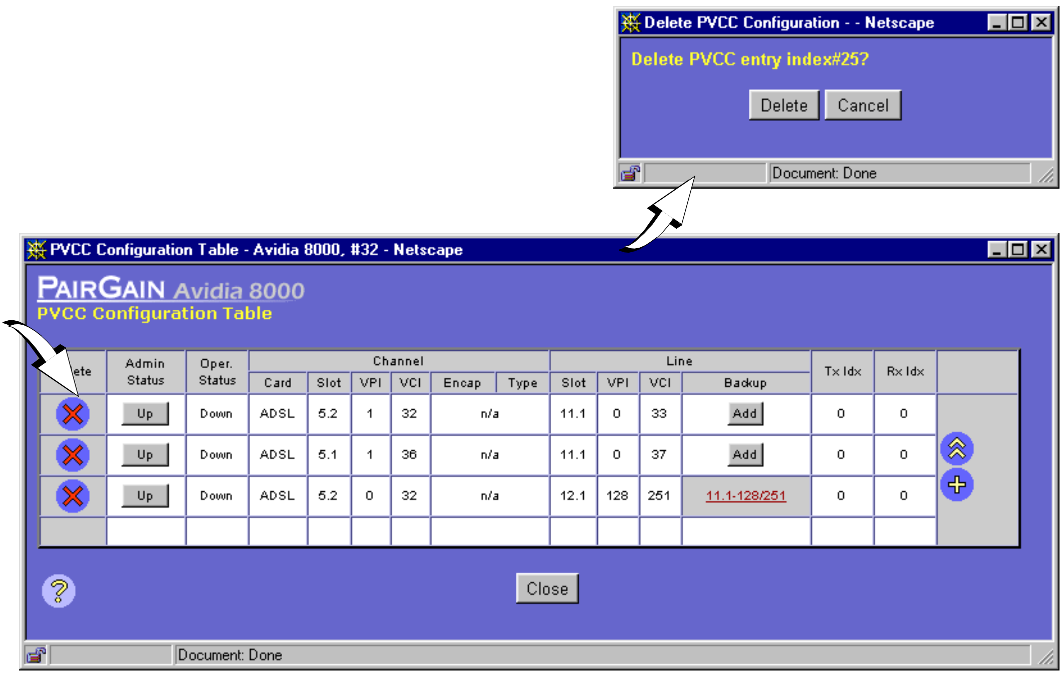
**If you remove a card from the system, the PVCCs associated with the ports on that card are disabled, however the PVCC configuration is not automatically removed from the PVCC Configuration Table. Be sure to delete unused PVCC configurations so that the PVCC Configuration Table accurately reflects the PVCCs in use in the system.**

1 In the **PVCC Configuration Table** window, note the table row that contains the PVCC you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

2 Click next to the row that contains the information you want to delete.

A confirmation dialog displays.



**3** Do one of the following:

- Click **Delete** to delete the selected profile, then in the confirmation dialog click **Back** to return to the **PVCC Configuration Table** window.
- Click **Cancel** to return to the **PVCC Configuration Table** window without deleting the profile.

## Adding Backup PVCCs

See page 443 to open the **PVCC Configuration Table** window. Create backup PVCCs by doing one of the following:

- when creating a new primary PVCC, also create the backup PVCC
- when adding a backup PVCC to an existing primary PVCC

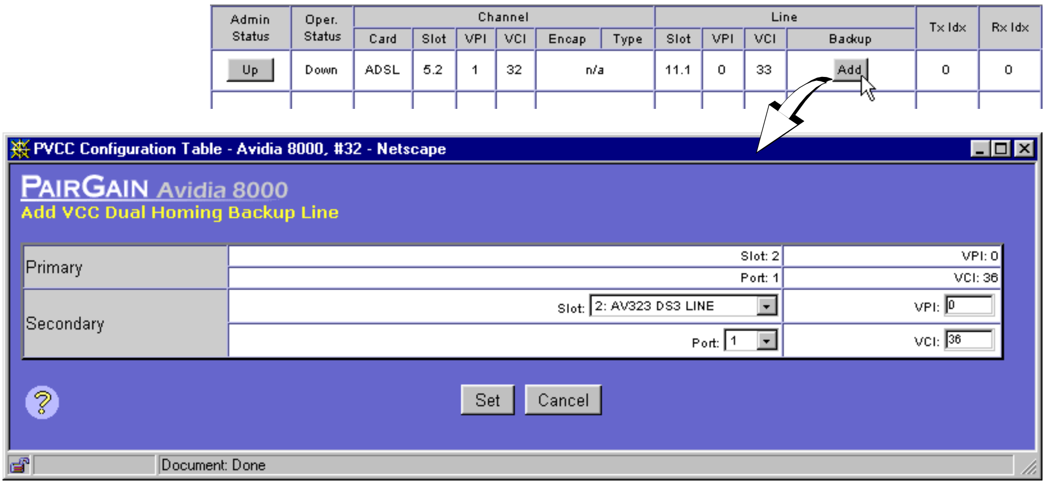
### Add When Creating New Primary PVCC

Create the backup PVCC when you create a new primary PVCC using the steps in “Adding Primary PVCCs” on page 444.

## Add to an Existing Primary PVCC

1 From the **PVCC Configuration Table** window, click **Add** under **Backup** for the PVCC for which you will create a backup.

The following **Add PVCC Dual Homing Backup Line** window displays. In the **Primary** box, the **Slot**, **Port**, and **VPI** values for the primary PVCC automatically display.




2 In the **Secondary Slot** box, select the slot for the secondary or backup line-side card you want to use for this backup PVCC.

3 In the **Secondary Port** box, select the port number for the secondary line-side card you want to use for this backup PVCC.

4 In the **Secondary VPI** box, type a network-side VPI for this backup PVCC. The VPI number can be either the same value as the primary PVCC or a different value for the backup PVCC.

See the table on page 24 for a summary of the supported VPI ranges for each card.

5 In the **Secondary** box, type a network-side **VCI** for this backup PVCC. The VCI number can be either the same value as the primary PVCC or a different value for the backup PVCC.

6 Do one of the following:

- To activate the secondary or backup PVCC and close the **Add PVCC Dual Homing Backup Line** window, click **Set**, then in the confirmation dialog click **Back**.
- To return to the **PVCC Configuration Table** window without deleting the table entry, click **Cancel**.

## Deleting Backup PVCCs

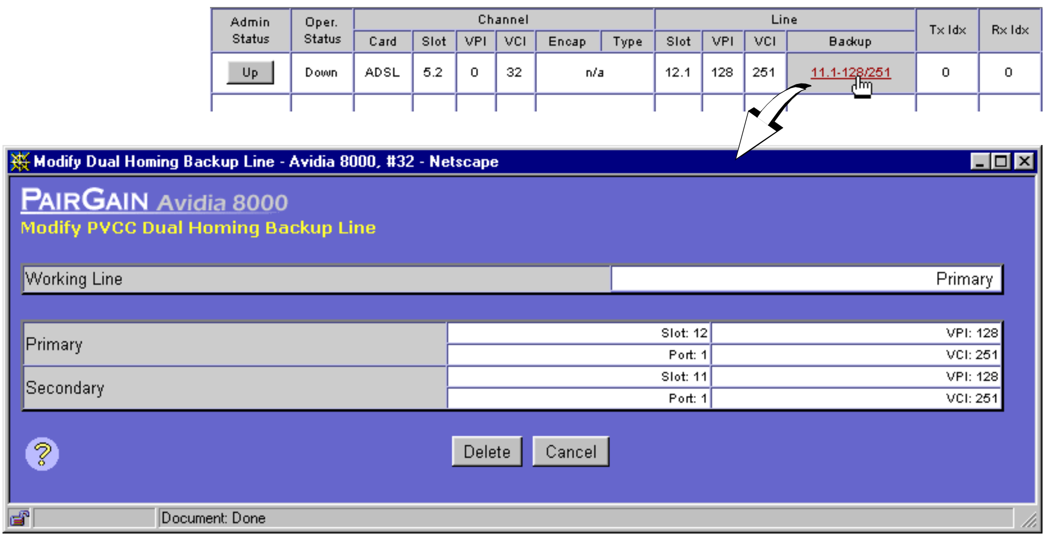
See page 443 to open the **PVCC Configuration Table** window. From the **Modify PVCC Dual Homing Backup Line** window, you can only delete a backup PVCC.

**1** Locate the table row that contains the **PVCC Configuration Table** entry you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Under **Backup** for the backup PVCC you want to delete, click the **Backup** value.

The following **Modify PVCC Dual Homing Backup Line** window displays. In the **Primary and Secondary** boxes, the **Slot**, **Port**, and **VPI** values automatically display. The working line indicates whether the **Primary** or **Secondary** PVCC is active.




**3** Do one of the following:

- Click **Delete** to delete the secondary PVCC, then in the confirmation dialog click **Back** to return to the **PVCC Configuration Table** window.
- Click **Cancel** to return to the **PVCC Configuration Table** window without deleting the table entry.

## Returning Service from a Backup PVCC to a Primary PVCC

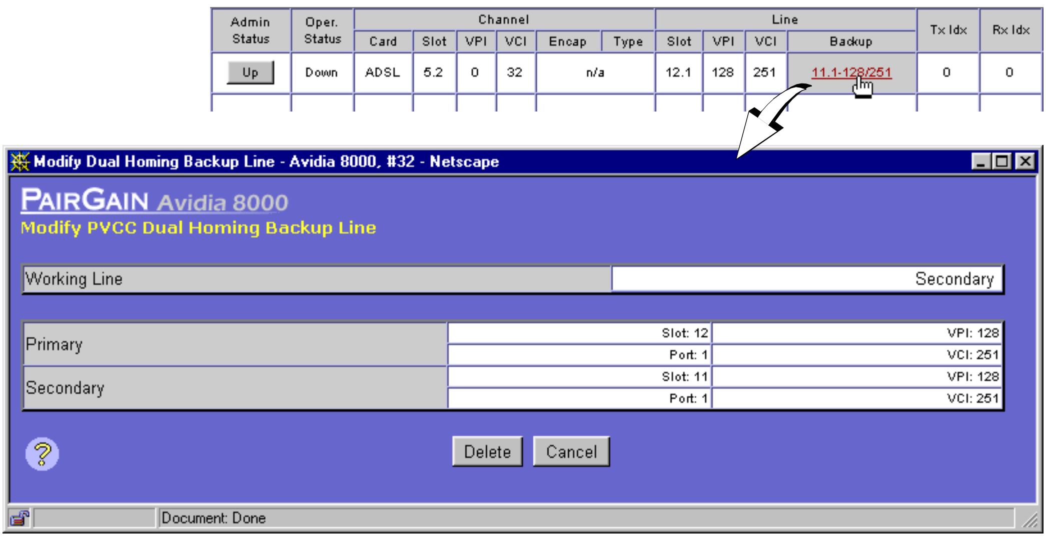
See page 443 to open the **PVCC Configuration Table** window, then restore service to the primary PVCC.

**1** Locate the table row that contains the primary PVCC that has switched to a backup PVCC.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Under **Backup** for the backup PVCC for which you want to return service to the Primary PVCC, click the **Backup** value.

The following **Modify PVCC Dual Homing Backup Line** window displays. The working line indicates that the **Secondary** or backup PVCC is active.



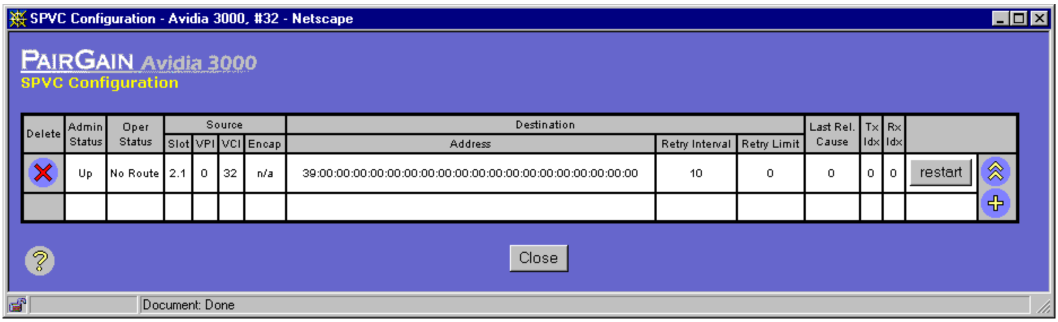

**3** Click **Restore** to return service to the primary PVCC.

# Configuring SPVCs

SPVCs (Soft Permanent Virtual Circuits) provide a PVC between the CPE and the line card, and an SVC (Switched Virtual Circuit) between the line card and the destination ATM end system. SVCs are virtual connections that are established through an ATM network using signaling (the end-points are defined when the call is initiated and terminated at the end of the call). SPVCs, then, enable ATM connection redundancy between the line card and the ATM end system.

You configure SPVCs from the **SPVC Configuration** window. Do one of the following to open the **SPVC Configuration** window:

- In the **Site Map Navigation** window, click **SPVC Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **ATM**, **SPVC Configuration**.



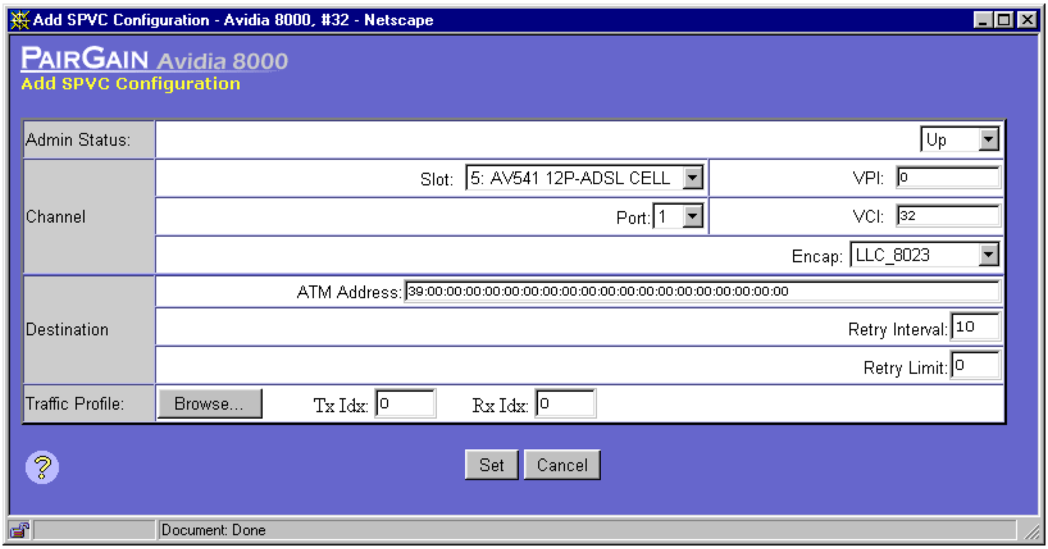
Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table. The SPVC Configuration table displays the following information for each SPVC.

| Information | Description |
|---|---|
| Admin Status | The SPVC administrative status. Options:<br>• Up—activated<br>• Down—deactivated |
| Oper Status | The SPVC operational status. Options:<br>• In Progress—attempting to connect<br>• Connected—operational<br>• Retries Exhausted—not operational |
| Source Slot | The channel card slot number. |
| Source VPI | The VPI of the PVCC between the CPE and the line card. |
| Source VCI | The VCI of the PVCC between the CPE and the line card. |
| Source Encap | The PVCC encapsulation type (applies to frame channel cards only). Options:<br>• LLC_8023<br>• VC_MUX_8023 |
| Destination Address | The ATM address of the destination ATM end system. |
| Destination Retry Interval | The number of seconds the system waits before attempting to re-establish the SPVC after a failed call attempt (range: 0 to 3600). |
| Destination Retry Limit | The maximum allowable number of unsuccessful call setup attempts (range: 0 to 65535). |
| Last Rel. Cause | The reason the SPVC was last disabled. This displays as a numeric code. See “SPVC Last Release Cause Codes” on page 607 for code definitions. |
| Tx Idx | The traffic descriptor profile index assigned to the SPVC transmitted traffic. |
| Rx Idx | The traffic descriptor profile index assigned to the SPVC received traffic. |

## Adding SPVCs

**1** In the **SPVC Configuration** window, click .

The **Add SPVC Configuration** window displays.




**2** In the **Admin Status** box, select **Up** to activate the SPVC or select **Down** to deactivate it.

**3** In the **Channel Slot** and **Port** boxes, select the channel card slot and port.

**4** In the **Channel VPI** and **VCI** boxes, type the VPI and VCI of the PVCC between the CPE and the line card.

**5** If the PVCC uses a frame channel card, in the **Channel Encap** box select the Encapsulation mode (options: **LLC_8023** or **VC_MUX_8023**).

**6** In the **Destination ATM Address** box, type the ATM address of the destination ATM end system.

The address can be up to 20 octets. The first octet must be 39, 45, or 47. Each octet must be separated by a colon.

**7** In the **Destination Retry Interval** box, type a retry interval value between 0 and 3600.

The retry interval is the number of seconds the system waits before reattempting to establish the SPVC after a failed call attempt.

8 In the **Destination Retry Limit** box, type a retry limit value between 0 and 65535.

The retry limit is the maximum number of allowable unsuccessful call setup attempts.

9 In the **Tx Idx** box, type the traffic descriptor profile index to assign to transmitted traffic.

To view the **ATM Traffic Descriptor Configuration Table**, click **Browse**.

10 In the **Rx Idx** box, type the traffic descriptor profile index to assign to received traffic.

To view the **ATM Traffic Descriptor Configuration Table**, click **Browse**.

11 Click **Set** to save the SPVC configuration, otherwise click **Cancel**.

### Deleting SPVCs

1 In the **SPVC Configuration** window, locate the table row that contains the entry you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

2 Click next to the row that contains the information you want to delete.

A confirmation dialog displays.

3 Do one of the following:

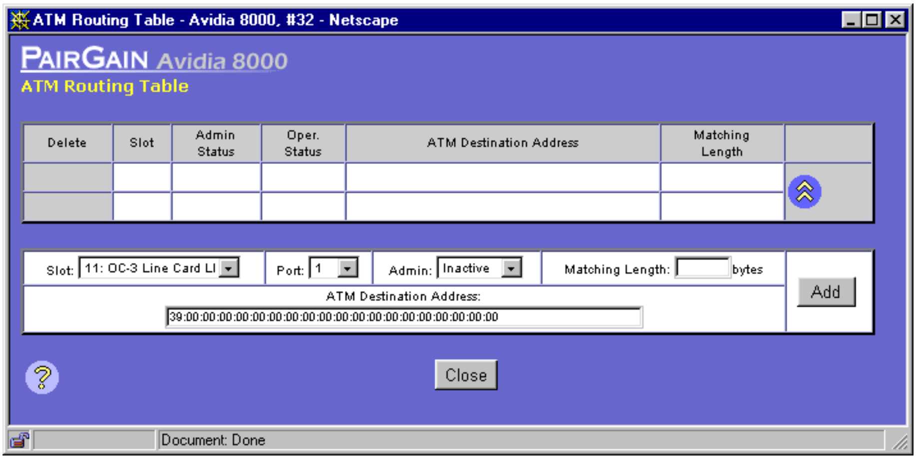
- Click **Delete** to delete the selected table entry, then in the confirmation dialog click **Back** to return to the **SPVC Configuration** window.
- Click **Cancel** to return to the **SPVC Configuration** window without deleting the table entry.

## CONFIGURING ATM ROUTING

If an Avidia system has two line cards installed, you can configure IISP (Interim Inter-Switch Signaling Protocol) static routes to provide line card redundancy. IISP enables static routing of signaling messages between clustered AVIDIA systems. When a line card fails, the system uses the IISP static route configuration to reroute SPVCs to another line card.

You configure ATM Routing from the **ATM Routing Table** window. Do one of the following to open the **ATM Routing Table** window:

- In the **Site Map Navigation** window, click **Routing Table**.
- In the **Tree Navigation** window, click **Configuration Management**, **ATM**, **Routing Table**.




Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table. The ATM Routing table displays the following information.

| Information | Description |
|---|---|
| Slot | The line card slot to which you want to route the traffic when the current line card fails. |
| Admin Status | The static route administrative status. Options:<br>• Active<br>• Inactive |
| Oper Status | The static route operational status. Options:<br>• Active—passing data.<br>• Inactive—not operational. |
| ATM Destination Address | The destination ATM address of the static route. |
| Matching Length | The number of ATM Destination Address Prefix octets the system considers when determining whether the ATM Routing Table entry matches a particular SPVC. |

## Adding ATM Routing Table Entries

**1** In the **ATM Routing Table** window **Slot** and **Port** boxes, select the line card slot to which you want to route traffic when the current line card fails.

**2** In the **Admin** box, select **Active** to activate the static route or select **Inactive** to deactivate it.

**3** In the **Matching Length** box, type the number of ATM Destination Address Prefix octets you want the system to consider when determining whether the ATM Routing Table entry matches a particular SPVC.

**4** In the **ATM Destination Address** box, type the destination ATM address for the static route.

The address can be up to 20 octets. The first octet must be 39, 45, or 47. Each octet must be separated by a colon.

**5** Click **Add** to save the **ATM Routing Table** entry, otherwise click **Cancel**.

## Deleting ATM Routing Table Entries

**1** In the **ATM Routing Table** window, locate the table row that contains the entry you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Select the Delete check box next to the table row you want to delete.

Click **Check All** to select the Delete check box for all table rows, or click **Clear All** to clear the Delete check box for all table rows.

**3** Click **Delete Selected Entry(ies)** to delete the selected table rows.

A confirmation dialog displays.

**4** Click **OK** to delete the selected table rows, otherwise click **Cancel**.

# CONFIGURING ATM INTERFACE INFORMATION

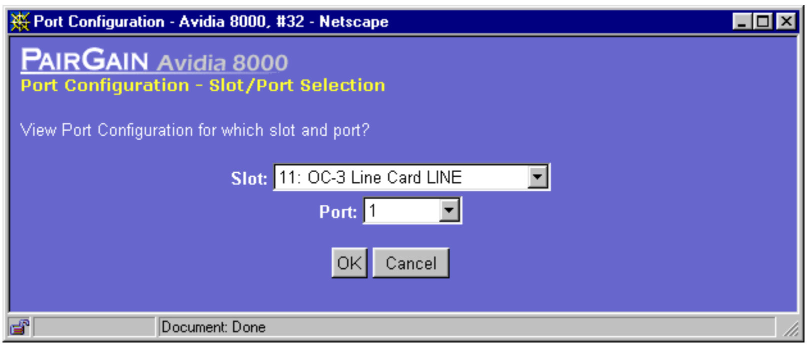
The **ATM System Interface** window displays the ATM System Prefix for the Avidia system as well as ATM interface information for the selected line card. The ATM interface parameters are initially set to default values, however you can modify the parameters.

You configure ATM interface information in the **ATM System Interface** window.

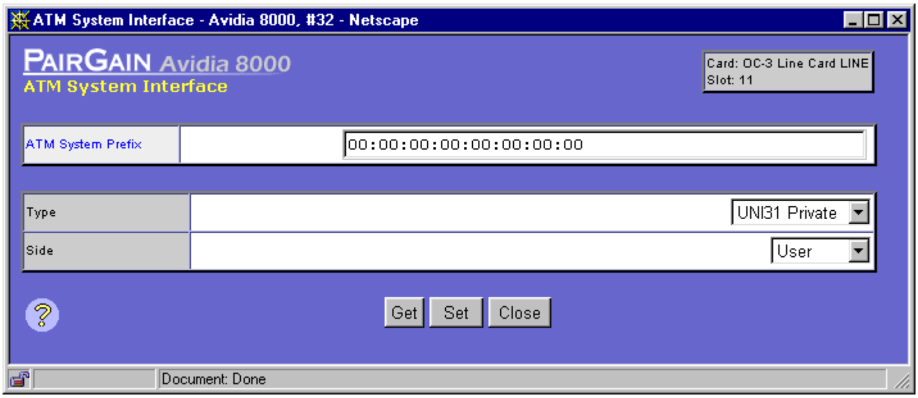
**1** Do one of the following:

- In the **Site Map Navigation** window, click **System Interfaces**.
- In the **Tree Navigation** window, click **Configuration Management**, **ATM**, **ATM System Interface**.

The to open the **ATM System Interface - Slot Selection** window displays.




**2** Select the **Slot** for the line card you want to configure and click **OK** to display the **ATM System Interface** window.




3 In the **ATM System Prefix** box, type the ATM prefix for the entire Avidia system, from 0 to 19 octets.

4 Use the Type box to select the type of ATM interface for the selected card:

- **IISP Private**—an interface between two Avidia systems that uses IISP static routes for line card redundancy.
- **UNI31 Private**—an interface between Avidia systems or between an Avidia system and a modem.
- **UNI31 Public**—an interface between the Avidia system and an ATM network switch.

5 In the **Side** box, select the side of the connection the ATM interface is located, either **User** or **Network**.

6 Do one of the following:

- To activate the settings and close the **ATM System Interface** window, click **Set**, then in the confirmation dialog, click **Back**.
- To cancel the settings and close the **ATM System Interface** window, click **Cancel**.

# Configuring ATM Policing

Policing, or UPC, enables you to specify whether traffic must conform to the configured traffic contract. When policing is enabled, traffic that does not conform to the contract is deleted. You can enable or disable policing by:

- ATM port
- PVCC
- PVPC

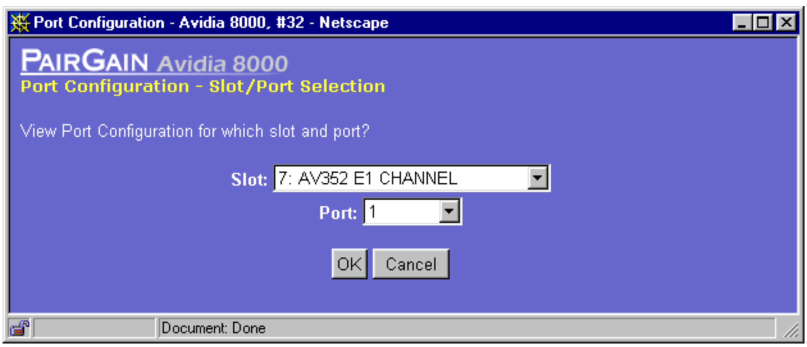
The following sections describe how to configure these types of policing

## ATM Port Policing

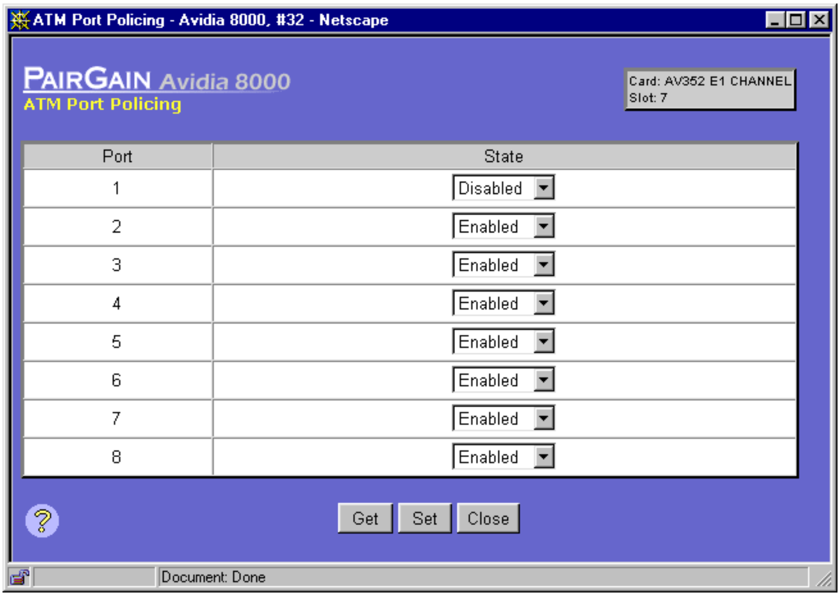
You configure ATM port policing from the **ATM Port Policing** window.

1 Do one of the following to open the **ATM Port Policing - Slot Selection** window:

- In the **Site Map Navigation** window, click **ATM Port Policing**.
- In the **Tree Navigation** window, click **Configuration Management**, **ATM Policing**, **ATM Port Policing**.




2 Select the slot for which you want to configure ATM port policing, then click **OK** to display the **ATM Port Policing** window.




3 For each physical port, in the **State** box select **Enabled** or **Disabled** to enable or disable all policing on the corresponding ATM port.

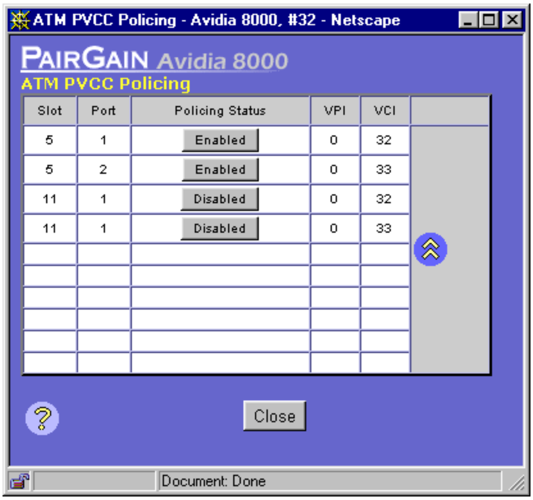
4 Do one of the following:

- To activate the settings and close the **ATM Port Policing** window, click **Set,** then in the confirmation dialog click **Back**.
- Click **Get** to cancel the new settings. You can only cancel the new settings if you have not clicked **Set**.

# PVCC Policing

You configure PVCC policing from the **ATM PVCC Policing** window. Do one of the following to open the **ATM PVCC Policing** window:

- In the **Site Map Navigation** window, click **PVCC Policing**.
- In the **Tree Navigation** window, click **Configuration Management**, **ATM Policing**, **ATM PVCC Policing**.

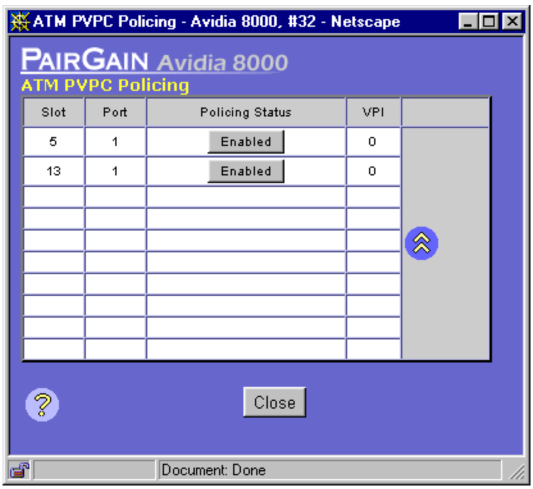



Click and if necessary to view the entire **ATM PVCC Policing Table**. displays the beginning of the table. displays the next page of the table. To change the current policing status of a PVCC, click the button in the corresponding **Policing Status** box. The button toggles between **Enabled** and **Disabled**.

## PVPC Policing

You configure PVPC policing from the **ATM PVPC Policing** window. Do one of the following to open the **ATM PVPC Policing** window:

- In the **Site Map Navigation** window, click **PVPC Policing**.
- In the **Tree Navigation** window, click **Configuration Management**, **ATM Policing**, **ATM PVPC Policing**.




Click and if necessary to view the entire **ATM PVPC Policing Table**. displays the beginning of the table. displays the next page of the table. To change the current policing status for a PVPC, click the button in the corresponding **Policing Status** box. The button toggles between **Enabled** and **Disabled**.

# CONFIGURING FRAME RELAY INTERWORKING 23

This chapter describes how to configure frame relay from the Web interface.

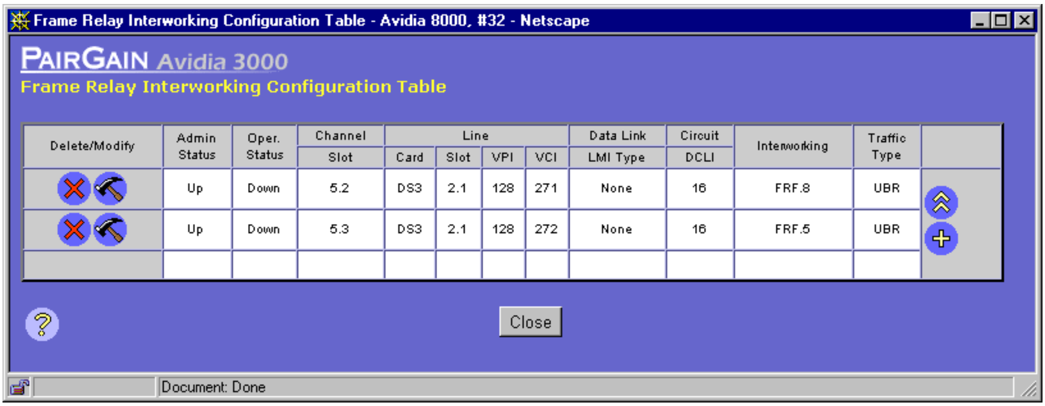
# THE FRAME RELAY INTERWORKING CONFIGURATION TABLE

You configure frame relay from the **Frame Relay Interworking Configuration Table** window.

Do one of the following:

- In the **Site Map Navigation** window, click **Frame Relay**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Frame Relay**.

The **Frame Relay Interworking Configuration Table** window displays the frame relay interworking configurations. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.



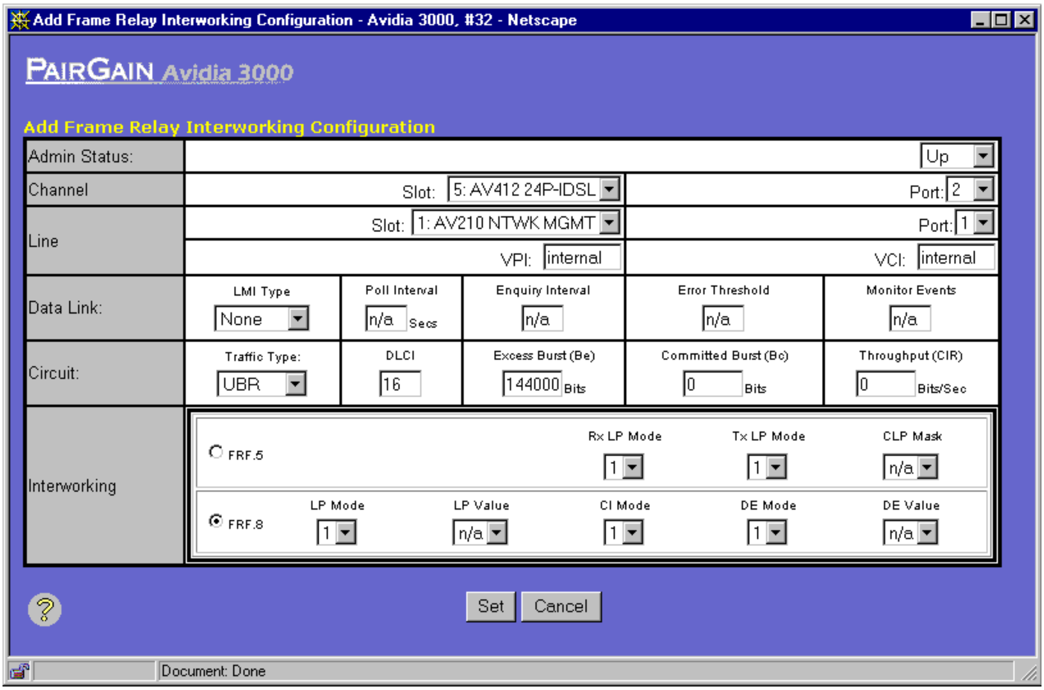
The **Frame Relay Interworking Configuration Table** window displays the operating status and a subset of the frame relay parameters set using the **Add Frame Relay Interworking Configuration** window.

| Status Box | Description |
|---|---|
| Admin Status | The administrative status of the frame channel card and line card connection: Up (activated) or Down (deactivated). |
| Oper. Status | The operating status of the frame channel card and line card connection (Up or Down). |
| Channel Slot | The frame card slot and port number in the format *slot.port*. For example, slot 4 port 1 would be 4.1. |
| Line Card | The type of line card. |
| Line Slot | The line card slot and port number in the format *slot.port*. |
| Line VPI | The fr VPI of the fr VCC between the frame channel card and the line card. |
| Line VCI | The fr VCI of the fr VCC between the frame channel card and the line card. |
| Data Link LMI Type | The Local Management Interface type (None, Rev-1, Annex A, or Annex D). |
| Circuit DLCI | The Data Link Connection Identifier (range: 16-991). |
| Interworking | The frame relay interworking standard (FRF.5 or FRF.8) |
| Traffic Type | The traffic class (UBR, CBR, rt-VBR, or nrt-VBR). |

# ADDING A FRAME RELAY CONFIGURATION

You add a frame relay configuration from the **Frame Relay Interworking Configuration Table** window.

1 In the **Frame Relay Interworking Configuration Table** window, click . The **Add Frame Relay Interworking Configuration** window displays.




2 In the **Admin Status** box, select **Up** to activate the frame channel card and line card connection or **Down** to deactivate it.

3 In the **Channel** row, do the following:

   **a** In the **Slot** box, select the slot of the frame card.

   **b** In the **Port** box, select the port of the frame card.

**4** In the **Line** row, do the following:

**a** In the **Slot** box, select the slot of the line card.

**b** In the **Port** box, select the port of the line card.

**c** In the **VPI** box, type the frame relay (fr) VPI of the fr VCC between the frame channel card and the line card.

**d** In the **VCI** box, type the fr VCI of the fr VCC between the frame channel card and the line card.

**5** In the **Data Link** row, do the following:

**a** In the **LMI Type** box, select the Local Management Interface type.

The LMI type defines a method of exchanging status information between the customer device and the network. The following LMI Types are supported:

**None**—no LMI support

**Rev-1**—LMI Rev-1

**Annex A**—ITU 0.933 Annex-A

**Annex D**—ANSI T1 617 Annex-D

**If LMI Type is set to None, Poll Interval, Inquiry Interval, Error Threshold, and Monitor Events are not used.**

**b** In the **Poll Interval** box, type the poll interval value in seconds. The valid range is 5 to 30, with 10 as the default.

Poll Interval is the number of seconds between LMI status inquiry messages.

**c** In the **Inquiry Interval** box, type the inquiry interval value. The valid range is 1 to 255, with 6 as the default.

Inquiry Interval is the number of poll intervals before a full status inquiry message is sent.

**d** In the **Error Threshold** box, type the error threshold value. The valid range is 1 to 10, with 3 as the default.

Error Threshold is the number of consecutive poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down.

**e** In the **Monitor Events** box, type the monitor events value. The valid range is 1 to 10, with 4 as the default.

Monitor Events is the number of poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down.

**6** In the **Circuit** row, do the following:

**a** In the **Traffic Type** box, select the traffic class.

**UBR** (Unspecified Bit Rate)—This is a best-effort class of traffic that is best suited for LAN. When network congestion occurs, the data is stored in a buffer until it can be sent.

**CBR** (Constant Bit Rate)—This traffic class carries a guaranteed constant bandwidth. It is best suited for applications that require fixed bandwidth, such as uncompressed voice, video, and circuit emulation. CBR is a Quality of Service class defined by the ATM Forum for ATM network.

**rt-VBR** (real-time Variable Bit Rate)—This traffic class carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video which require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.

**nrt-VBR** (non-real-time Variable Bit Rate)—This traffic class carries variable bandwidth. It is well suited for data services such as frame relay over ATM which requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.

**b** In the **DLCI** box, type the data link connection identifier. The valid range is 16 to 991, with 16 as the default.

The DLCI is the logical channel a data frame travels from the transmitted device to the destination device.

**c** In the **Excess Burst** box, type the excess burst value in data bits. The valid range is 0 to 144000, with 144000 as the default.

Excess Burst is the maximum number of uncommitted data bits that the network will attempt to deliver.

**d** In the **Committed Burst** box, type the committed burst value in data bits. The valid range is 0 to 144000, with 0 as the default.

Committed Burst is the maximum number of data bits that the network will transfer under normal conditions during the measurement interval.

**e** In the **Throughput** box, type the throughput value in seconds. The valid range is 0 to 144000, with 0 as the default.

Throughput is the average number of data bits transferred per second across the network interface in one direction.

**7** In the **Interworking** section, select the frame relay interworking standard (**FRF.5** or **FRF.8**).

Frame relay interworking allows frames to be transported by an ATM network to an ATM device or another frame relay device. There are two standards for interworking:

- **FRF.5** defines how frames are encapsulated so that they can be carried by the ATM network to another frame device. If you select this option, proceed to Step 8.
- **FRF.8** defines how frames are translated between ATM and frame devices. If you select this option, skip to Step 9.

**8** If you selected Interworking **FRF.5**, do the following:

**a** In the **Rx LP Mode** box, select the Rx LP mode (**1** or **2**).

The Rx LP mode determines the loss priority settings when transmitting from ATM to frame relay.

**1**—The frame relay header DE field is set if the CLP field of one or more ATM cells of a frame is set to 1 or if the FR-SSCS PDU header DE field is set to 1.

**2**—The frame relay header DE field is copied into the FR-SSCS PDU header DE field, independent of the ATM CLP field value received.

**b** In the **Tx LP Mode** box, select the Tx LP Mode (**1** or **2**).

The Tx LP mode determines the content of the FR-SSCS PDU header DE and ATM cell ATM CLP fields.

**1**—The frame header DE field is copied in the FR-SSCS PDU header DE field and mapped into the ATM CLP field of every ATM cell generated by the frame.

**2**—The frame header DE field is copied into the FR-SSCS PDU header DE field. The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the CLP Mask value.

**c** In the **CLP Mask** box, select the mask used when **Tx LP Mode** is set to **2** (**0** or **1**).

The CLP Mask determines the content of the ATM cell CLP field when **Tx LP Mode** is set to **2**.

**0**—The network cannot discard cells.

**1**—The network can discard cells.

**9** If you selected Interworking **FRF.8**, do the following:

**a** In the **LP Mode** box, select the **LP Mode** (**1** or **2**).

The LP Mode determines the content of the ATM CLP field when translating from frame relay to ATM.

**1**—The frame relay header DE field is mapped into the ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information for that frame.

**2**—The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the **LP Value**.

**b** In the **LP Value** box, select the value used when **LP Mode** is set to **2** (**0** or **1**).

The LP Value determines the content of the ATM cell CLP field when **LP Mode** is set to **2**.

**0**—The network cannot discard cells.

**1**—The network can discard cells.

**c** In the **CI Mode** box, select the **CI Mode** (**1** or **2**).

The CI Mode determines the content of the ATM EFCI field.

**1**—The frame relay FECN field is mapped to the ATM EFCI field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame. This mode provides congestion indication to the end points, where higher-level protocol entries might be involved in traffic control mechanisms.

**2**—The ATM EFCI field is set to "congestion not experienced."

**d** In the **DE Mode** box, select the **DE Mode** (**1** or **2**).

The DE Mode determines the content of the frame relay DE field when transmitting from ATM to frame relay.

**1**—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set.

**2**—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set to the **DE Value**.

**e** In the **DE Value** box, select the value used when **DE Mode** is set to **2** (**0** or **1**).

The DE Value determines the content of the frame relay DE field when **DE Mode** is set to **2**.

**0**—The network cannot discard frames.

**1**—The network can discard frames.

**10** Do one of the following:

- To save the frame relay configuration click **Set**, then in the confirmation dialog click **Back** to return to the **Frame Relay Interworking Configuration Table** window.
- To cancel the configuration and return to the **Frame Relay Interworking Configuration Table** window, click **Cancel**.

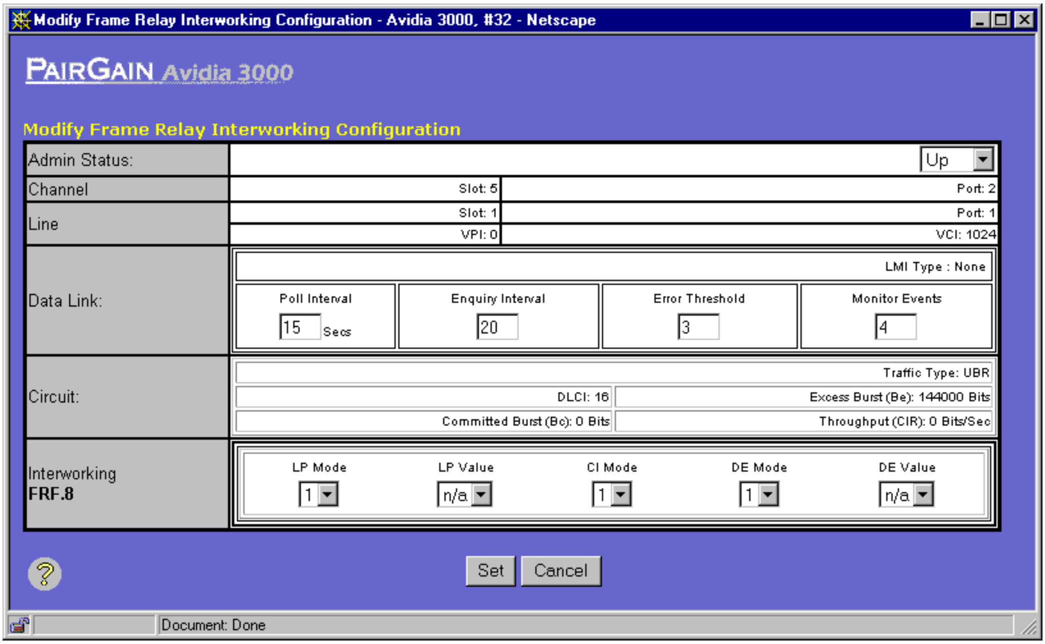
# MODIFYING A FRAME RELAY CONFIGURATION

You modify a frame relay configuration from the **Frame Relay Interworking Configuration Table** window. You can only modify the parameters appropriate for the existing configuration. For example, if FRF.8 is the interworking standard, you cannot select FRF.5. Other parameters, such those for channel, line, and circuit, display for your reference.

**1** In the **Frame Relay Interworking Configuration Table** window, locate the table row that contains the frame relay interworking configuration you want to modify.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Click next to the row that contains the information you want to modify. The **Modify Frame Relay Interworking Configuration** window displays.




3 To modify the administrative status, in the **Admin Status** box select the desired setting (**Up** to activate the frame channel card and line card connection or **Down** to deactivate it).

4 In the **Data Link** row, unless **LMI Type** is set to **None** you can do the following:

  **a** To modify the poll interval value, in the **Poll Interval** box type the value in seconds. The valid range is 5 to 30, with 10 as the default.

  **b** To modify the inquiry interval value, in the **Inquiry Interval** box type the value. The valid range is 1 to 255, with 6 as the default.

  **c** To modify the error threshold, in the **Error Threshold** box type the value. The valid range is 1 to 10, with 3 as the default.

  **d** To modify the monitor events value, in the **Monitor Events** box type the value. The valid range is 1 to 10, with 4 as the default.

5 If **Interworking FRF.5** displays, you can do the following:

  **a** To modify the Rx LP mode, in the **Rx LP Mode** box select the desired setting (**1** or **2**).

  **b** To modify the Tx LP mode, in the **Tx LP Mode** box select the desired setting (**1** or **2**).

  **c** To modify the CLP mask, in the **CLP Mask** box select the mask used when **Tx LP Mode** is set to **2** (**0** or **1**).

**6** If **Interworking FRF.8** displays, you can do the following:

   **a** To modify the LP Mode, in the **LP Mode** box select the desired setting (**1** or **2**).

   **b** To modify the LP Value. in the **LP Value** box select the value used when **LP Mode** is set to **2** (**0** or **1**).

   **c** To modify the CI Mode, in the **CI Mode** box select the desired setting (**1** or **2**).

   **d** To modify the DE Mode, in the **DE Mode** box select the desired setting (**1** or **2**).

   **e** To modify the DE Value, in the **DE Value** box select the value used when **DE Mode** is set to **2** (**0** or **1**).

**7** Do one of the following:

- To save the modified frame relay configuration click **Set**, then in the confirmation dialog click **Back** to return to the **Frame Relay Interworking Configuration Table** window.
- To cancel modifying the configuration and to return to the **Frame Relay Interworking Configuration Table** window, click **Cancel**.

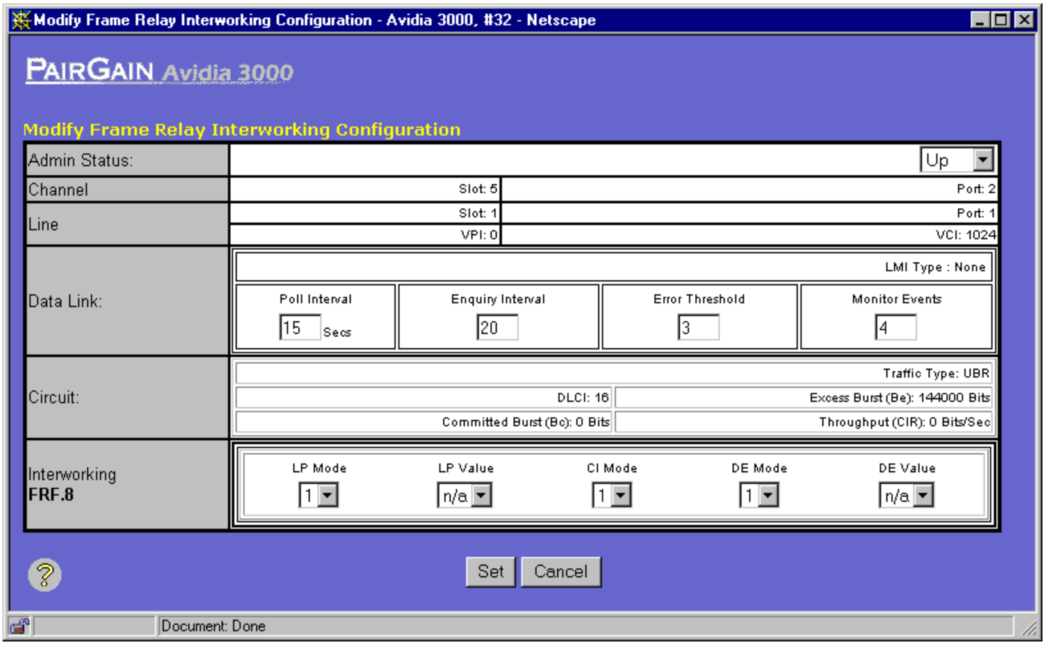
# Viewing an Entire Frame Relay Configuration

You view an entire frame relay configuration from the **Modify Relay Interworking Configuration Table** window.

**1** In the **Frame Relay Interworking Configuration Table** window, locate the table row that contains the frame relay interworking configuration you want to view.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Click next to the row that contains the information you want to view. The **Modify Frame Relay Interworking Configuration** window displays.



| Status Box | Description |
|---|---|
| Admin Status | The administrative status of the frame channel card and line card connection: Up (activated) or Down (deactivated). |
| Channel Slot | The frame card slot number. |
| Channel Port | The frame card port number. |
| Line Slot | The line card slot number. |
| Line Port | The line card port number. |
| Line VPI | The fr VPI of the fr VCC between the frame channel card and the line card. |
| Line VCI | The fr VCI of the fr VCC between the frame channel card and the line card. |
| Data Link LMI Type | The Local Management Interface type, which defines a method of exchanging status information between the customer device and the network. The options are:<br>None—no LMI support<br>Rev-1—LMI Rev-1<br>Annex A—ITU 0.933 Annex-A<br>Annex D—ANSI T1 617 Annex-D<br>If the LMI type is set to None, the poll interval, inquiry interval, error threshold, and monitor events parameters are not used. |
| Data Link Poll Interval | The poll interval value, which is the number of seconds between LMI status inquiry messages (range: 5-30). |
| Data Link Inquiry Interval | The inquiry interval value, which is the number of poll intervals before a full status inquiry message is sent (range: 1-255). |
| Data Link Error Threshold | The error threshold value, which is the number of consecutive poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down (range: 1-10). |
| Data Link Monitor Events | The monitor events value, which is the number of poll intervals in which the LMI status inquiry messages are not received that are required for the link to be declared down (range: 1-10). |

| Status Box | Description |
|---|---|
| Circuit Traffic Type | The type determines the traffic class.<br>ubr (Unspecified Bit Rate)—This is a best-effort class of traffic that is best suited for LAN. When network congestion occurs, the data is stored in a buffer until it can be sent.<br>cbr (Constant Bit Rate)—This traffic class carries a guaranteed constant bandwidth. It is best suited for applications that require fixed bandwidth, such as uncompressed voice, video, and circuit emulation. CBR is a Quality of Service class defined by the ATM Forum for ATM network.<br>nrt-vbr (non-real-time Variable Bit Rate)—This traffic class carries variable bandwidth. It is well suited for data services such as frame relay over ATM which requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size.<br>rt-vbr (real-time Variable Bit Rate)—This traffic class carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video which require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size. |
| Circuit DLCI | The Data Link Connection Identifier (range: 16-991). |
| Circuit Excess Burst | The Excess Burst value, which is the maximum number of uncommitted data bits that the network will attempt to deliver (range: 0-144000). |
| Circuit Committed Burst | The Committed Burst value, which is the maximum number of data bits that the network agrees to transfer under normal conditions during the measurement interval (range: 0-144000). |
| Circuit Throughput | The circuit Throughput (committed information rate) value in seconds (range: 0-144000). |
| FRF.5 Rx LP Mode | The Rx LP Mode, which determines the loss priority settings when transmitting from ATM to frame relay.<br>1—The frame relay header DE field is set if the CLP field of one or more ATM cells of a frame is set to 1 or if the FR-SSCS PDU header DE field is set to 1.<br>2—The frame relay header DE field is copied into the FR-SSCS PDU header DE field, independent of the ATM CLP field value received. |

| Status Box | Description |
|---|---|
| FRF.5 Tx LP Mode | The Tx LP Mode, which determines the content of the FR-SSCS PDU header DE and ATM cell ATM CLP fields.<br>1—The frame header DE field is copied in the FR-SSCS PDU header DE field and mapped into the ATM CLP field of every ATM cell generated by the frame.<br>2—The frame header DE field is copied into the FR-SSCS PDU header DE field. The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the CLP Mask value. |
| FRF.5 CLP Mask | The CLP Mask setting, which determines the content of the ATM cell CLP field when Tx LP Mode is set to 2.<br>0—The network cannot discard cells.<br>1—The network can discard cells. |
| FRF.8 LP Mode | The LP Mode, which determines the content of the ATM CLP field when translating from frame relay to ATM.<br>1—The frame relay header DE field is mapped into the ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information for that frame.<br>2—The ATM CLP field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame is set to the LP Value. |
| FRF.8 LP Value | The LP Value, which determines the content of the ATM cell CLP field when the LP mode is set to 2.<br>0—The network cannot discard cells.<br>1—The network can discard cells. |
| FRF.8 CI Mode | The CI Mode, which determines the content of the ATM EFCI field.<br>1—The frame relay FECN field is mapped to the ATM EFCI field of every ATM cell generated by the segmentation process of the AAL5 PDU containing the information of that frame. This mode provides congestion indication to the end points, where higher-level protocol entries might be involved in traffic control mechanisms.<br>2—The ATM EFCI field is set to "congestion not experienced." |

| Status Box | Description |
|---|---|
| FRF.8 DE Mode | The DE Mode, which determines the content of the frame relay DE field when transmitting from ATM to frame relay.<br>1—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set.<br>2—If the ATM CLP field of one or more cells belonging to a frame is set, the frame relay DE field is set to the DE Value. |
| FRF.8 DE Value | The DE Value, which determines the content of the frame relay DE field when the DE Mode is set to 2.<br>0—The network cannot discard frames.<br>1—The network can discard frames. |

**3** To cancel viewing the configuration and to return to the **Frame Relay Interworking Configuration Table** window, click **Cancel**.

# DELETING A FRAME RELAY CONFIGURATION

You delete a frame relay configuration from the **Frame Relay Interworking Configuration Table** window.

**You cannot delete configurations where the Operating Status is Up.**

**1** In the **Frame Relay Interworking Configuration Table** window, locate the table row that contains the frame relay interworking configuration you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Click next to the row that contains the information you want to delete.

A confirmation dialog displays.

**3** Do one of the following:

- To delete the frame relay interworking configuration click **Delete**, then in the confirmation dialog click **Back** to return to the **Frame Relay Interworking Configuration Table** window.
- To close the confirmation dialog without deleting the profile and then return to the **Frame Relay Interworking Configuration Table** window, click **Cancel**.

# CONFIGURING BRIDGING AND ROUTING 24

This chapter describes how to create bridging and routing sessions and configure system bridging and routing parameters from the Web interface.

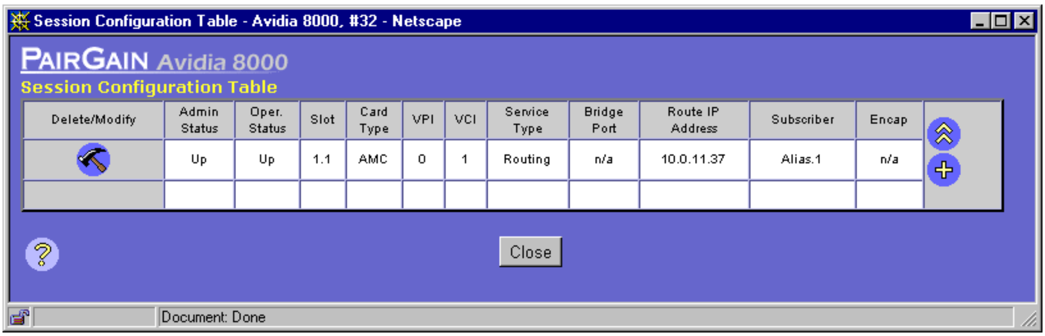
# CONFIGURING BRIDGING AND ROUTING SESSIONS

You can configure bridging and routing sessions using PVCs that terminate on the management card (for example, PVCs between ADSL cards and the management card or PVCs between OC3 line cards and the management card). You can configure 96 bridging and routing sessions.

To configure a bridging or routing session, you configure a PVC between a line or channel card and the management card, then set up the desired service for the session (bridging, routing or both). The system automatically assigns the management card VPI and VCI for each session. If you are configuring a session using an SDSL frame card, the system automatically assigns the SDSL VPI and VCI and configures the session to use VC-MUX_Bridged encapsulation mode.

You add, modify and delete sessions from the **Session Configuration Table** window. Do one of the following to open the **Session Configuration Table** window:

- In the **Site Map Navigation** window, click **Session Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Session Configuration Table**.



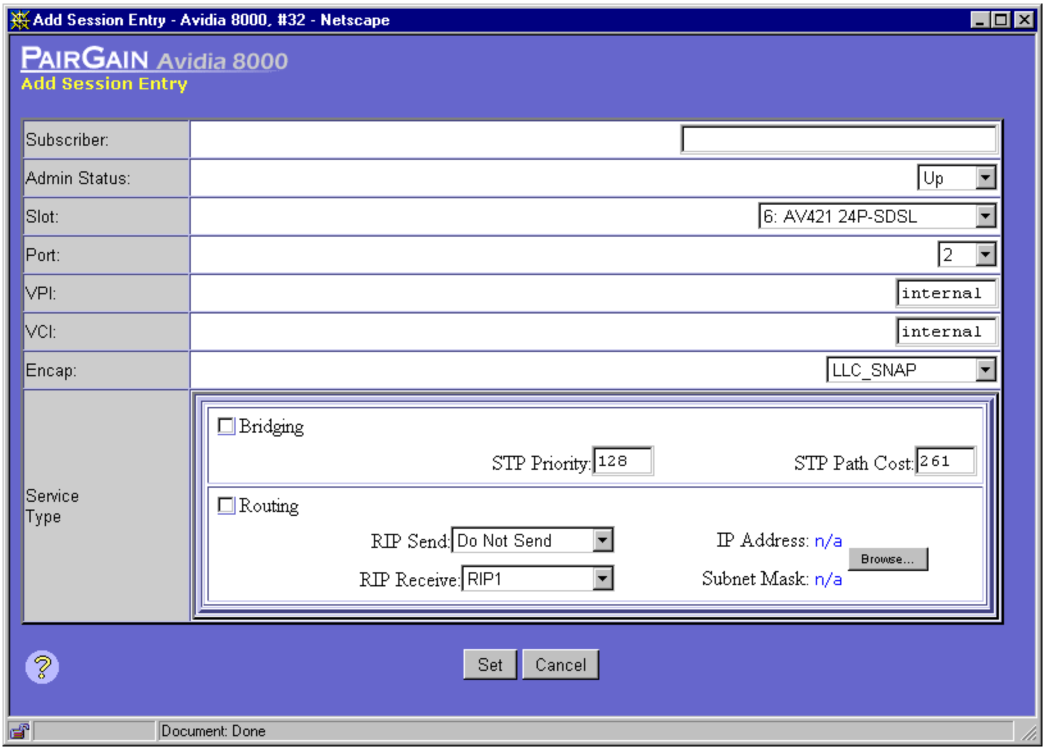
The first row of the **Session Configuration Table** displays information for a session that connects the management card to the ATM network. The VPI and VCI for this session are assigned internally. Click and if necessary to view the entire **Session Configuration Table**. displays the beginning of the table. displays the next page of the table. The **Session Configuration Table** window displays the following information:

| Information | Description |
|---|---|
| Admin Status | The configured admin status of the session.<br>• **Up** indicates the session is enabled.<br>• **Down** indicates the session is disabled. |
| Oper Status | The current operational status of the selected port.<br>• **Up** indicates the port is operational and passing data.<br>• **Down** indicates the port is not operational. |
| Slot | The slot and port of the line or channel card that is used for the session. |
| Card Type | The type of line or channel card used for the session. |
| VPI | The line or channel card VPI used for the session. |
| VCI | The line or channel card VCI used for the session. |
| Service Type | The type of service configured for the session, either **Bridging**, **Routing**, **Brouting** (bridging and routing) or **n/a**, which indicates that no service is configured. |
| Bridge Port | The index number assigned to the logical bridging port used for the session. This number is automatically assigned by the system. If bridging is not enabled, this value is **n/a**. |
| Route IP Address | The IP address of the management card logical port or WAN address used for this session (routing sessions only). If routing is not enabled, this value is **n/a**. |
| Subscriber | The subscriber name assigned to identify the session. |
| Encap | The configured encapsulation mode, either **LLC_SNAP**, **VC_MUX_Bridged** or **VC_MUX_Routed**. |

## Adding Sessions

1 In the **Session Configuration Table** window, click .

The **Add Session Entry** window displays.




2 In the **Subscriber** box, type a name to identify this session.

3 In the **Admin Status** box, select **Up** or **Down**.

**Up** enables the session. **Down** disables the session.

4 In the **Slot** and **Port** boxes, select the line or channel card slot and port you want to use for this session.

5 If you selected an SDSL card in Step 4, go to Step 8.

6 In the **VPI** and **VCI** boxes, type the line or channel card VPI and VCI you want to use for this session PVC.

**7** In the **Encap** box, select the type of encapsulation you want to use for this session PVC (**LLC_SNAP**, **VC_MUX_Routed** or **VC_MUX_Bridged**).

The type of service you specify in Step 8 determines the appropriate encapsulation modes. In addition, the encapsulation mode must match the encapsulation mode used by the adjacent segments in the network. The encapsulation mode is automatically set to **VC_MUX_Bridged** for PVCs that use SDSL cards, and cannot be modified. Use the following table to determine the encapsulation mode.

| If you specified service type: | Set the encapsulation mode to: |
|---|---|
| broute | llc-snap |
| route | llc-snap or vcmuxrt |
| bridge | vcmuxbr or llc-snap |

**8** In the **Service Type** box, select the **Bridging** or the **Routing** checkbox, or both, to specify the type of service(s) for this session.

**9** If you selected **Bridging** in Step 8, do the following:

**a** In the **STP Priority** box, type a number to indicate the Spanning Tree Protocol priority for the session. The default range is from 0 to 255, with 0 being the highest priority. The default value is 128.

**b** In the **STP Path Cost** box, type a number to indicate the efficiency of the session. The valid range is from 1 to 65535. The value 1 is the lowest cost, reflecting the greatest efficiency. The default value is 250 for WAN ports and 100 for LAN ports.

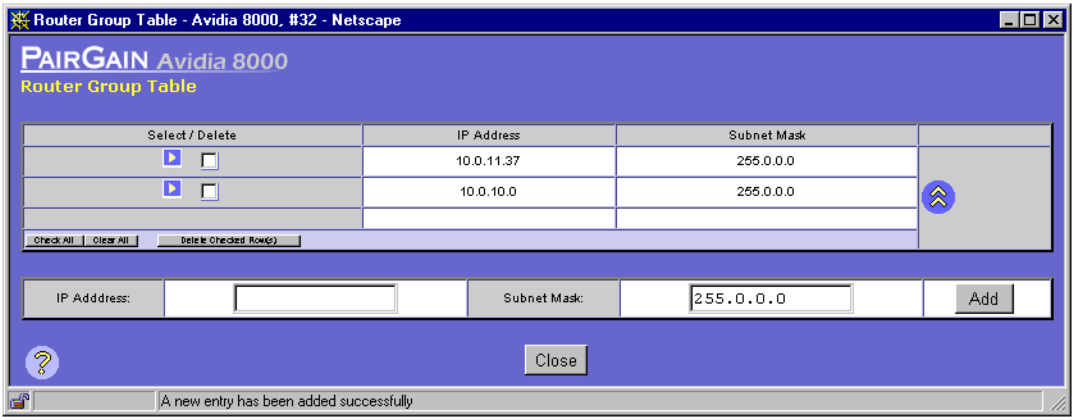
**10** If you selected **Routing** in Step 8, do the following:

**a** In the **RIP Send** box, select the desired type of RIP packets to be sent (**Do Not Send** RIP packets, **RIP Version1**, **RIP 1 Compatible** (RIP2-type packets that are compatible with RIP 1), or **RIP Version2**).

The RIP type is determined by the RIP version used by the other routers in the network.

**b** In the **RIP Receive** box, select the desired type of RIP packets to be received (**RIP1**, **RIP2**, **RIP 1 or RIP2**, or **Do Not Receive** RIP packets).

**c** Click **Browse** to display the **Router Group Table** window.




**d** Click  to select the router group that contains the IP address and subnet mask you want to assign to this session (see “Configuring Router Groups” on page 493 for information on Router Groups). The **Router Group Table** window closes and the selected IP address and subnet masks are assigned to the session.

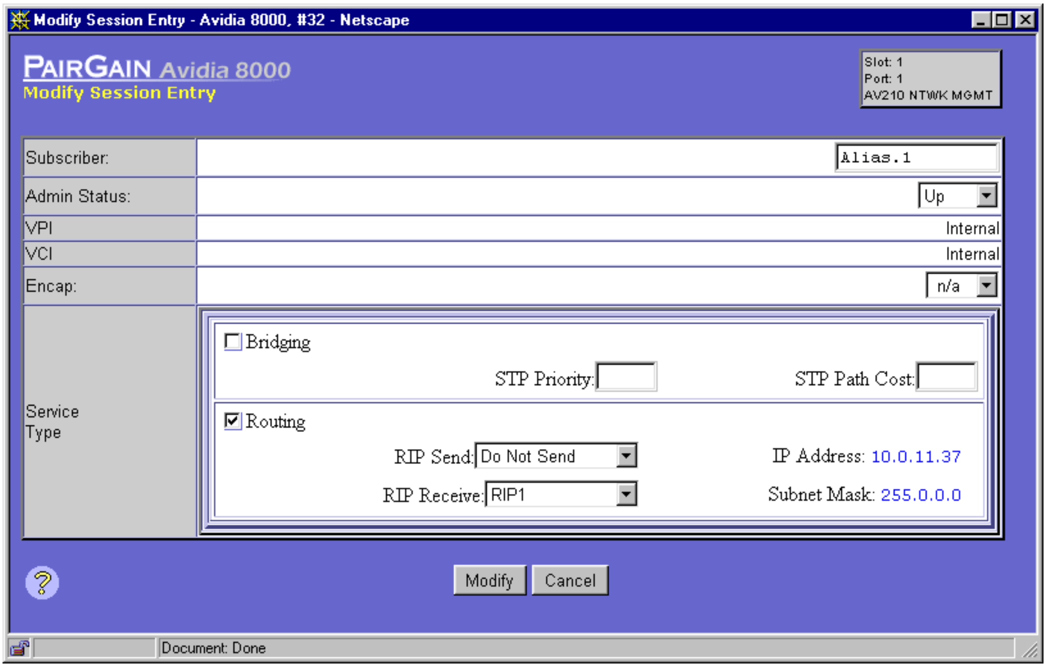
**11** Do one of the following:

- To activate the settings and close the **Add Session Entry** window, click **Set**, then in the confirmation dialog click **Back**.
- To cancel the settings and close the **Add Session Entry** window, click **Cancel**.

## Modifying Sessions

**1** In the **Session Configuration Table** window, click next to the session you want to modify.

The **Modify Session Entry** window displays.




**2** To modify the subscriber name, type a name in the **Subscriber** box to identify this session.

**3** To modify the admin status, in the **Admin Status** box, select the desired setting.

**Up** enables the session. **Down** disables the session.

**4** To modify the encapsulation mode, in the **Encap** box, select the desire setting (**LLC_SNAP**, **VC_MUX_Routed** or **VC_MUX_Bridged**).

The encapsulation mode must match the encapsulation mode used by the adjacent segments in the network. The encapsulation mode is automatically set to VC-MUX_Bridged for PVCs that use SDSL cards, and cannot be modified.

**5** To modify the service type, in the **Service Type** box, select or clear the checkbox to indicate the desired service. To configure the session for both bridging and routing, select both checkboxes.

**6** If you selected Bridging in Step 5, do the following:

   **a** In the **STP Priority** box, type a number to indicate the Spanning Tree Protocol priority for the session. The default range is from 0 to 255, with 0 being the highest priority. The default value is 128.

   **b** In the **STP Path Cost** box, type a number to indicate the efficiency of the session. The valid range is from 1 to 65535. The value 1 is the lowest cost, reflecting the greatest efficiency. The default value is 250 for WAN ports and 100 for LAN ports.

**7** If you selected Routing in Step 5, do the following:

   **a** In the **RIP Send** box, select the desired type of RIP packets to be sent (**Do Not Send** RIP packets, **RIP Version1**, **RIP 1 Compatible** (RIP2-type packets that are compatible with RIP 1), or **RIP Version2**).

   The RIP type is determined by the RIP version used by the other routers in the network.

   **b** In the **RIP Receive** box, select the desired type of RIP packets to be received (**RIP1**, **RIP2**, **RIP 1 or RIP2**, or **Do Not Receive** RIP packets).

   **c** Click **Browse** to display the **Router Group Table** window.

   **d** Click  to select the router group that contains the IP address and subnet mask you want to assign to this session. The **Router Group Table** window closes and the selected IP address and subnet masks are assigned to the session.

   **e** If a router group is currently assigned to the session, the **Browse** button will be unavailable. To modify an existing router group setting, clear the Routing checkbox to disable routing, then proceed to Step 8 to save your session information changes. After the session information is saved with routing disabled, you can then assign a router group to the session.

**8** Do one of the following:

- To activate the settings and close the **Modify Session Entry** window, click **Modify**, then in the confirmation dialog click **Back**.
- To cancel the settings and close the **Modify Session Entry** window, click **Cancel**.

## Deleting Sessions

1 Locate the table row that contains the session entry you want to delete.

Click and if necessary to view the entire **Session Configuration Table**. displays the beginning of the table. displays the next page of the table.

2 Click next to the row that contains the information you want to delete.

A confirmation dialog displays.

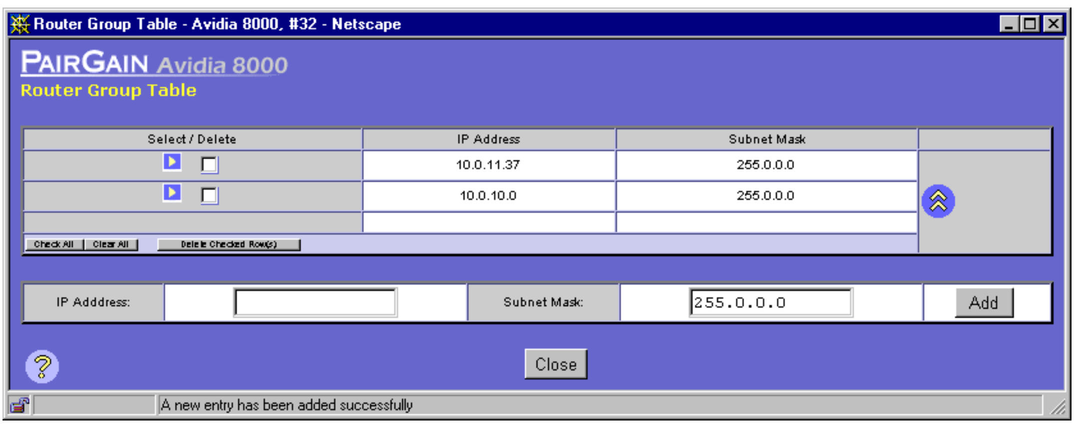
3 Do one of the following:

- Click **Delete** to delete the selected session, then in the confirmation dialog click **Back** to return to the **Session Configuration Table** window.
- Click **Cancel** to return to the **Session Configuration Table** window without deleting the session.

# CONFIGURING ROUTER GROUPS

The Router Group Table window displays the IP address and subnet mask combinations that can be assigned to the management card logical session ports when configuring routing sessions using the Web interface (this table does not exist in the command-line interface, as routing configuration is structured differently in that interface).

You add and delete router groups from the **Router Group Table** window. The Router Group Table window is opened from the **Add Session Entry** window. See "Adding Sessions" on page 488 for information on opening the **Add Session Entry** window. From the **Add Session Entry** window, click on the **Routing** checkbox, then click **Browse** to open the **Router Group Table** window.



Click and if necessary to view the entire **Router Group Table**. displays the beginning of the table. displays the next page of the table. The **Router Group Table** window displays the following information:

| Information | Description |
|---|---|
| IP Address | The IP address to assign to the logical session port. |
| Subnet Mask | The subnet mask to assign to the logical session port. |

## Adding Router Groups

**1** In the **Router Group Table** window **IP Address** box, type the IP address to assign to the router group.

**2** In the **Subnet Mask** box, type the subnet mask to assign to the router group.

**3** Click **Add** to activate the settings.

## Deleting Router Groups

**1** Locate the table row that contains the router group you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Click the **Delete** checkbox next to the row that contains the information you want to delete.

**3** Click the **Delete Checked Row(s)** button.

A confirmation dialog displays.

**4** Do one of the following:

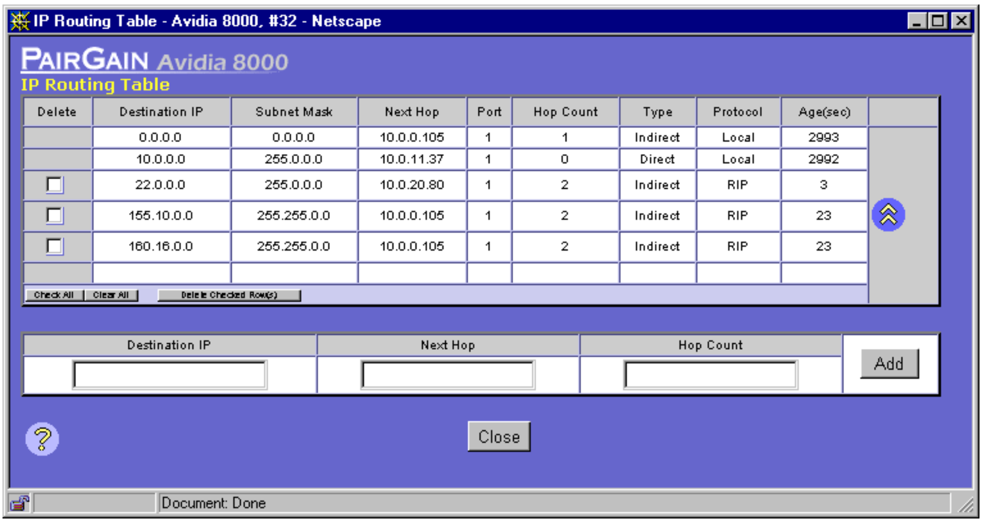
- Click **OK** in the confirmation dialog to delete the router group.
- Click **Cancel** to return to the **Router Group Table** window without deleting the router group.

# CONFIGURING IP ROUTING

The IP Routing Table contains the information that is used by the management card to route data. Packets for which the network portion of the destination IP address match the IP address listed in the first column of the table are routed based on the data displayed in the corresponding table row.

You add and delete IP Routing Table entries from the **IP Routing Table** window. Do one of the following to open the **IP Routing Table** window:

- In the **Site Map Navigation** window, click **IP Routing Table**.
- In the **Tree Navigation** window, click **Configuration Management**, **Bridge/Route**, **IP Routing Table**.



Click and if necessary to view the entire **IP Routing Table**. displays the beginning of the table. displays the next page of the table. Click **Get** to update the **IP Routing Table** data. The **IP Routing Table** window displays the following information:

| Information | Description |
|---|---|
| Destination IP | The IP address of the routing entry. |
| Subnet Mask | The subnet mask used to specify what portion of the IP address is considered when determining whether to route the packet based on the data in this table row. |
| Next Hop | The IP address of the next router in the network to which the packet is to be forwarded. |
| Port | An index number assigned by the system to the interface over which the packet is routed. The management card Ethernet port always has an index of 1. The number 2 indicates a loopback. The system assigns numbers to other interfaces, such as line and channel card interfaces. |
| Hop Count | The number of hops the packet is allowed to make to get to its destination. This value is used by the RIP. If the packet makes the maximum allowable hopes and is not yet at its destination, it is deleted. |
| Type | The type of routing connection. Options:<br>• **Indirect** (requires multiple hops)<br>• **Direct** (local connection)<br>• **Invalid** (the route is invalid)<br>• **Other** (none of the above options) |
| Protocol | The method by which the data in the **IP Routing Table** entry was learned, either **Local** (manually configured) or **RIP** (learned dynamically). |
| Age (sec) | The number of seconds the **IP Routing Table** entry has been in the table. Learned routing entries are automatically deleted once their Age exceeds the maximum, which is determined by the routing protocol. Static routes must be deleted manually. |

## Adding IP Routing Table Entries

1. In the **Destination IP** box, type the IP address of the routing entry.
2. In the **Next Hop** box, type the IP address of the next router in the network to which the packet is to be forwarded.
3. In the **Hop Count** box, type the number of hops the packet is allowed to make to get to its destination.
4. Click **Add** to activate the settings.

## Deleting IP Routing Table Entries

**1** Locate the table row that contains the IP routing entry you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Click the **Delete** checkbox next to the row that contains the information you want to delete

**3** Click the **Delete Checked Row(s)** button.

A confirmation dialog displays.

**4** Do one of the following:

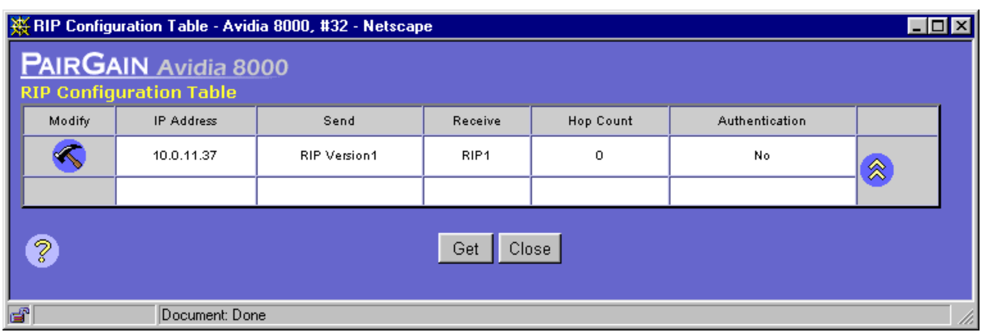
- Click **OK** to delete the selected table entry and return to the **IP Routing Table** window.
- Click **Cancel** to return to the **IP Routing Table** window without deleting the table entry.

# MODIFYING RIP CONFIGURATION

The RIP Configuration Table displays information about the Routing Information Protocol (RIP) used for each routing session. You configure RIP information initially during session configuration, however you can modify it using the following procedures.

You modify RIP information from the **RIP Configuration Table** window. Do one of the following to open the **RIP Configuration Table** window:

- In the **Site Map Navigation** window, click **RIP Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Bridge/Route**, **RIP Configuration**.



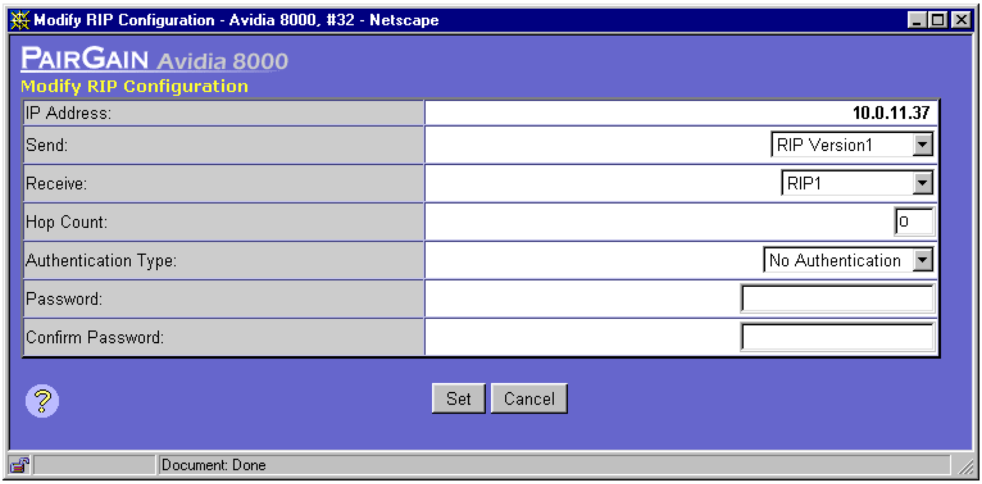
Click and if necessary to view the entire **RIP Configuration Table**. displays the beginning of the table. displays the next page of the table. The **RIP Configuration Table** window displays the following information:

| **Information** | **Description** |
|---|---|
| IP Address | The IP address of the routing session. |
| Send | The type of RIP packets to be sent. The RIP type is determined by the RIP version used by the other routers in the network. The options are:<br>• **Do Not Send** (no RIP packets are sent)<br>• **RIP Version 1**<br>• **RIP 1 Compatible** (RIP2-type packets that are compatible with RIP 1)<br>• **RIP Version 2** |
| Receive | The type of RIP packets to be received. The options are:<br>• **RIP1**<br>• **RIP2**<br>• **RIP1 or RIP2**<br>• **Do Not Receive** (no RIP packets are received) |
| Hop Count | The number of hops the packets are allowed to cross before arriving at their destination. |
| Authentication | Indicates whether a password is set to enable the router to receive routing information from the session ports in the same network segment. The options are **No** (no authentication) or **Simple Password** (text string). |

To modify RIP information:

**1** In the **RIP Configuration Table** window, click .

The **Modify RIP Configuration** window opens.




**2** To modify the Send mode in the **Send** box select the desired setting (**Do Not Send**, **RIP Version 1**, **RIP1 Compatible**, **RIP Version 2**).

**3** To modify the Receive mode, in the **Receive** box select the desire setting (**RIP 1**, **RIP 2**, **RIP 1 or RIP 2**, **Do Not Receive**).

**4** To modify the hop count, in the **Hop Count** box type the number of hops the packets are allowed to cross before arriving at their destination.

**5** To modify the authentication type, in the **Authentication Type** box, select the desired setting (**No Authentication** or **Simple Password**). You can only set the authentication type to **Simple Password** if you are using a **Send** or **Receive** mode that supports RIP 2.

The authentication type determines whether a password is required for the router to learn information from the session ports in the same network segment.

**6** If you selected **No Authentication** in Step 5, go to Step 8.

7 In the **Password** box, type the text string you want to use for a password, then in the **Confirm Password** box, re-type the text string.

The text string can be any length and can use any keyboard character.

8 Do one of the following:

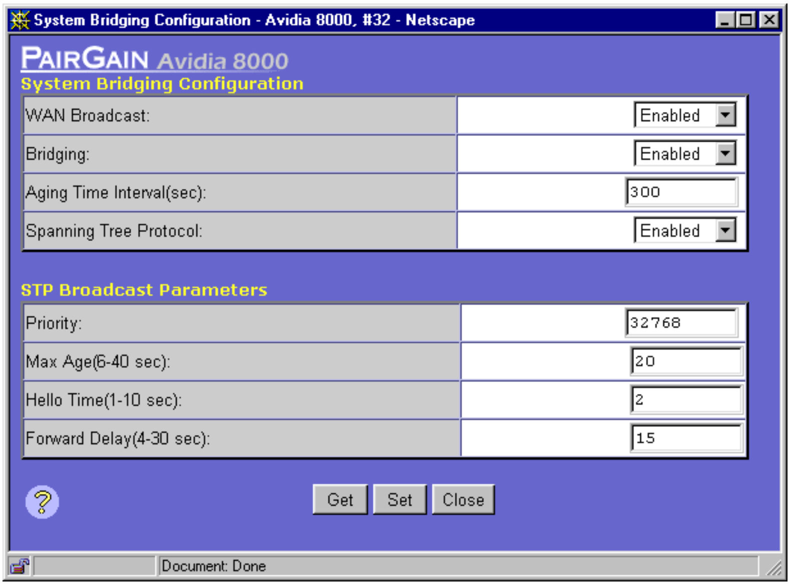
- To activate the settings and close the **Modify RIP Configuration** window, click **Set**, then in the confirmation dialog click **Back**.
- To cancel the settings and close the **Modify RIP Configuration** window, click **Cancel**.

# CONFIGURING SYSTEM BRIDGING AND STP PARAMETERS

You can configure several system-wide bridging and Spanning-Tree Protocol (STP) parameters. Each parameter comes preconfigured with a default value, however you can modify each setting.

You modify system bridging and STP parameters from the **System Bridging Configuration** window. To one of the following to open the **System Bridging Configuration** window:

- In the **Site Map Navigation** window, click **System Bridging Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Bridge/Route**, **System Bridging Configuration**.




## Modifying System Bridging Parameters

In the **System Bridging Configuration** window:

1 Use the **WAN Broadcast** box to **Enable** or **Disable** the broadcasting of unknown WAN frames to all WAN logical interfaces.

2 Use the **Bridging** box to **Enable** or **Disable** bridging for the system.

3 In the **Aging Time Interval** box, type the interval, in seconds, after which Bridging Table entries are deleted if they are not relearned. The valid rate is 10 - 1000000. The default is 300 seconds.

4 Use the **Spanning Tree Protocol** box to **Enable** or **Disable** STP for the system.

5 Do one of the following:

- To activate the settings and close the **System Bridging Configuration** window, click **Set**.
- To cancel the settings and close the **System Bridging Configuration** window, click **Close**.

## Modifying System STP Parameters

In the **System Bridging Configuration** window:

1. In the **Priority** box, type the priority of the system (the entire chassis) within the network. The valid range is 0 to 65535. The value 0 indicates the highest priority. The default value is 32768.
2. In the **Max Age** box, type the number of seconds after which entries in the Bridging Table will be deleted if they are not re-learned. The valid range is 6 to 40. The default value is 20.
3. In the **Hello Time** box, type the interval, in seconds, at which you want the system to send Spanning Tree Protocol packets. The valid range is 1 to 10. The default value is 2.
4. In the **Forward Delay** box, type the number of seconds you want the system to wait before changing the state of a particular interface (e.g., to blocked). The valid range is 4 to 30. The default value is 15.

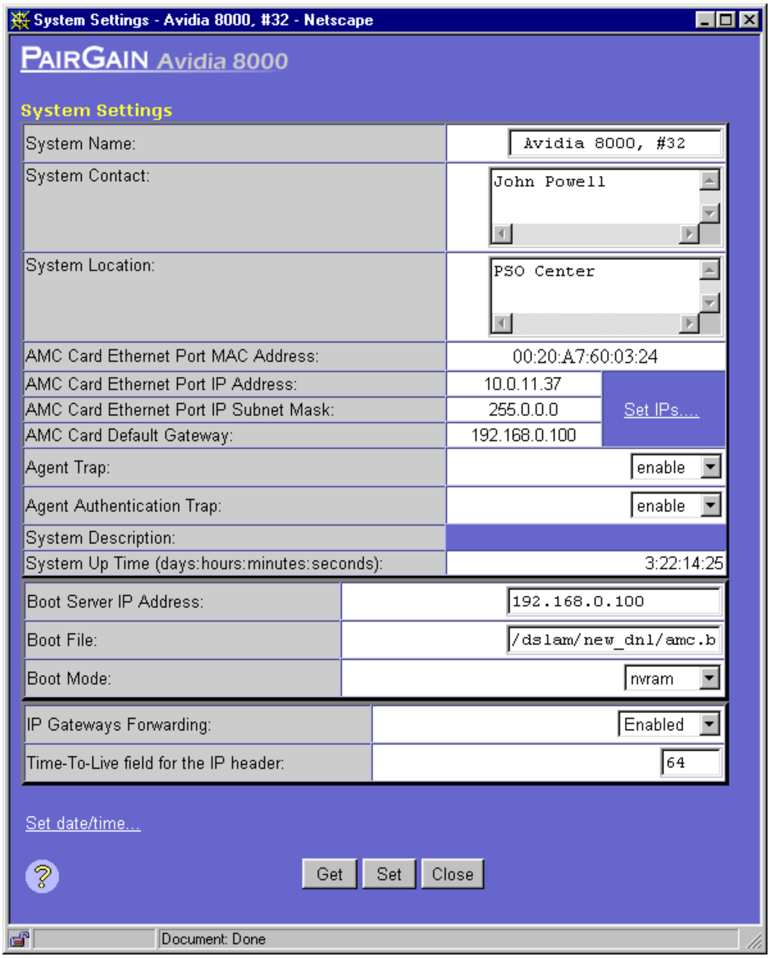
   This delay prevents the interface states from changing so rapidly that the STP cannot keep up with the current topology of the network and cannot therefore manage bridging efficiently.
5. Do one of the following:
   - To activate the settings and close the **System Bridging Configuration** window, click **Set**.
   - To cancel the settings and close the **System Bridging Configuration** window, click **Close**.

# CONFIGURING GLOBAL IP ROUTING SETTINGS

You configure global settings to enable IP routing and specify the time-to-live value for IP datagrams.

You configure global IP routing settings from the **System Settings** window. Do one of the following to open the **System Settings** window.

- In the **Site Map Navigation** window, click **System Settings**.
- In the **Tree Navigation** window, click **Configuration Management**, **System Setup**, **System Settings**.




1 In the **IP Gateways Forwarding** box, select **Enabled** or **Disabled** to enable or disable global IP forwarding.

In the **Time-To-Live field for the IP header** box, type the time-to-live value for internally-generated IP datagrams that do not contain a time-to-live value.

The time-to-live value is the number of hops a packet is allowed to cross before it reaches it's destination. The default is 64.

2 Do one of the following:

- Click **Get** to cancel the new settings. You can only click **Get** if you have not clicked **Set**.
- Click **Set** to save the new settings.

# Monitoring Subscriber Connections 25

This chapter describes how to monitor Avidia subscriber connections, including ADSL, SDSL frame, SDSL cell and IDSL lines, from the Web Interface.

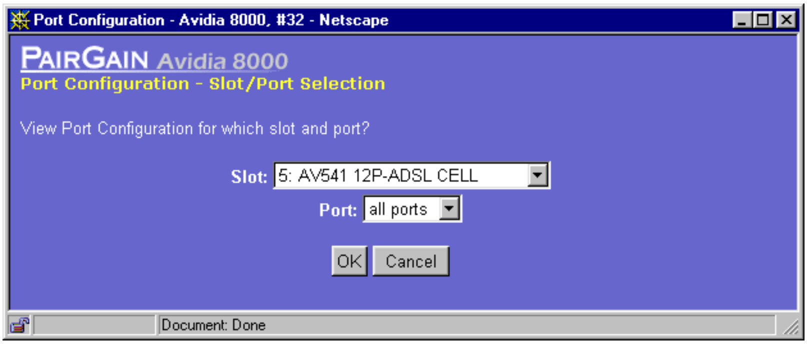
# MONITORING ADSL STATUS

The **ADSL Loop Status** window displays current loop status for a specified ADSL line.

**1** Do one of the following:

- In the **Site Map Navigation** window, click **ADSL Loop Status**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **Current Status**, **ADSL Loop Status**.

The **ADSL Loop Status - Slot/Port Selection** window displays.

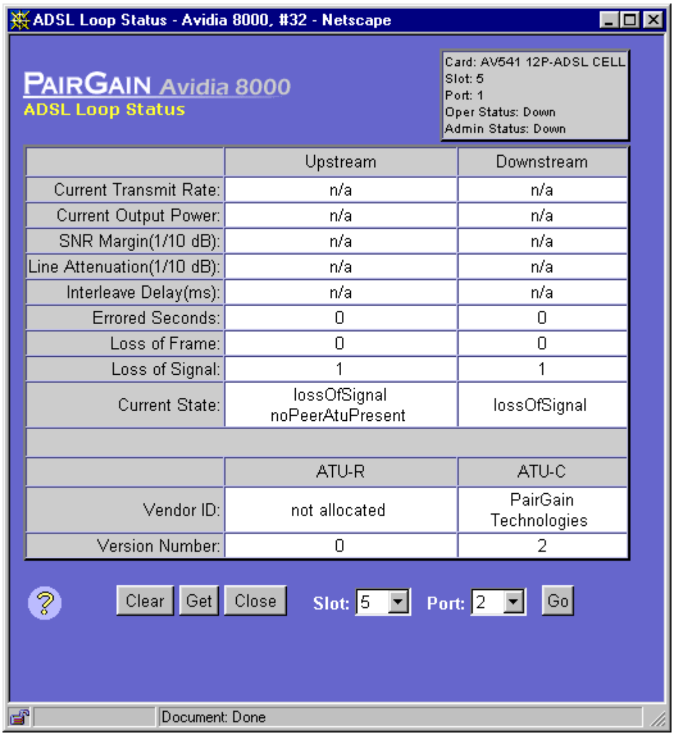



**2** Select the slot and port you want to monitor.

**3** To continue to the **ADSL Loop Status** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

**4** In the **ADSL Loop Status** window, you can do any of the following:

- Click **Get** to refresh the window with current data.
- In the **Port** box, select another port to monitor, then click **Go**.
- In the **Slot** box, select another slot to monitor, then click **Go**.


ADSL Loop Status - Avidia 8000, #32 - Netscape
PAIRGAIN Avidia 8000
ADSL Loop Status
Card: AV541 12P-ADSL CELL
Slot: 5
Port: 1
Oper Status: Down
Admin Status: Down
Upstream
Downstream
Current Transmit Rate: n/a n/a
Current Output Power: n/a n/a
SNR Margin(1/10 dB): n/a n/a
Line Attenuation(1/10 dB): n/a n/a
Interleave Delay(ms): n/a n/a
Errored Seconds: 0 0
Loss of Frame: 0 0
Loss of Signal: 1 1
Current State: lossOfSignal noPeerAtuPresent lossOfSignal
ATU-R
ATU-C
Vendor ID: not allocated PairGain Technologies
Version Number: 0 2
Clear
Get
Close
Slot: 5
Port: 2
Go
Document: Done

The **ADSL Loop Status** window provides the following information:

| Status Box | Description |
|---|---|
| Card<br>Slot<br>Port | The description, slot number and port number of the ADSL card for which the statistics are displayed. |
| Oper Status | The current operational state of the interface. Options:<br>• **Up**—The interface is operational and ready to receive packets.<br>• **Down**—The interface is not operational. |
| Admin Status | The configured state of the interface. Options:<br>• **Up**—The interface is activated.<br>• **Down**—The interface is deactivated. |
| Current Transmit Rate (Upstream/Downstream) | The rate at which data is currently transmitting. |
| Current Output Power (Upstream/Downstream) | The actual transmit output power in dBm. |
| SNR Margin (1/10 dB) (Upstream/Downstream) | The signal-to-noise ratio of the signal received by the ATU in 1/10 dB. |
| Line Attenuation (1/10 dB) (Upstream/Downstream) | The measured difference between the total power transmitted by the sending ATU and the total power received by the receiving ATU in 1/10 dB. |
| Interleave Delay (ms) (Upstream/Downstream) | The number of milliseconds delay that is occurring between interleaved data bits. |
| Errored Seconds (Upstream/Downstream) | The number of seconds since the counter was last cleared during which errors occur that prevent the payload from being corrected. |
| Loss of Frame (Upstream/Downstream) | The number of seconds since the counter was last cleared during which the frames on the ADSL interface lose sync. |
| Loss of Signal (Upstream/Downstream) | The number of intervals since the counter was last cleared during which a loss of signal condition has occurred. |

| Status Box | Description |
|---|---|
| Current State (Upstream/Downstream) | The current status of the ADSL loop. Options:<br>• **noDefect**—There are no errors on the line.<br>• **lossOfLink**—The ATU-C was unable to link with the ATU-R.<br>• **lossOfFraming**—The line is not receiving valid frames.<br>• **lossOfSignal**—The line is not receiving valid signal.<br>• **lossOfPower**—The line is not receiving power.<br>• **lossOfSignalQuality**—The margin has fallen below the configured target margin or the BER exceeds $10^{-7}$.<br>• **dataInitFailure**—The ATU was unable to initialize.<br>• **configInitFailure**—The ATU was unable to initialize because the ATU at the other end does not support the requested configuration.<br>• **protocolInitFailure**—The ATU was unable to initialize because of an incompatible protocol used by the peer at the other end.<br>• **noPeerAtuPresent**—The ATU was unable to initialize because no activation sequence was detected from the ATU at the other end. |
| Vendor ID (ATU-R/ATU-C) | The vendor ID of the ATU-C and the ATU-R. **not allocated** means there is no ATU-R present in the circuit. |
| Version Number (ATU-R/ATU-C) | The version number of the ATU-C and the ATU-R. |

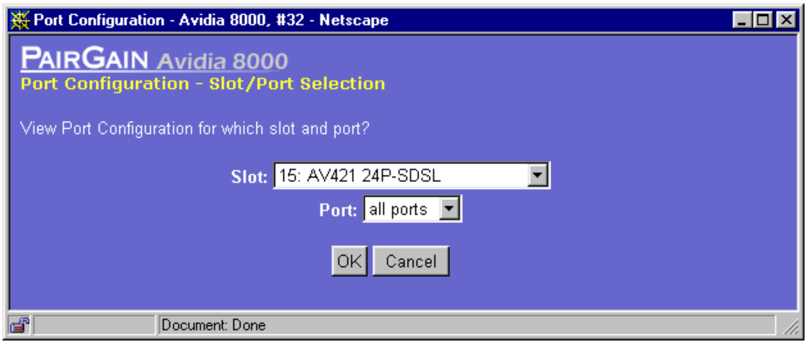
# MONITORING SDSL FRAME CURRENT STATISTICS

The **SDSL Loop Status** window displays current statistics for a specified SDSL line.

1 Do one of the following:

- In the **Site Map Navigation** window, click **SDSL Frame Loop Status**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Current Status**, **SDSL Frame Loop Status**.

The **SDSL Statistics - Slot/Port Selection** window displays.

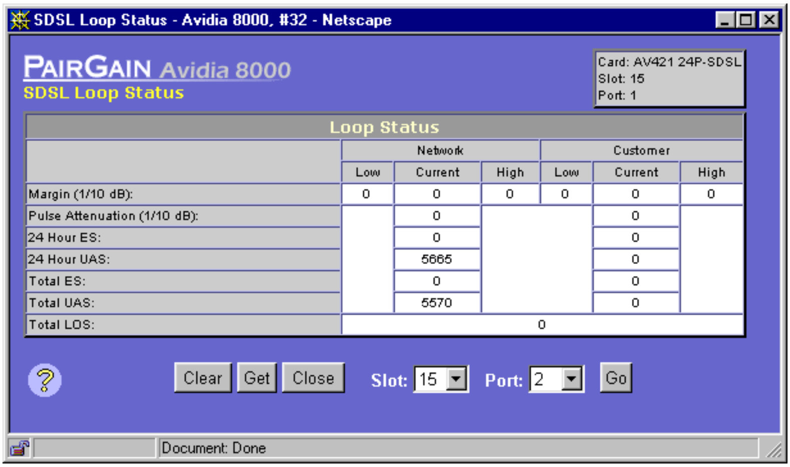



2 Select the slot and port you want to monitor.

3 To continue to the **SDSL Loop Status** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

4 In the **SDSL Statistics** window, you can do any of the following:

- Click **Get** to refresh the window with current data.
- In the **Port** box, select another port to monitor, then click **Go**.
- In the **Slot** box, select another slot to monitor, then click **Go**.




The **SDSL Loop Status** window provides the following information. **Network** indicates statistics for the upstream direction, toward the network. **Customer** indicates statistics for the downstream direction, toward the customer.

| Status Box | Description |
|---|---|
| Card<br>Slot<br>Port | The description, slot number and port number of the SDSL card for which the statistics are displayed. |
| Margin (1/10 dB) (Network/Customer) | The signal-to-noise ratio of the received signal in 1/10 dB.<br>• **Low** indicates the lowest margin that occurred since the SDSL loop synchronized.<br>• **Current** indicates the current margin.<br>• **High** indicates the highest margin that occurred since the SDSL loop synchronized. |
| Pulse Attenuation (1/10 dB) (Network/Customer) | The measured difference between the total signal power transmitted by the sending unit and the total signal power received by the receiving unit in 1/10 dB. |
| 24 Hour ES | The number of errored seconds that have occurred within the last 24 hours. |
| 24 Hour UAS | The number of unavailable seconds that have occurred within the last 24 hours. |
| Total LOS | The number of loss of signal conditions that have occurred within the last 24 hours. |

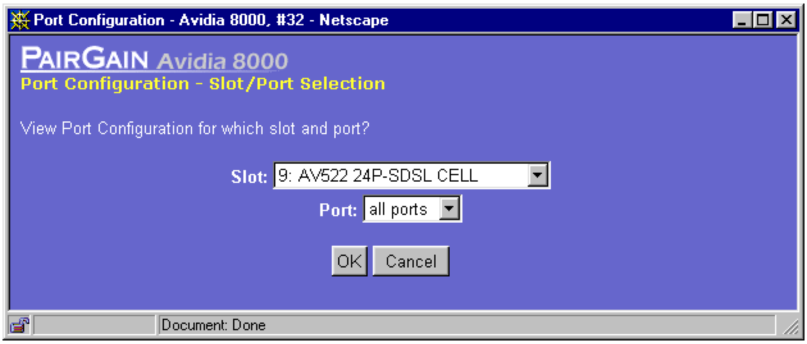
# MONITORING SDSL CELL PERFORMANCE

The **SDSL Cell Loop Status** window displays current loop status for a specified SDSL cell line.

**1** Do one of the following:

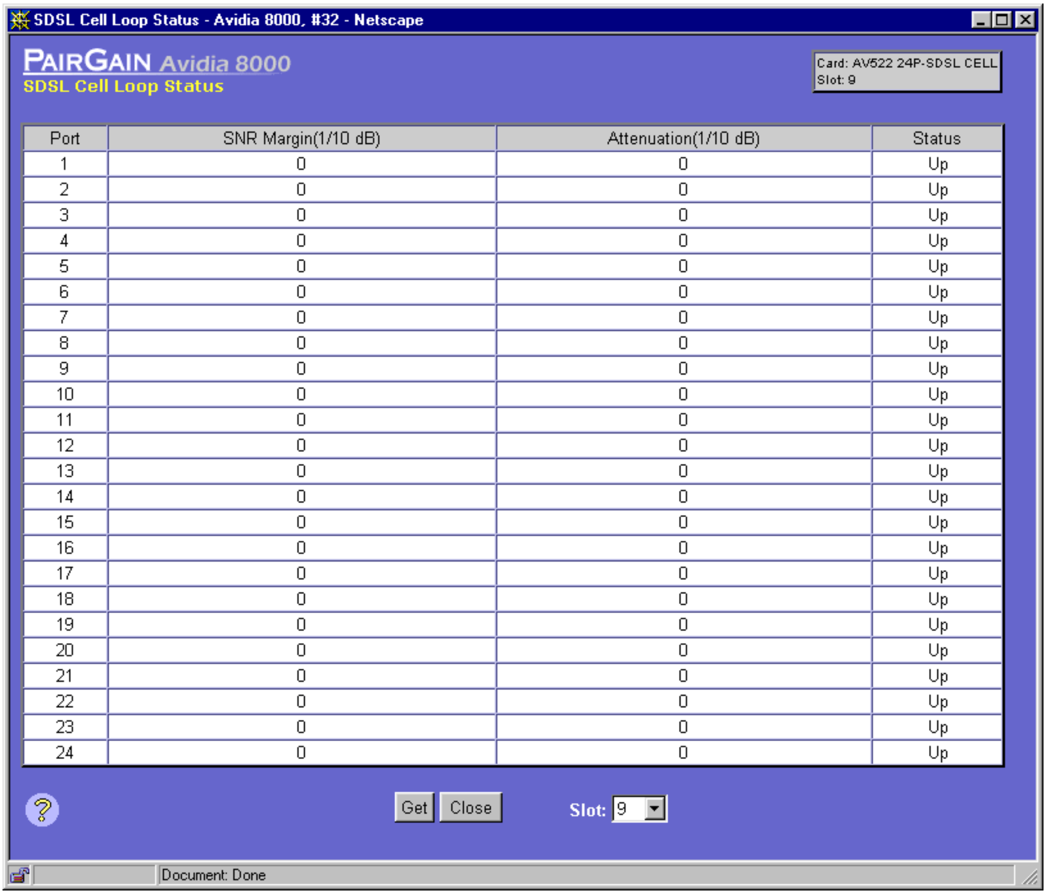
- In the **Site Map Navigation** window, click **SDSL Cell Loop Status**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Current Status**, **SDSL Cell Loop Statistics**.

The **SDSL Cell Loop Status - Slot/Port Selection** window displays.




**2** Select the slot and port you want to monitor.

**3** To continue to the **SDSL Cell Loop Status** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.




| Port | SNR Margin(1/10 dB) | Attenuation(1/10 dB) | Status |
|---|---|---|---|
| 1 | 0 | 0 | Up |
| 2 | 0 | 0 | Up |
| 3 | 0 | 0 | Up |
| 4 | 0 | 0 | Up |
| 5 | 0 | 0 | Up |
| 6 | 0 | 0 | Up |
| 7 | 0 | 0 | Up |
| 8 | 0 | 0 | Up |
| 9 | 0 | 0 | Up |
| 10 | 0 | 0 | Up |
| 11 | 0 | 0 | Up |
| 12 | 0 | 0 | Up |
| 13 | 0 | 0 | Up |
| 14 | 0 | 0 | Up |
| 15 | 0 | 0 | Up |
| 16 | 0 | 0 | Up |
| 17 | 0 | 0 | Up |
| 18 | 0 | 0 | Up |
| 19 | 0 | 0 | Up |
| 20 | 0 | 0 | Up |
| 21 | 0 | 0 | Up |
| 22 | 0 | 0 | Up |
| 23 | 0 | 0 | Up |
| 24 | 0 | 0 | Up |

The **SDSL Cell Loop Status** window provides the following information:

| Status Box | Description |
|---|---|
| Card Description<br>Slot | The slot number and description of the card for which the SDSL cell loop status is displayed. |
| Ports | The port number on the card for which the SDSL cell loop status is displayed. |
| SNR Margin (1/10 dB) | SNR margin is a measure of signal quality indicating how much margin can be dropped before the number of bit errors exceeds the ratio of 1x10-7 errored bits per bits transmitted. |
| Attenuation (1/10 dB) | The measured difference between the total power transmitted by the sending ATU and the total power received by the receiving ATU in 1/10 dB. |
| Status | The current status of the SDSL cell loop. Options:<br>• **Up**—The line is up.<br>• **Down**—The line is down.<br>• **Hand**—The line is trying to connect.<br>• **Test**—The line is in test mode.<br>• **Fail**—The line has failed. |

Click **Get** to refresh the window with current data.

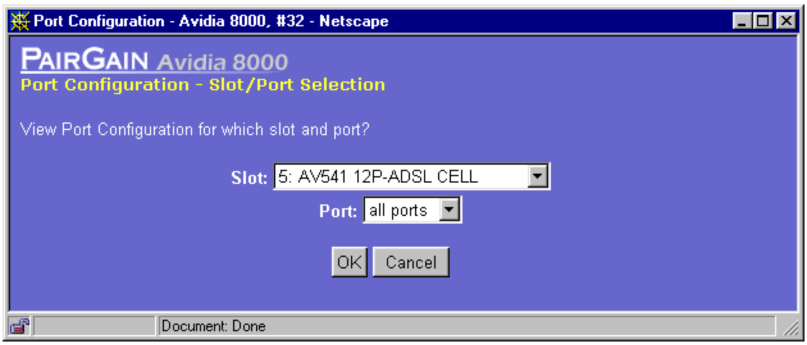
# MONITORING IDSL PERFORMANCE

The **IDSL Current Performance** window displays current loop status for a specified IDSL line.

**1** Do one of the following:

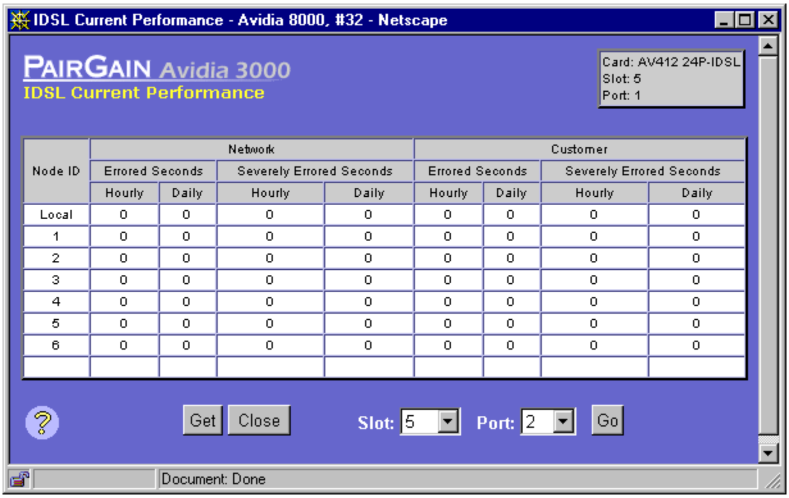
- In the **Site Map Navigation** window, click **IDSL Current Performance**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **IDSL Current Performance**.

The **IDSL Current Performance- Slot/Port Selection** window displays.




**2** Select the slot and port you want to monitor.

**3** To continue to the **IDSL Current Performance** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.




**4** In the **IDSL Current Performance** window, you can do any of the following:

- Click **Get** to refresh the window with current data.
- In the **Port** box, select another port to monitor, then click **Go**.
- In the **Slot** box, select another slot to monitor, then click **Go**.

The **IDSL Current Performance** window provides the following information. **Network** indicates statistics for the upstream direction, toward the network. **Customer** indicates statistics for the downstream direction, toward the customer.

| Status Box | Description |
|---|---|
| Card<br>Slot<br>Port | The description, slot number and port number of the SDSL card for which the statistics are displayed. |
| Node ID | The node for which current performance is displayed. |
| Hourly Errored Seconds (Network/Customer) | The number of errored seconds since this hour began. |
| Daily Errored Seconds (Network/Customer) | The number of errored seconds since this day began. |
| Hourly Severely Errored Seconds (Network/Customer) | The number of severely errored seconds since this hour began. |
| Daily Severely Errored Seconds (Network/Customer) | The number of severely errored seconds since this day began. |

# MONITORING NETWORK CONNECTIONS 26

This chapter describes how to monitor Avidia network connections, including loop status, performance history, and remote status for SONET, DS1, E1, and DS3 lines from the Web interface. It also describes how to monitor ATM statistics.

# MONITORING SONET PERFORMANCE

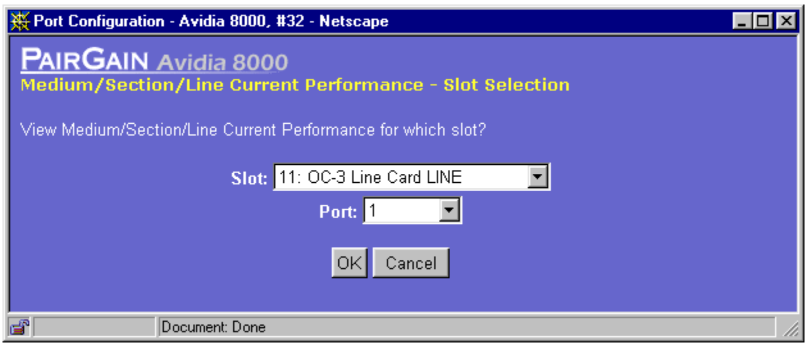
You can monitor SONET current performance by Medium, Section, Line and Path layer.

## Medium/Section/Line Current Performance

**1** Do one of the following:

- In the **Site Map Navigation** window, click **Sonet Medium/Section/Line.**
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **SONET Medium/Section/Line Current Performance**.

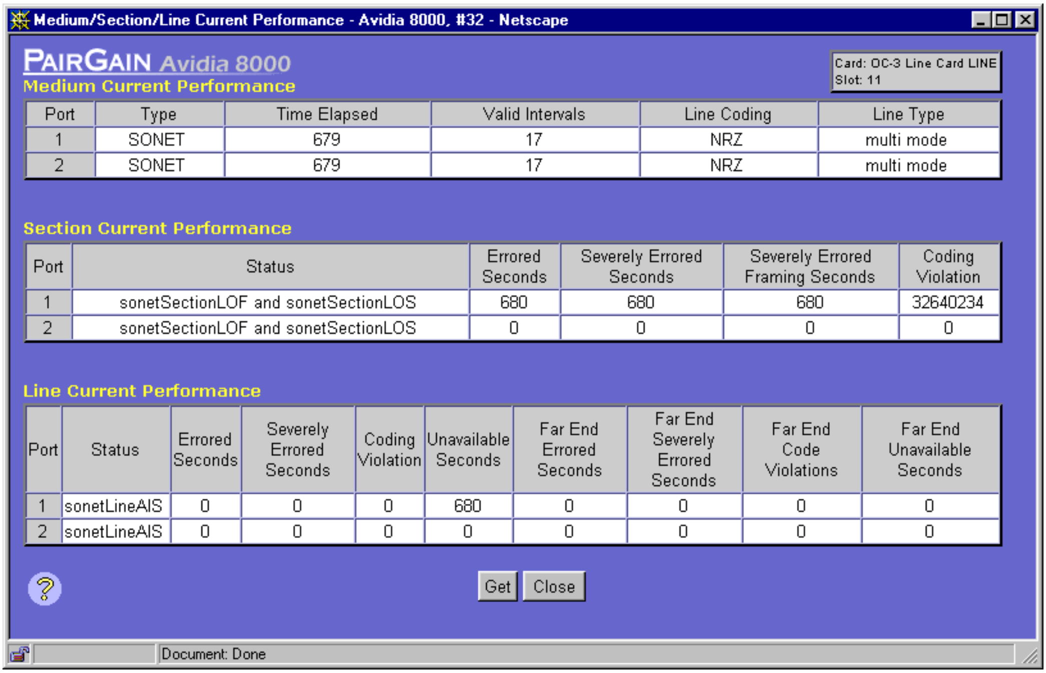
The **Medium/Section/Line Current Performance - Slot Selection** window displays.




**2** Select the slot you want to monitor.

**3** To continue to the **Medium/Section/Line Current Performance** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

**4** If desired, click **Get** to refresh the **Medium/Section/Line Current Performance** window with current data.




The **Medium/Section/Line Current Performance** window provides the following information for the current 15-minute data collection period.

| Information | Description |
|---|---|
| Slot<br>Card Description | The slot number and description of the line card for which the current performance is displayed. |
| **Medium Current Performance** | |
| Port | The port number for which the Medium current performance is displayed (each line card has two ports). |
| Type | The interface type (**SONET** or **SDH**). |
| Time Elapsed | The number of seconds that have elapsed since the beginning of the current 15-minute data collection period. |
| Valid Intervals | The number of 15-minute performance data collection intervals supported by the system. The Avidia system has 96 intervals (equating to 24 hours). |
| Line Coding | The type of coding on the SONET interface. The Avidia system has NRZ (Non Return to Zero) SONET line coding. Therefore, the value for this parameter always displays **NRZ**. |

| Information | Description |
|---|---|
| Line Type | The type of SONET line. The Avidia system currently supports **short-reach single-mode**, **multi-mode**, and **other** SONET lines. |
| **Section Current Performance** | |
| Port | The port number for which the Section current performance is displayed (each line card has two ports). |
| Status | Options:<br>• **sonetSectionNoDefect**—There are no errors on the SONET Section layer.<br>• **sonetSectionLOS**—There is a Loss Of Signal on the SONET Section layer.<br>• **sonetSectionLOF**—There is a Loss Of Frame on the SONET Section layer. |
| Errored Seconds | The number of seconds during which at least one Section layer bipolar error was detected or a severely errored frame or loss of signal error was present. |
| Severely Errored Seconds | The number of seconds during which 2,500 or more Section layer bipolar errors were detected or a severely errored frame or loss of signal error was present. |
| Severely Errored Framing Seconds | The number of seconds during which a severely errored frame error was present. A severely errored frame is detected when the incoming signal has a minimum of four consecutive errored framing patterns. |
| Coding Violation | A count of bipolar errors detected at the Section layer. |

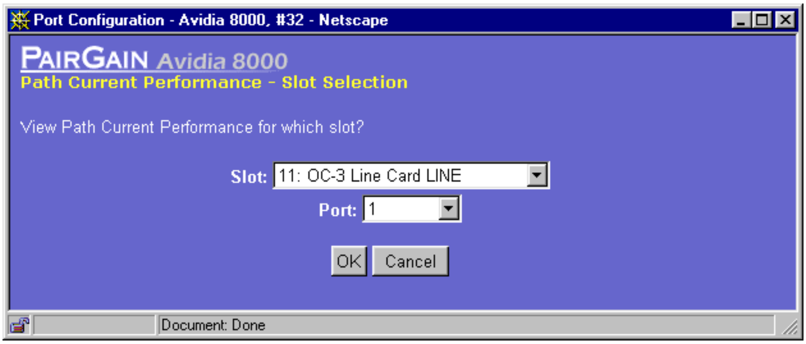
| Information | Description |
|---|---|
| **Line Current Performance** | |
| Port | The port number for which the Line current performance is displayed (each line card has two ports). |
| Status | Options:<br>• **sonetLineNoDefect**—There are no errors on the SONET line.<br>• **sonetLineAIS** (Alarm Indication Signal)—There is an alarm at the local end of the SONET line.<br>• **SonetLineRDI** (Remote Defect Indication)—There is an alarm at the remote end of the SONET line. |
| Errored Seconds | The number of seconds in the current 15 minute performance monitoring interval during which at least one Line layer bipolar error was detected or an Alarm Indication Signal - Line (AIS-L) error was present. |
| Severely Errored Seconds | The number of seconds in the current 15 minute performance monitoring interval during which 2,500 or more Line layer bipolar errors were detected or an AIS-L error was present. |
| Coding Violation | The number of bipolar errors detected at the Line layer. |
| Unavailable Seconds | The number of seconds during which the line was unavailable. A line becomes unavailable at ten consecutive severely errored seconds. |
| Far End Errored Seconds | The number of seconds during which at least one Line layer bipolar error was reported by the far-end or a Remote Defect Indicator - Line (RDI-L) error was present. |
| Far End Severely Errored Seconds | The number of seconds during which 2,500 or more Line layer bipolar errors were reported by the far end or an RDI-L error was present. |
| Far End Code Violations | The number of bipolar errors detected by the far end and reported back to the near end. |
| Far End Unavailable Seconds | The number of seconds during which the line is unavailable at the far end. |

## Path Current Performance

**1** Do one of the following:

- In the **Site Map Navigation** window, click **Statistics**, **SONET Path**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **SONET Path Current Performance**.

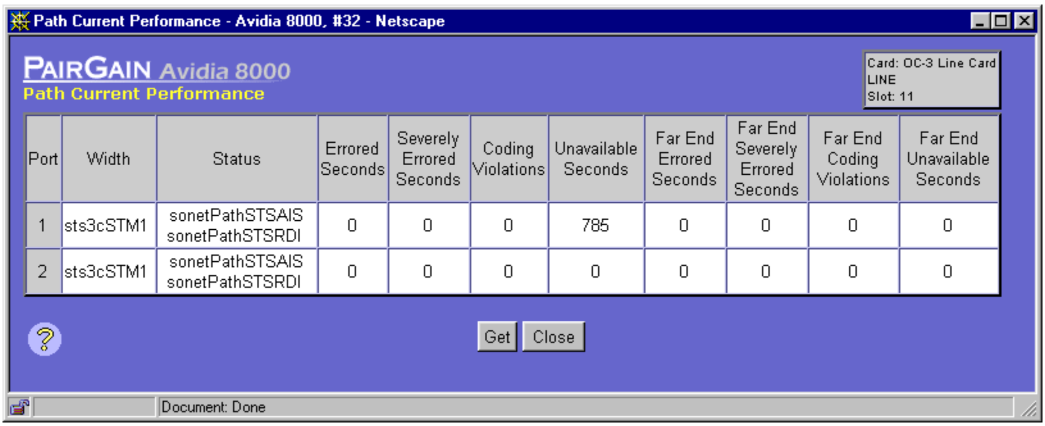
The **Path Current Performance - Slot Selection** window displays.




**2** Select the slot containing the port you want to monitor.

**3** To continue to the **Path Current Performance** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

**4** If desired, click **Get** to refresh the **Path Current Performance** window with current data.




| Port | Width | Status | Errored Seconds | Severely Errored Seconds | Coding Violations | Unavailable Seconds | Far End Errored Seconds | Far End Severely Errored Seconds | Far End Coding Violations | Far End Unavailable Seconds |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | sts3cSTM1 | sonetPathSTSAIS sonetPathSTSRDI | 0 | 0 | 0 | 785 | 0 | 0 | 0 | 0 |
| 2 | sts3cSTM1 | sonetPathSTSAIS sonetPathSTSRDI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The **Path Current Performance** window provides the following information:

| Information | Description |
|---|---|
| Slot<br>Card Description | The slot number and description of the line card for which the Path current performance is displayed. |
| Port | The port number for which the Path current performance is displayed. |
| Width | The designated optical bandwidth. |
| Status | The status of the interface. Options:<br>• **sonetPathNoDefect**—There are no errors on the Path layer.<br>• **sonetPathSTSLOP**—There is a Loss of Pointer error on the interface.<br>• **sonetPathSTSAIS** (Alarm Indication Signal)—There is an alarm at the local end of the SONET line.<br>• **sonetPathSTSRDI** (Remote Defect Indication)—There is an alarm at the remote end of the SONET line.<br>• **sonetPathUnequipped**—The Path layer is not configured properly at the remote end.<br>• **sonetPathSignalLabelMismatch**—The Path layer is not properly provisioned. |
| Errored Seconds | The number of seconds during which at least one Path layer bipolar error was detected or an Alarm Indication Signal - Path (AIS-P) error was present. |
| Severely Errored Seconds | The number of seconds during which 2,500 or more Path layer bipolar errors were detected or an AIS-P or Loss of Pointer - Path (LOP-P) error was present. |
| Coding Violations | The number of bipolar errors detected at the Path layer. |
| Unavailable Seconds | The number of seconds during which the Path was unavailable. A Path becomes unavailable after ten consecutive severely errored seconds. |
| Far End Errored Seconds | The count of seconds during which at least one Path layer bipolar error was reported by the far-end or a one-bit RDI-P (Remote Defect Indicator - Path) error was present. |
| Far End Severely Errored Seconds | The number of seconds during which 2,500 or more Path bipolar errors were reported by the far-end or a one-bit RDI-P error was present. |
| Far End Coding Violations | The number of bipolar errors reported by the far-end and reported back to the near-end using the RDI-P indication. |
| Far End Unavailable Seconds | The number of seconds during which the Path was unavailable at the far end. |

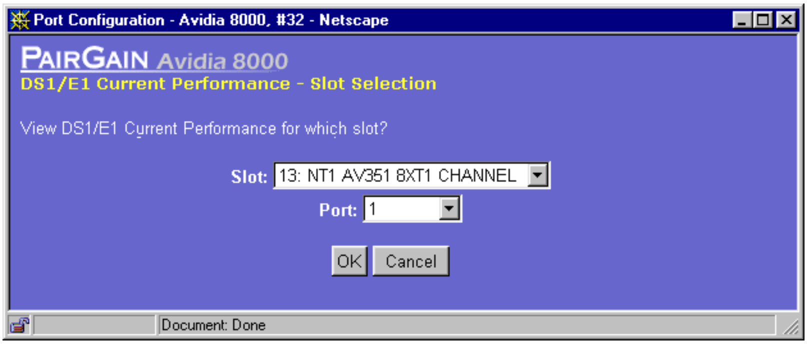
# MONITORING DS1 PERFORMANCE

The **DS1 Current Performance** window displays current statistics for a specified DS1 line.

1 Do one of the following:

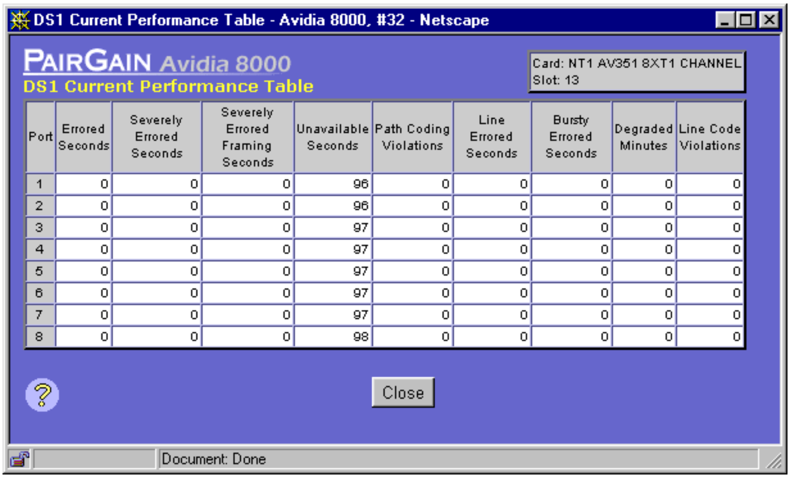
- In the **Site Map Navigation** window, click **DS1 Current Performance**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **DS1 Current Performance**.

The **DS1/E1 Current Performance - Slot Selection** window displays.



2 Select the slot that contains the port you want to monitor, then click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

The **DS1 Current Performance Table** window displays.




| Port | Errored Seconds | Severely Errored Seconds | Severely Errored Framing Seconds | Unavailable Seconds | Path Coding Violations | Line Errored Seconds | Bursty Errored Seconds | Degraded Minutes | Line Code Violations |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0 |

The **DS1 Current Performance Table** window displays the following information.

| Information | Description |
|---|---|
| Card<br>Slot<br>Port | The description, slot number and port of the card. |
| Errored Seconds | Errored seconds are seconds during which any of the following occur:<br>• one or more AIS defects<br>• one or more controlled slips<br>• one or more Path code violations<br>• one or more out-of-frame defects<br>• one or more bipolar errors (D4 mode only) |
| Severely Errored Seconds | For ESF mode, severely errored seconds are seconds in which 320 or more Path code violation errors, one or more out-of-frame defects or an AIS defect occur.<br>For D4 mode, severely errored seconds are seconds in which framing errors, out of frame defects, or 1,544 or more line coding violations occur. |
| Severely Errored Framing Seconds | Severely errored framing seconds are seconds during which one or more out-of-frame defects or an AIS defect occurs. |
| Unavailable Seconds | The number of seconds during which the interface was unavailable. A line becomes unavailable at ten consecutive severely errored seconds. |
| Path Coding Violations | Frame synchronization bit errors. |
| Line Errored Seconds | The number of seconds during which one or more line code violations occur. |
| Bursty Errored Seconds | The number of seconds during which between one and 320 Path coding violations occurred and no severely errored frame defects or AIS defects occurred. This applies to ESF mode only. |
| Degraded Minutes | This parameter is not currently supported, therefore **0** displays. |
| Line Code Violations | Bipolar violations or excessive zeroes. |

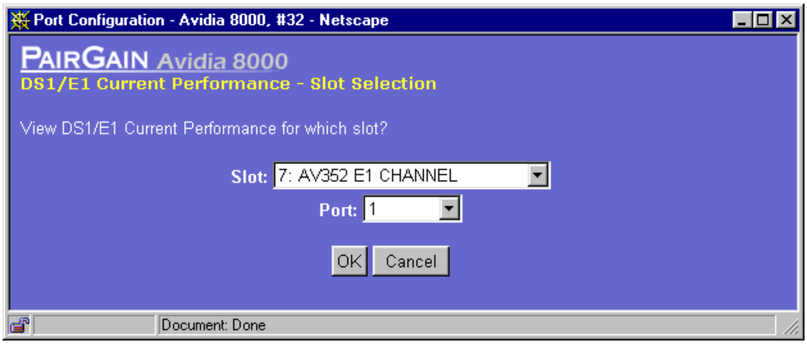
# MONITORING E1 PERFORMANCE

The **E1 Current Performance** window displays current statistics for a specified E1 line.

**1** Do one of the following:

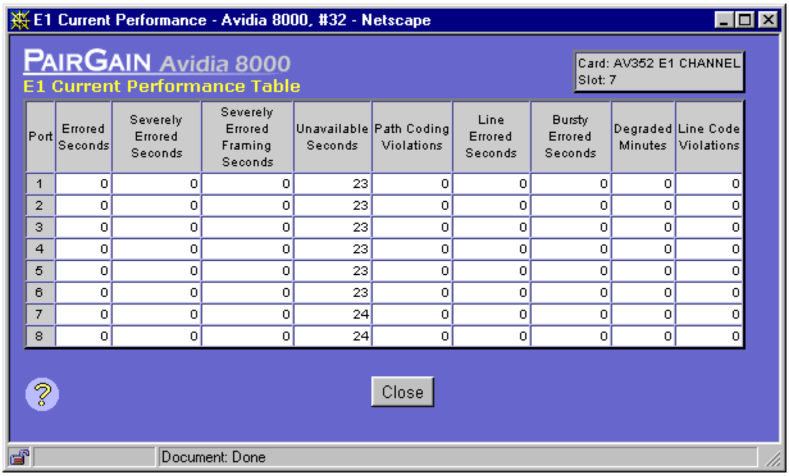
- In the **Site Map Navigation** window, click **E1 Current Performance**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **E1 Current Performance**.

The **DS1/E1 Current Performance - Slot Selection** window displays.



**2** Select the slot that contains the port you want to monitor, then click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

The **E1 Current Performance Table** window displays.




| Port | Errored Seconds | Severely Errored Seconds | Severely Errored Framing Seconds | Unavailable Seconds | Path Coding Violations | Line Errored Seconds | Bursty Errored Seconds | Degraded Minutes | Line Code Violations |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 |

The **E1 Current Performance Table** window displays the following information.

| Information | Description |
|---|---|
| Card<br>Slot<br>Port | The description, slot number and port of the card. |
| Errored Seconds | Errored seconds are seconds during which any of the following occur:<br>• one or more AIS defects<br>• one or more controlled slips<br>• one or more Path code violations<br>• one or more out-of-frame defects<br>• one or more bipolar errors |
| Severely Errored Seconds | For ESF mode, severely errored seconds are seconds in which 320 or more Path code violation errors, one or more out-of-frame defects or an AIS defect occur.<br>For D4 mode, severely errored seconds are seconds in which framing errors, out of frame defects, or 1,544 or more line coding violations occur. |
| Severely Errored Framing Seconds | Severely errored framing seconds are seconds during which one or more out-of-frame defects or an AIS defect occurs. |
| Unavailable Seconds | The number of seconds during which the interface was unavailable. A line becomes unavailable at ten consecutive severely errored seconds. |
| Path Coding Violations | Frame synchronization bit errors. |
| Line Errored Seconds | The number of seconds during which one or more line code violations occur. |
| Bursty Errored Seconds | The number of seconds during which between one and 320 Path coding violations occurred and no severely errored frame defects or AIS defects occurred. This applies to ESF mode only. |
| Degraded Minutes | This parameter is not currently supported, therefore **0** displays. |
| Line Code Violations | Bipolar violations or excessive zeroes. |

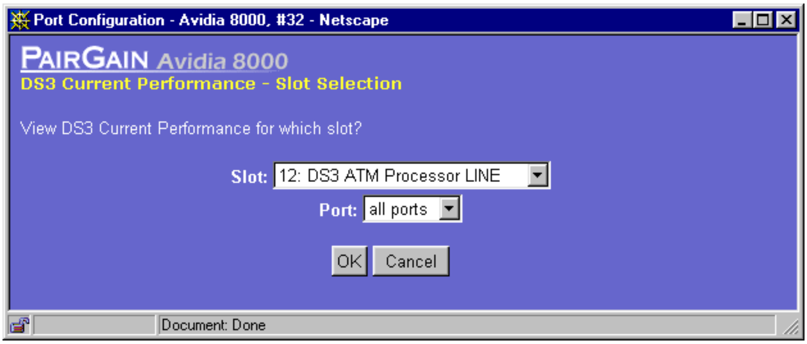
# MONITORING DS3 PERFORMANCE

The **DS3 Current Performance** window displays current statistics for a specified DS3 line.

**1** Do one of the following:

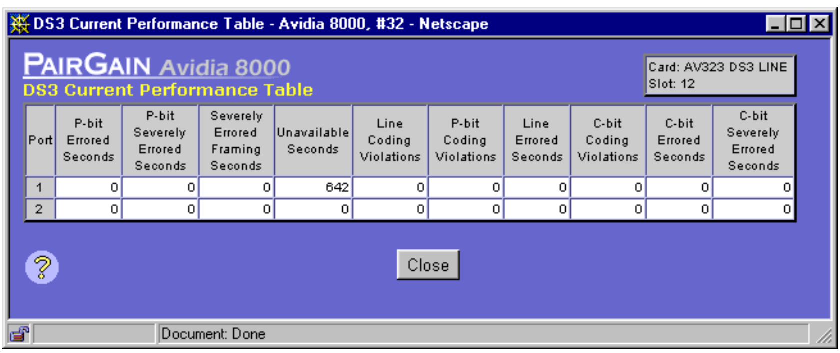
- In the **Site Map Navigation** window, click **DS3 Current Performance**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **DS3 Current Performance**.

The **DS3 Current Performance - Slot Selection** window displays.




**2** Select the slot that contains the port you want to monitor, then click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

The **DS3 Current Performance Table** window displays.



The **DS3 Current Performance Table** window displays the following information.

| Information | Description |
|---|---|
| Card<br>Slot<br>Port | The description, slot number and port of the card. |
| P-bit Errored Seconds | P-bit errored seconds are seconds during which any of the following occur:<br>• an incoming AIS is detected<br>• one or more Path code violations<br>• one or more out-of-frame defects |
| P-bit Severely Errored Seconds | P-bit severely errored seconds are seconds during which any of the following occur:<br>• an incoming AIS is detected<br>• 44 or more Path code violations<br>• one or more out-of-frame defects |
| Severely Errored Framing Seconds | Severely errored framing seconds are seconds during which one or more out-of-frame errors or an incoming AIS is detected. |
| Unavailable Seconds | Unavailable seconds are seconds during which the interface was unavailable. A line becomes unavailable at ten consecutive P-bit severely errored seconds. |
| Line Code Violations | Line coding violations are a count of bipolar violations and excessive zeroes. |
| P-bit Coding Violations | P-bit coding violations occur when a received P-bit code on the DS3 M-frame is not identical to the corresponding locally-calculated code. |
| Line Errored Seconds | Line errored seconds are seconds during which one or more line code violations occur. |
| C-bit Coding Violations | C-bit coding violations are C-bit parity errors. |
| C-bit Errored Seconds | C-bit errored seconds are seconds during which any of the following occur:<br>• one or more C-bit coding violations<br>• one or more out-of-frame defects<br>• an incoming AIS is detected |
| C-bit Severely Errored Seconds | C-bit severely errored seconds are seconds during which any of the following occur:<br>• 44 or more C-bit coding violations<br>• one or more out-of-frame defects<br>• an incoming AIS is detected |

# MONITORING APS STATUS

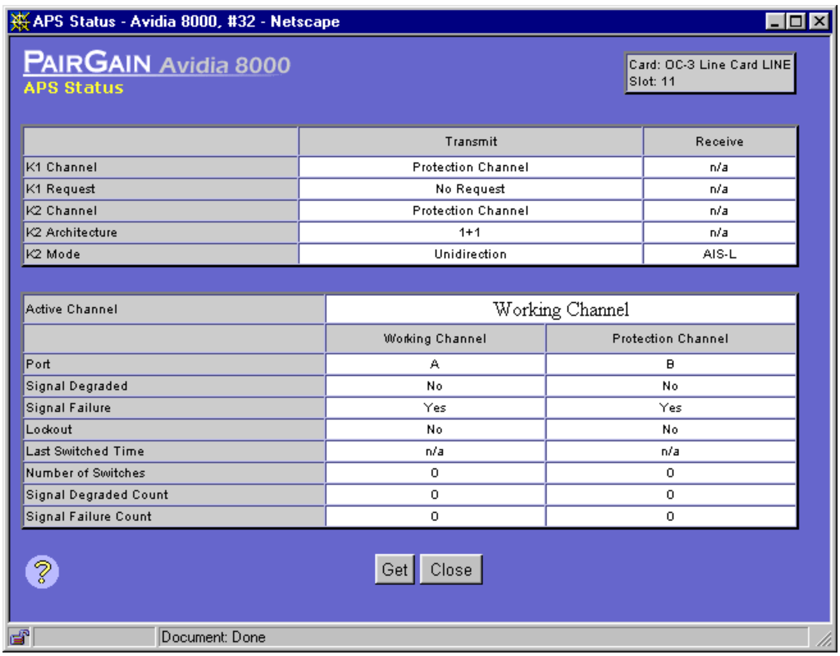
You can monitor APS information such as the date and time of APS events and the currently active channel.

You monitor APS status for both the local APS and the APS at the remote end of the connection from the **APS Status** window.

1 Do one of the following to open the **APS Status - Slot Selection** window:

- In the **Site Map Navigation** window, click **APS Status**.
- In the **Tree Navigation** window, click **Diagnostics Management**, **APS Status**.

2 Select the slot for which you want to display APS status, then click **OK** to display the **APS Status** window.



The **APS Status** window displays the following information.

| Information | Description |
|---|---|
| Card<br>Slot | The description and slot number of the card. |
| K1 Channel | Indicates whether the ATM traffic is being carried on the working channel or the protection channel. If this box is empty, there is no cable connected to the port. |
| K1 Request | Indicates what, if any, manual APS request has been issued. Options:<br>• **Lockout Of Protection**—APS is disabled.<br>• **Forced Switch**—traffic was manually switched to the current channel.<br>• **Signal Failure (SF)**—The channel is experiencing a Loss of Signal, Loss of Frame, or AIS-L error or a line BER of $10^{-3}$ or greater.<br>• **Signal Degrade (SD)**—The channel is experiencing signal degradation, meaning a line BER of $10^{-7}$ or greater.<br>• **Manual Switch**—traffic will switch to the working channel if there are no other conditions (such as the configured Wait Time To Revert) that prohibit switching to that channel.<br>• **Wait To Restore**—The APS is in revertive mode and a timer is preventing the traffic from switching back to the working channel.<br>• **Do Not Revert**—The local APS is in non-revertive mode and it has switched to the protection channel.<br>• **No Request**—No manual APS request has been issued. |
| K2 Channel | Indicates whether the ATM traffic is being carried on the working channel or the protection channel. If this box is empty, there is no cable connected to the port. |
| K2 Architecture | The type of APS architecture in use by the system. The Avidia system currently uses only 1:1 architecture, meaning that the ATM traffic carried on the working channel is mirrored on the protection channel. |
| K2 Mode | The APS Mode. The Avidia system is unidirectional, meaning that the switching is complete once traffic switches to the protection channel. |
| Active Channel | The channel that is currently carrying the ATM traffic, either **Working Channel** or **Protection Channel**. |
| Port | Indicates which port is the working channel and which port is the protection channel. |
| Signal Degraded | **Yes** indicates that the signal has degraded. **No** indicates that there is no signal degradation. |
| Signal Failure | **Yes** indicates that the signal has failed. **No** indicates that the signal is active. |
| Lockout | **Yes** indicates that APS has been disabled. **No** indicates that APS has not been disabled. |

| Information | Description |
|---|---|
| Last Switched Time | The date and time of the last APS switch. |
| Number of Switches | The number of switches that have occurred since the OC3 card was last reset. |
| Signal Degraded Count | The number of times the signal has degraded and the traffic has switched to the protection channel as a result. |
| Signal Failure Count | The number of times the signal has failed and the traffic has switched to the protection channel as a result. |

# MONITORING PHYSICAL INTERFACES 27

This chapter describes how to monitor physical interfaces and ATM cell switch status from the Web interface.

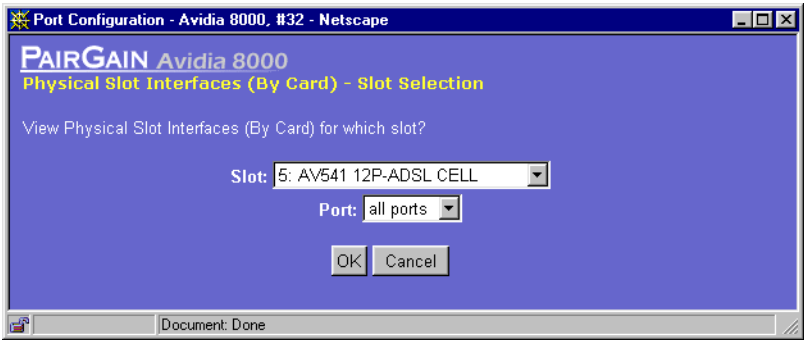
# OPENING THE INTERFACE WINDOW

You monitor all physical interfaces monitor the interfaces by slot.

**1** Do one of the following:

- In the **Site Map Navigation** window, click **Physical Slot Interfaces**.
- In the **Tree Navigation** window, click **Performance Monitoring**, **Statistics**, **Physical Slot Interfaces**.

The **Physical Slot Interfaces (By Card) - Slot Selection** window displays.



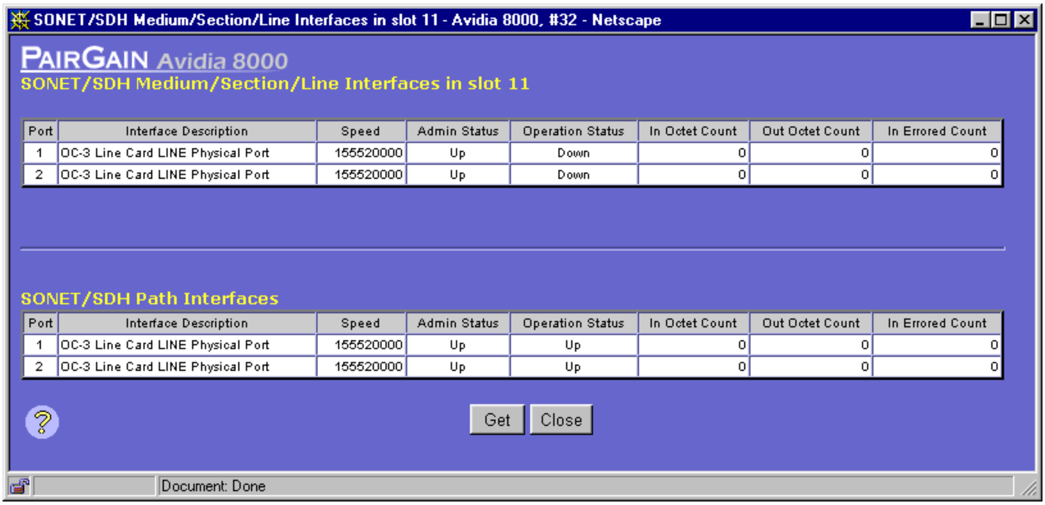

**2** Select the slot you want to monitor, then click **OK**. Click **Cancel** to discontinue this procedure.

A window displays the interface data for the selected slot. Each physical interface window displays some combination of the following information.

| Information | Description |
|---|---|
| Slot and Port Number | The slot and port number of the interface. |
| Interface Description | A text string describing the name of the interface manufacturer, product name and version. |
| Interface Type | The type of interface. For example: ADSL, SDSL, Ethernet. |
| MTU | The size of the largest datagram that can be sent or received on the interface, specified in octets. |
| Speed | An estimate of the interface current bandwidth in bits per second. |

| Information | Description |
|---|---|
| Admin Status | The configured state of the interface. Options:<br>• **Up**—The interface is activated.<br>• **Down**—The interface is deactivated. |
| Operation Status | The current operational state of the interface. Options:<br>• **Up**—The interface is operational and ready to receive packets.<br>• **Down**—The interface is not operational. |
| In Octet Count | The total number of octets received on the interface, including framing characters. |
| In Unicast Pkt Count | The number of subnetwork-unicast packets delivered to a higher-layer protocol. |
| In Discard Count | The number of inbound packets that were chosen to be discarded to prevent them from being delivered to a higher-layer protocol, even though no errors had been detected. |
| In Error Pkt Count | The number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. |
| In Unknown Pkt Count | The number of packets received via the interface that were discarded because of an unknown or unsupported protocol. |
| Out Octet Count | The number of octets transmitted out of the interface, including framing characters. |
| Out Unicast Pkt Count | The total number of packets that higher-level protocols requested be transmitted to a subnetwork-unicast address, including those that were discarded or not sent. |
| Out Discard Count | The number of outbound packets that were chosen to be discarded to prevent them from being transmitted to a higher-layer protocol, even though no errors had been detected. |
| Out Error Pkt Count | The number of outbound packets the could not be transmitted because of errors. |
| Link Up/Down | Indicates whether trap generation is **enabled** or **disabled**. |
| High Speed | The current speed, in Mbps. This value is rounded off to the nearest of the following values:<br>• 2<br>• 6<br>• 8 |
| Connect | Whether the physical connector is present or not. **True** indicates the connector is present. **False** indicates the connector is absent. |

# PHYSICAL SONET INTERFACES


SONET/SDH Medium/Section/Line Interfaces in slot 11 - Avidia 8000, #32 - Netscape

PAIRGAIN Avidia 8000

SONET/SDH Medium/Section/Line Interfaces in slot 11

| Port | Interface Description | Speed | Admin Status | Operation Status | In Octet Count | Out Octet Count | In Errored Count |
|---|---|---|---|---|---|---|---|
| 1 | OC-3 Line Card LINE Physical Port | 155520000 | Up | Down | 0 | 0 | 0 |
| 2 | OC-3 Line Card LINE Physical Port | 155520000 | Up | Down | 0 | 0 | 0 |

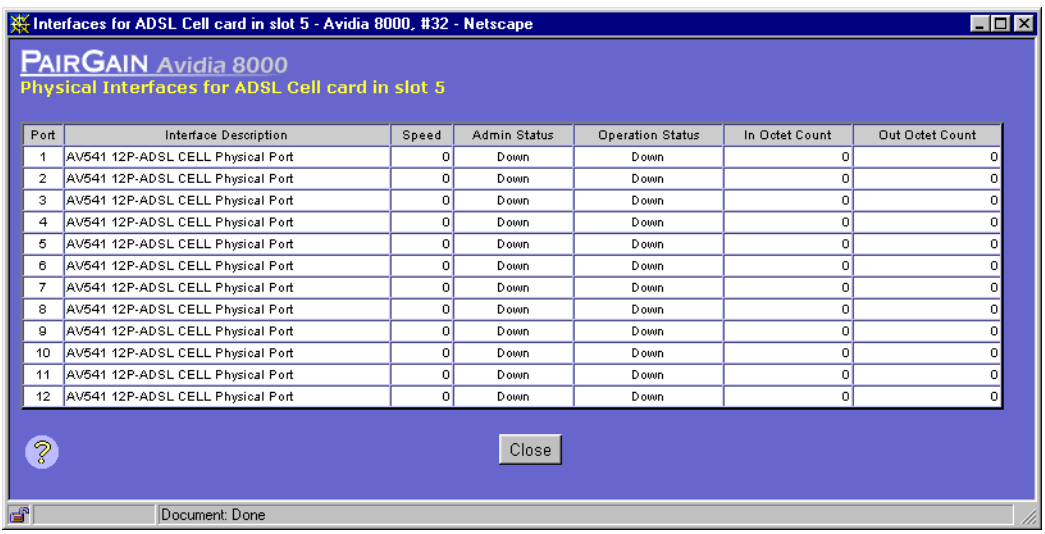
SONET/SDH Path Interfaces

| Port | Interface Description | Speed | Admin Status | Operation Status | In Octet Count | Out Octet Count | In Errored Count |
|---|---|---|---|---|---|---|---|
| 1 | OC-3 Line Card LINE Physical Port | 155520000 | Up | Up | 0 | 0 | 0 |
| 2 | OC-3 Line Card LINE Physical Port | 155520000 | Up | Up | 0 | 0 | 0 |

Get Close

Document: Done

# PHYSICAL ADSL INTERFACES


Interfaces for ADSL Cell card in slot 5 - Avidia 8000, #32 - Netscape

PAIRGAIN Avidia 8000

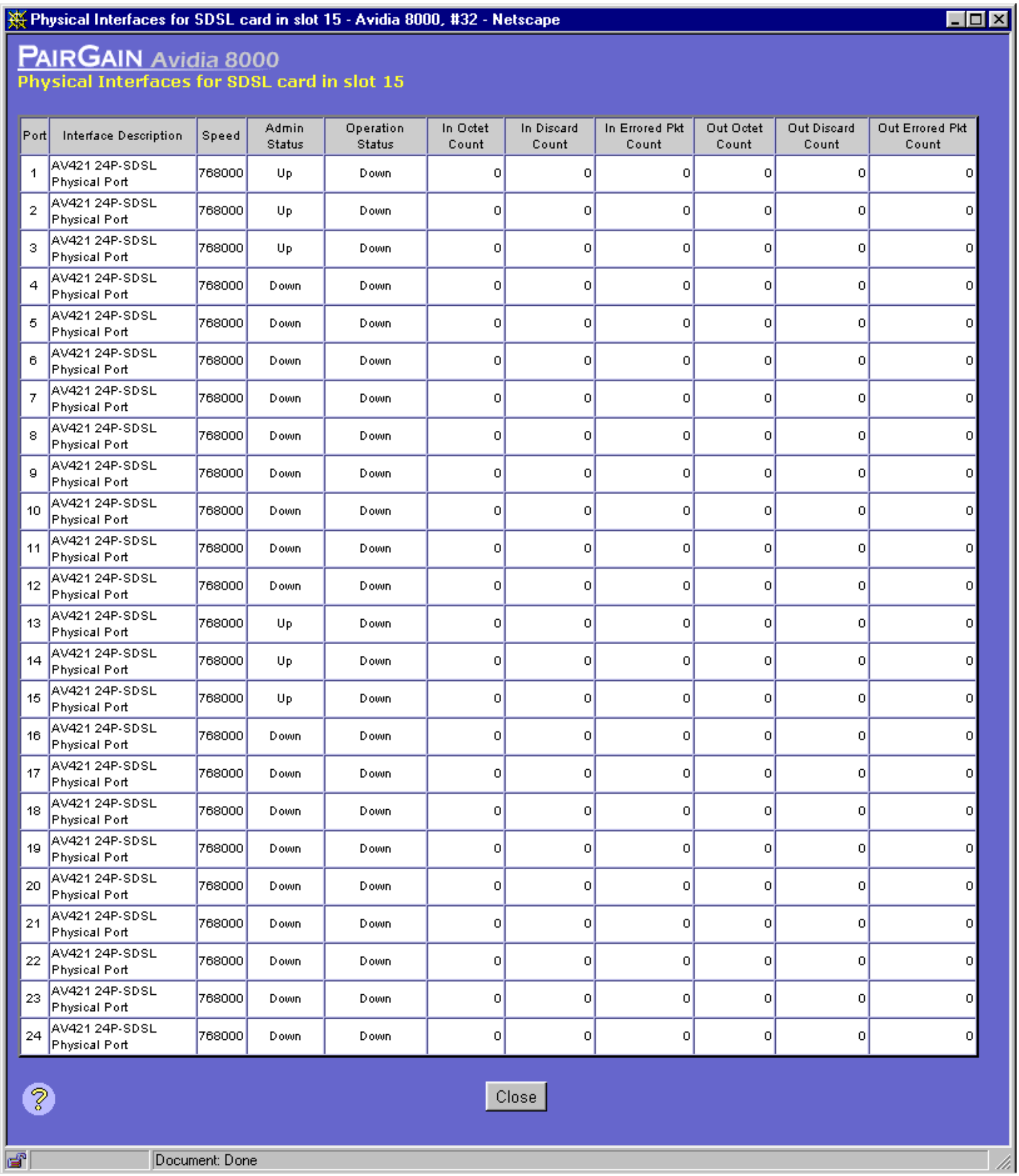
Physical Interfaces for ADSL Cell card in slot 5

| Port | Interface Description | Speed | Admin Status | Operation Status | In Octet Count | Out Octet Count |
|---|---|---|---|---|---|---|
| 1 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 2 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 3 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 4 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 5 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 6 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 7 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 8 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 9 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 10 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 11 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |
| 12 | AV541 12P-ADSL CELL Physical Port | 0 | Down | Down | 0 | 0 |

Close

Document: Done

# PHYSICAL SDSL FRAME INTERFACES





| Port | Interface Description | Speed | Admin Status | Operation Status | In Octet Count | In Discard Count | In Errored Pkt Count | Out Octet Count | Out Discard Count | Out Errored Pkt Count |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | AV421 24P-SDSL Physical Port | 768000 | Up | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | AV421 24P-SDSL Physical Port | 768000 | Up | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | AV421 24P-SDSL Physical Port | 768000 | Up | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | AV421 24P-SDSL Physical Port | 768000 | Up | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | AV421 24P-SDSL Physical Port | 768000 | Up | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | AV421 24P-SDSL Physical Port | 768000 | Up | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | AV421 24P-SDSL Physical Port | 768000 | Down | Down | 0 | 0 | 0 | 0 | 0 | 0 |

# PHYSICAL SDSL CELL INTERFACES

Physical Interfaces for SDSL Cell card in slot 9 - Avidia 8000, #32 - Netscape

PAIRGAIN Avidia 8000

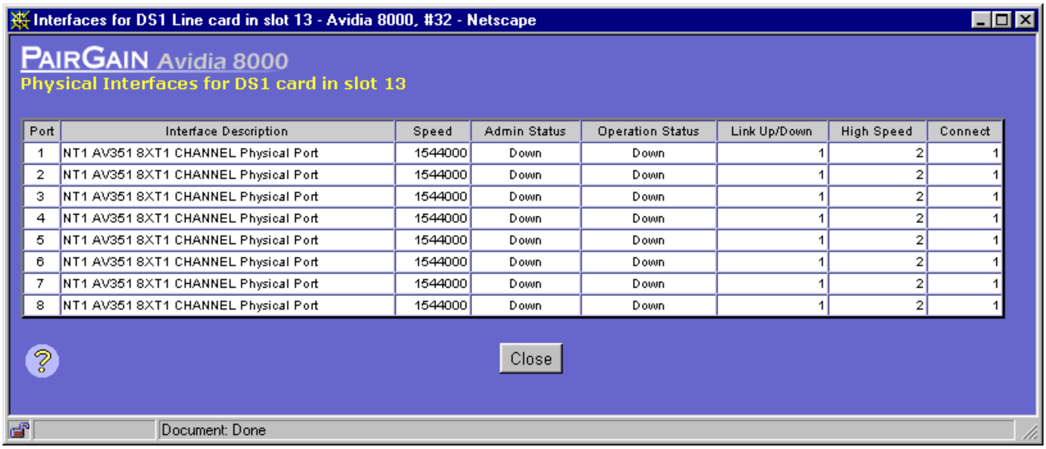
Physical Interfaces for SDSL Cell card in slot 9

| Port | Interface Description | Speed | Admin Status | Operation Status | In Octet Count | In Discard Count | In Errored Pkt Count | Out Octet Count | Out Discard Count | Out Errored Pkt Count |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | AV522 24P-SDSL CELL | 768 | Up | Down | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | AV522 24P-SDSL CELL | 784 | Down | Down | 53 | 0 | 0 | 53 | 0 | 0 |
| 3 | AV522 24P-SDSL CELL | 768 | Up | Down | 106 | 0 | 0 | 106 | 0 | 0 |
| 4 | AV522 24P-SDSL CELL | 768 | Up | Down | 159 | 0 | 0 | 159 | 0 | 0 |
| 5 | AV522 24P-SDSL CELL | 0 | Up | Down | 212 | 0 | 0 | 212 | 0 | 0 |
| 6 | AV522 24P-SDSL CELL | 0 | Up | Down | 265 | 0 | 0 | 265 | 0 | 0 |
| 7 | AV522 24P-SDSL CELL | 0 | Up | Down | 318 | 0 | 0 | 318 | 0 | 0 |
| 8 | AV522 24P-SDSL CELL | 0 | Up | Down | 371 | 0 | 0 | 371 | 0 | 0 |
| 9 | AV522 24P-SDSL CELL | 0 | Up | Down | 424 | 0 | 0 | 424 | 0 | 0 |
| 10 | AV522 24P-SDSL CELL | 0 | Up | Down | 477 | 0 | 0 | 477 | 0 | 0 |
| 11 | AV522 24P-SDSL CELL | 0 | Up | Down | 530 | 0 | 0 | 530 | 0 | 0 |
| 12 | AV522 24P-SDSL CELL | 0 | Up | Down | 583 | 0 | 0 | 583 | 0 | 0 |
| 13 | AV522 24P-SDSL CELL | 0 | Up | Down | 636 | 0 | 0 | 636 | 0 | 0 |
| 14 | AV522 24P-SDSL CELL | 0 | Down | Down | 689 | 0 | 0 | 689 | 0 | 0 |
| 15 | AV522 24P-SDSL CELL | 0 | Up | Down | 742 | 0 | 0 | 742 | 0 | 0 |
| 16 | AV522 24P-SDSL CELL | 0 | Up | Down | 795 | 0 | 0 | 795 | 0 | 0 |
| 17 | AV522 24P-SDSL CELL | 0 | Up | Down | 848 | 0 | 0 | 848 | 0 | 0 |
| 18 | AV522 24P-SDSL CELL | 0 | Up | Down | 901 | 0 | 0 | 901 | 0 | 0 |
| 19 | AV522 24P-SDSL CELL | 0 | Up | Down | 954 | 0 | 0 | 954 | 0 | 0 |
| 20 | AV522 24P-SDSL CELL | 0 | Up | Down | 1007 | 0 | 0 | 1007 | 0 | 0 |
| 21 | AV522 24P-SDSL CELL | 0 | Up | Down | 1060 | 0 | 0 | 1060 | 0 | 0 |
| 22 | AV522 24P-SDSL CELL | 0 | Up | Down | 1113 | 0 | 0 | 1113 | 0 | 0 |
| 23 | AV522 24P-SDSL CELL | 0 | Up | Down | 1166 | 0 | 0 | 1166 | 0 | 0 |
| 24 | AV522 24P-SDSL CELL | 0 | Up | Down | 1219 | 0 | 0 | 1219 | 0 | 0 |

Close

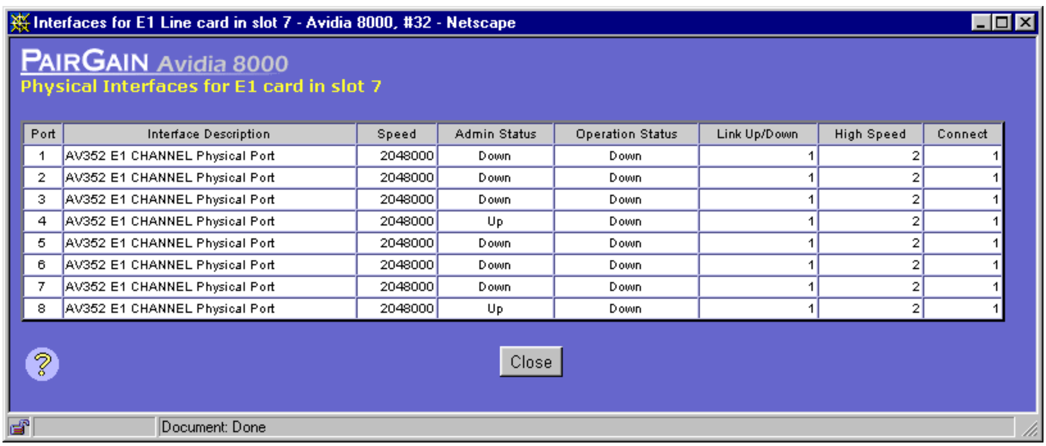
Document: Done

# PHYSICAL DS1 INTERFACES



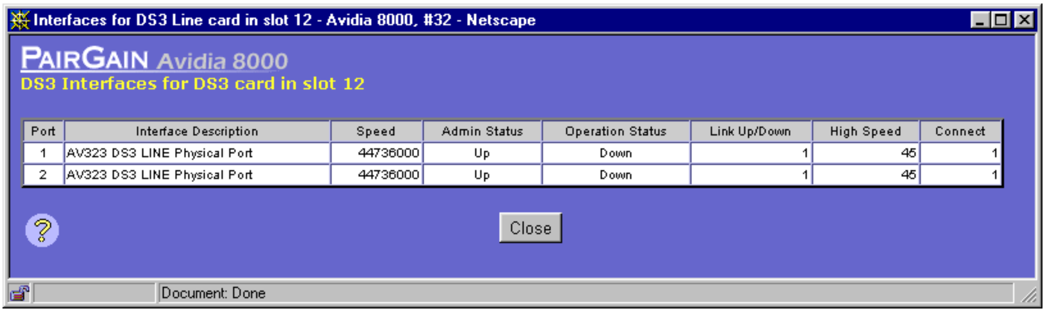

| Port | Interface Description | Speed | Admin Status | Operation Status | Link Up/Down | High Speed | Connect |
|---|---|---|---|---|---|---|---|
| 1 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |
| 2 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |
| 3 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |
| 4 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |
| 5 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |
| 6 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |
| 7 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |
| 8 | NT1 AV351 8XT1 CHANNEL Physical Port | 1544000 | Down | Down | 1 | 2 | 1 |

# PHYSICAL E1 INTERFACES




| Port | Interface Description | Speed | Admin Status | Operation Status | Link Up/Down | High Speed | Connect |
|---|---|---|---|---|---|---|---|
| 1 | AV352 E1 CHANNEL Physical Port | 2048000 | Down | Down | 1 | 2 | 1 |
| 2 | AV352 E1 CHANNEL Physical Port | 2048000 | Down | Down | 1 | 2 | 1 |
| 3 | AV352 E1 CHANNEL Physical Port | 2048000 | Down | Down | 1 | 2 | 1 |
| 4 | AV352 E1 CHANNEL Physical Port | 2048000 | Up | Down | 1 | 2 | 1 |
| 5 | AV352 E1 CHANNEL Physical Port | 2048000 | Down | Down | 1 | 2 | 1 |
| 6 | AV352 E1 CHANNEL Physical Port | 2048000 | Down | Down | 1 | 2 | 1 |
| 7 | AV352 E1 CHANNEL Physical Port | 2048000 | Down | Down | 1 | 2 | 1 |
| 8 | AV352 E1 CHANNEL Physical Port | 2048000 | Up | Down | 1 | 2 | 1 |

# PHYSICAL DS3 INTERFACES




| Port | Interface Description | Speed | Admin Status | Operation Status | Link Up/Down | High Speed | Connect |
|---|---|---|---|---|---|---|---|
| 1 | AV323 DS3 LINE Physical Port | 44736000 | Up | Down | 1 | 45 | 1 |
| 2 | AV323 DS3 LINE Physical Port | 44736000 | Up | Down | 1 | 45 | 1 |

# MONITORING SYSTEM ALARMS AND STATUS 28

This chapter describes how to monitor system alarms and messages from the Web interface.

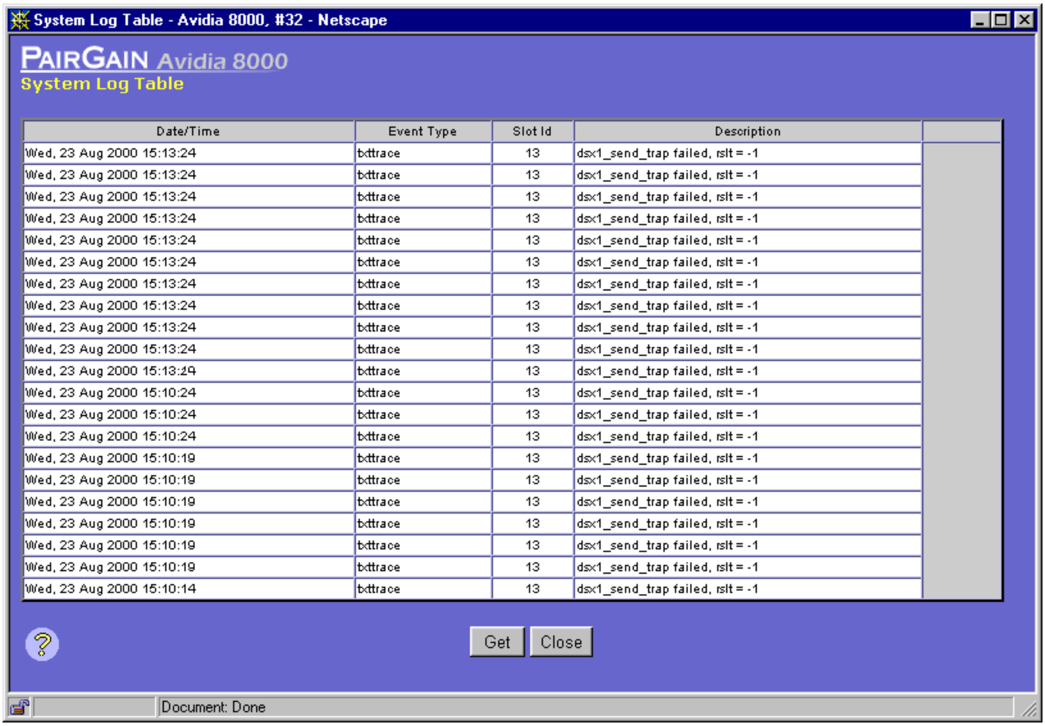
# MONITORING SYSTEM EVENTS

The **System Log** reports events that occur on all cards installed in the chassis. Reported events include alarms, traps, changes in slot status and diagnostic trace messages.

**1** Do one of the following to display the **System Log Table** window.

- In the **Site Map Navigation** window, click **System Log**.
- In the **Tree Navigation** window, click **Alarm**, **System Log**.

**2** Click and if necessary to view the entire **System Log Table**. displays the beginning of the table. displays the next page of the table.




| Date/Time | Event Type | Slot Id | Description |
|---|---|---|---|
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:13:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:24 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:19 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:19 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:19 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:19 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:19 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:19 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |
| Wed, 23 Aug 2000 15:10:14 | txtrace | 13 | dsx1_send_trap failed, rslt = -1 |

**3** If desired, click **Get** to refresh the **System Log Table**.

The **System Log Table** window provides the following information:

| Information | Description |
|---|---|
| Date/Time | The time and date the event occurred. |
| Event Type | The type of event that occurred. Options:<br>• **alarm**—Displays when an alarm has occurred or been cleared.<br>• **trap**—Displays when a trap has been sent.<br>• **bintrace**—Displays when a binary trace has been sent. This information is for technician use only.<br>• **txttrace**—Displays additional details regarding about the sent traps. This information is for technician use only. |
| Slot ID | The slot associated with the event. |
| Description | A description of the event that occurred. The description is reported by the alarm manager as follows:<br>• Alarms—Reports the alarm severity, Alarm ID and description as obtained from the alarm description database.<br>• Trap—Reports the detailed description of the trap as obtained from the alarm description database.<br>• Bintrace—Reports the text of the binary message that was sent. This information is for technician use only.<br>• Txttrace—Reports the specific change that has occurred in the slot. This information is for technician use only. |

# MONITORING SYSTEM ALARMS

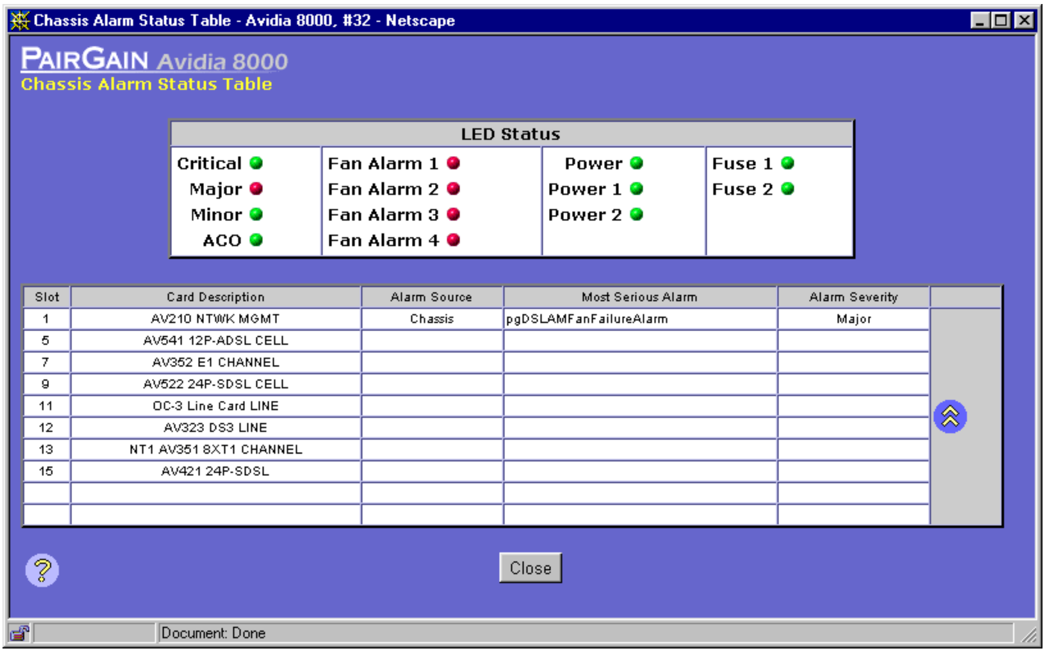
The **Chassis Alarm Status Table** window displays the alarm status for all components of the Avidia system.

**1** Do one of the following:

- In the **Site Map Navigation** window, click **Chassis Alarm Status**.
- In the **Tree Navigation** window, click **Alarm**, **Chassis Alarm Status**.

The **Chassis Alarm Status Table** window displays.

**2** Click and if necessary to view the entire **Chassis Alarm Status Table**. displays the beginning of the table. displays the next page of the table.



The **Chassis Alarm Status Table** window provides the following information:

| Information | Description |
|---|---|
| LED Status | Displays a graphical representation of the current chassis LED status. Green indicates there is no alarm. Red indicates an alarm. When red, the LEDs correspond to the following:<br>• Critical—A critical alarm has occurred somewhere in the system.<br>• Major—A major alarm has occurred somewhere in the system.<br>• Minor—A minor alarm has occurred somewhere in the system.<br>• Audio Alarm—An audio alarm has occurred somewhere in the system.<br>• Fan Alarm 1—Chassis fan 1 has failed.<br>• Fan Alarm 2—Chassis fan 2 has failed.<br>• Fan Alarm 3—Chassis fan 3 has failed.<br>• Fan Alarm 4—Chassis fan 4 has failed.<br>• Power—One of the chassis power inputs is down.<br>• Power 1—Chassis power input 1 is down.<br>• Power 2—Chassis power input 2 is down.<br>• Fuse 1—Chassis fuse 1 is blown (not yet implemented).<br>• Fuse 2—Chassis fuse 2 is blown (not yet implemented). |
| Slot | The slot in which the alarm occurred. |
| Card Description | The description of the card on which the alarm occurred. |
| Alarm Source | The location from which the alarm was generated. |

| Information | Description |
|---|---|
| Most Serious Alarm | The most serious alarm that is occurring in the corresponding slot. The currently supported alarms are:<br>**Chassis Alarms—critical**<br>• Chassis power alarm—One or more chassis power inputs is down.<br>• Chassis fan failure—One or more of the four chassis fans is down.<br>• Chassis temperature alarm—The chassis temperature has exceeded the allowable threshold. This threshold is not user configurable.<br>• Chassis line card down alarm—The management card cannot communicate with the line card.<br>• Chassis cell bus down alarm—The cell bus is not operational.<br>**ADSL Alarms—minor**<br>• ADSL Loss of Frame (ATU-C/ATU-R)—The Loss of Framing 15 minute interval threshold has been exceeded.<br>• ADSL Loss of Signal (ATU-C/ATU-R)—The Loss of Signal 15 minute interval threshold has been exceeded.<br>• ADSL Errored Seconds (ATU-C/ATU-R)—The Errored Seconds 15 minute interval threshold has been exceeded.<br>• ADSL RLPRs (Loss of Power) (ATU-C/ATU-R)—Either the ATU-C or ATU-R has lost power.<br>• ADSL Rate Change (ATU-C/ATU-R)—The actual rate is different than the configured rate.<br>• ADSL Initialization Failure Trap (ATU-C/ATU-R)—ADSL line initialization failed. |
| Alarm Severity | The severity of the most serious alarm that is occurring. |

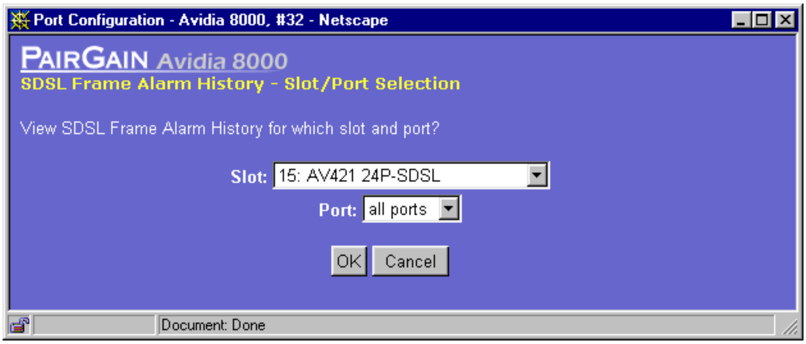
# MONITORING SDSL FRAME ALARMS

You can monitor current SDSL frame alarm status and SDSL frame alarm history.

**1** Do one of the following:

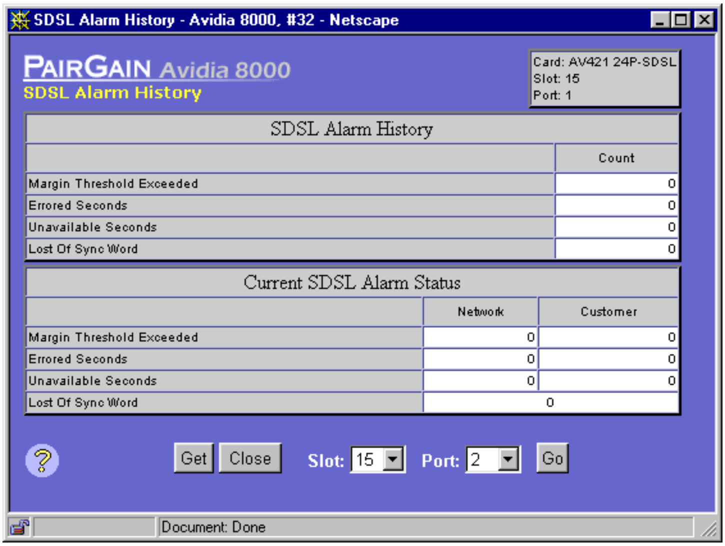
- In the **Site Map Navigation** window, click **SDSL Frame Alarm**.
- In the **Tree Navigation** window, click **Alarm**, **SDSL Frame Alarm**.

The **SDSL Alarm History Slot/Port Selection** window displays.




**2** Select the slot and port you want to monitor, then click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

The **SDSL Alarm History** window displays.




**3** In the **SDSL Alarm History** window, you can do any of the following:

- Click **Get** to refresh the window with current data.
- In the **Port** box, select another port to monitor, then click **Go**.
- In the **Slot** box, select another slot to monitor, then click **Go**.

The **SDSL Alarm History** window displays the following information for the selected port, including both alarm history (since the card was last reset) and alarm status for the current 15-minute data collection interval. The current alarm status displays for both the **Network** (upstream) and **Customer** (downstream) traffic.

| Information | Description |
|---|---|
| Card Description<br>Slot<br>Port | The description, slot and port of the card for which the alarm information is displayed. |
| Margin Threshold Exceeded | The number of seconds the actual margin exceeded the configured threshold. |
| Errored Seconds | The number of seconds during which errors occurred that prevented the payload from being corrected. |
| Unavailable Seconds | The number of seconds during which the line was unavailable. A line becomes unavailable at ten consecutive severely errored seconds. |
| Loss of Sync Word | The number of seconds during which one of the SDSL loops was out of sync. |

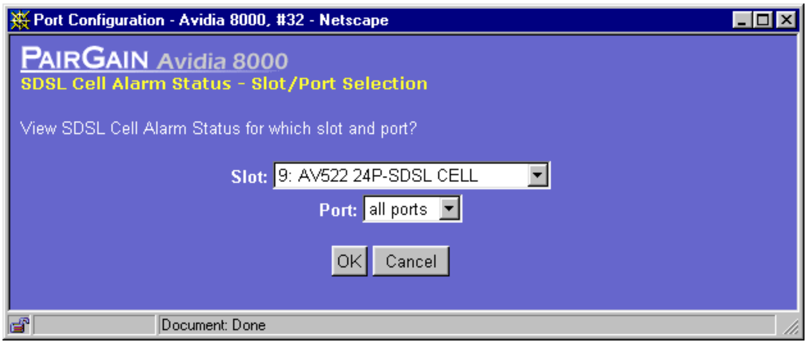
# Monitoring SDSL Cell Alarms

You can monitor current SDSL cell alarm status.

**1** Do one of the following:

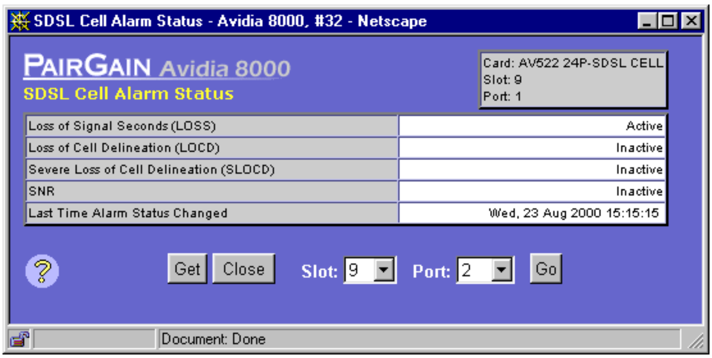
- In the **Site Map Navigation** window, click **SDSL Cell Alarm**.
- In the **Tree Navigation** window, click **Alarm**, **SDSL Cell Alarm Status**.

The **SDSL Cell Alarm** window displays.




2 Select the slot and port you want to monitor, then click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

The **SDSL Cell Alarm Status** window displays.




3 In the **SDSL Cell Alarm Status** window, you can do any of the following:

- Click **Get** to refresh the window with current data.
- Click **Go** to go to the selected Slot and Port

The **SDSL Cell Alarm Status** window displays the alarm status for the current 15-minute data collection interval. The current alarm status displays for both the **Network** (upstream) and **Customer** (downstream) traffic.

| Information | Description |
|---|---|
| Card Description<br>Slot<br>Port | The slot, port and description of the card for which the alarm information is displayed. |
| Loss of Signal Seconds (LOSS) | Loss of signal seconds are seconds during which the SDSL cell line is incapable of transmitting or receiving data and all data is lost. |
| Loss of Cell Delineation (LOCD) | Loss of cell delineation seconds are seconds in which some cells transmitted during that second were lost. |
| Severe Loss of Cell Delineation (SLOCD) | Severe loss of cell delineation seconds are seconds in which the total number of LOCD events in that second exceed 50% of the total bandwidth available during that second. During a severe loss of cell delineation second most of the cells transmitted during that second are lost. |
| SNR | SNR margin is a measure of signal quality indicating how much margin can be dropped before the number of bit errors exceeds the ratio of 1x10-7 errored bits per bits transmitted. |
| Last Time Alarm Status Changed | The last time the status of an alarm changed. |

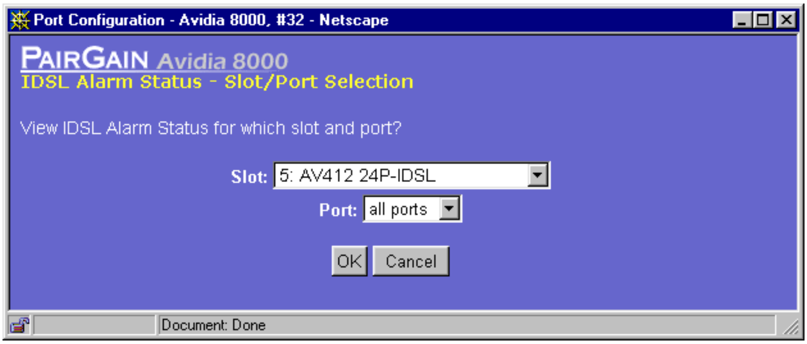
# MONITORING IDSL ALARM STATUS

The **IDSL Alarm Status** window displays a summary of the alarm data for a specified IDSL line and port.

**1** Do one of the following:

- In the **Site Map Navigation** window, click **IDSL Alarm Status**.
- In the **Tree Navigation** window, click **Alarm**, **IDSL Alarm Status**.

The **IDSL Alarm Status - Slot/Port Selection** window displays.

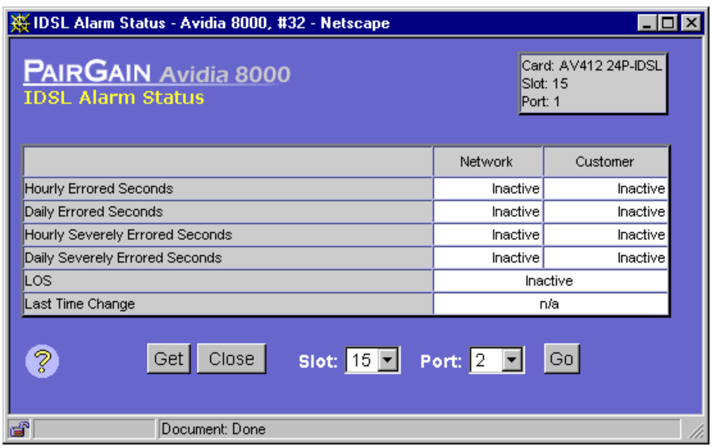



2 Select the slot and port you want to monitor.

3 To continue to the **IDSL Alarm Status** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.

4 In the **IDSL Alarm Status** window, you can do any of the following:

- Click **Get** to refresh the window with current data.
- In the **Port** box, select another port to monitor, then click **Go**.
- In the **Slot** box, select another slot to monitor, then click **Go**.



The **IDSL Alarm Status** window provides the following information. The alarm thresholds for errored seconds and severely errored seconds were configured using the **IDSL Alarm Configuration Profile Table** (see "Configuring IDSL Alarm Profiles" on page 408). **Network** indicates statistics for the upstream direction, toward the network. **Customer** indicates statistics for the downstream direction, toward the customer.

| Status Box | Description |
|---|---|
| Slot<br>Port<br>Card Description | The slot number, port number and description of the IDSL card for which alarm status is displayed. |
| Hourly Errored Seconds<br>(Network/Customer) | The Hourly Errored Seconds alarm status (Active or Inactive). |
| Daily Errored Seconds<br>(Network/Customer) | The Daily Errored Seconds alarm status (Active or Inactive). |
| Hourly Severely Errored Seconds<br>(Network/Customer) | The Hourly Severely Errored Seconds alarm status (Active or Inactive). |
| Daily Severely Errored Seconds<br>(Network/Customer) | The Daily Severely Errored Seconds alarm status (Active or Inactive). |
| LOS | The Loss Of Signal alarm status (Active or Inactive). An LOS alarm is reported when the signal is lost or when 40 consecutive ISDN frames are lost. |
| Last Time Change | The date and time the alarm status changed. |

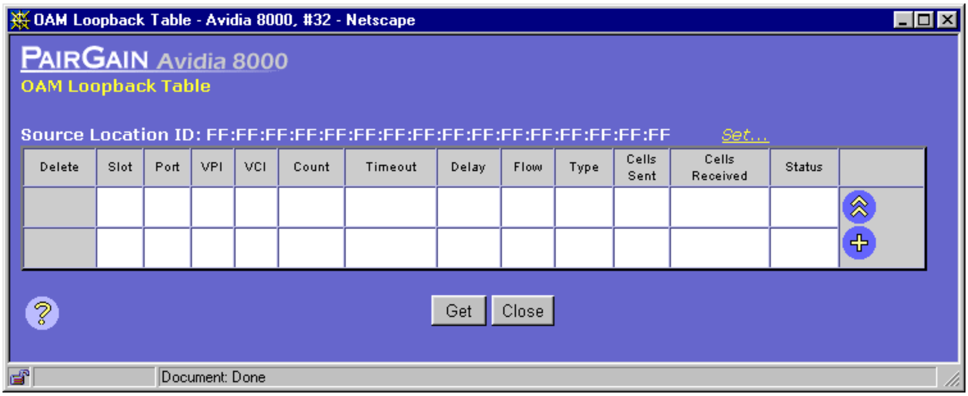
# SYSTEM MAINTENANCE AND ADMINISTRATION 29

The Web interface provides several convenient maintenance and administrative features. Go to the appropriate section listed below, based on the task you want to perform.

# CONFIGURING AND INITIATING OAM LOOPBACKS

Configure OAM Loopbacks from the **OAM Loopback Table** window. Do one of the following to open the **OAM Loopback Table** window:

- In the **Site Map Navigation** window, click **OAM Loopback**.
- In the **Tree Navigation** window, click **Diagnostics Management**, **OAM Loopback**.



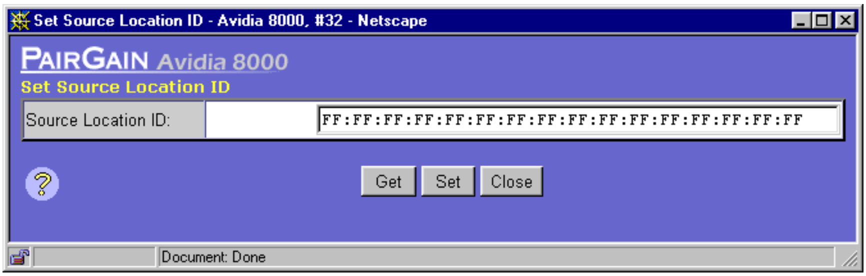
Click **Get** to update the **OAM Loopback Table** window. Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table. The OAM Loopback Table displays the following configuration and status information for each loopback.

| Information | Description |
|---|---|
| Slot<br>Port | The slot and port from which the loopback was initiated. |
| VPI | The VPI of the VPC or VCC. |
| VCI | The VCI of the VCC for an OAM F5 flow loopback. |
| Count | The configured total number of cells to be sent. |
| Timeout | The configured number of seconds allowed for the looped back cells to return to the originating device before the loopback is designated as failed. |
| Delay | The configured number of seconds the system waits between transmitted cells. |
| Flow | The type of loopback test that is run:<br>• **F4** loopback tests the circuit at a VPC level.<br>• **F5** loopback tests the circuit at a VCC level. |
| Type | The type of loopback in effect:<br>• **Segment** loopbacks test the connectivity between any two uniquely addressable points in a VPC (F4) or VCC (F5). See page 61 for a list of segment loopbacks supported.<br>• **End-to-End** loopbacks test the connectivity between any uniquely addressable point in the VPC (F4) or VCC (F5) and any end point (such as a modem or network end point) where a VPC or VCC terminates. See page 61 for a list of end-to-end loopbacks supported. |
| Cells Sent | The number of cells sent. |
| Cells Received | The number of cells received. |
| Status | The current status of the loopback. Options:<br>• **Null**—no loopback has been configured for this PVC.<br>• **In progress**—a loopback is currently in progress for this PVC.<br>• **Completed**—a loopback was sent and successfully completed for this PVC.<br>• **Aborted**—a loopback was sent but was aborted by the user.<br>• **Failed**—a loopback was sent but the cells were not received by the source.<br>• **Expired**—the status of loopbacks that are completed, aborted or failed changes to expired after the configured timeout value.The next time an entry is added to the OAM Loopback Table, the expired loopback entries are automatically deleted. |

From the OAM Loopback Table, set the Source Location ID for the Avidia system. This is important, as it enables the Avidia system to determine whether or not it is the originator of received loopback cells. The Source Location ID default is ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff. Set a unique ID prior to initiating a loopback, as other devices involved in the loopback could default to the same Location ID (see "ATM Device Addresses" on page 23 for more information about Locations IDs). It is recommended that the OAM Source Location ID address for the Avidia system is set up with:

- a unique address that is meaningful to you for the first 13 octets
- all zeros for the last three octets

1 In the **OAM Loopback Table** window, click **Set** to display the **Set Source Location ID** window.




2 In the Source Location ID box, type the OAM Location ID (format *xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx* where *x* is an integer 0 - 9 or an alpha character a - f).

It is recommended to use 13-octet network prefix for the Avidia system followed by 00:00:00 for the Source Location ID.

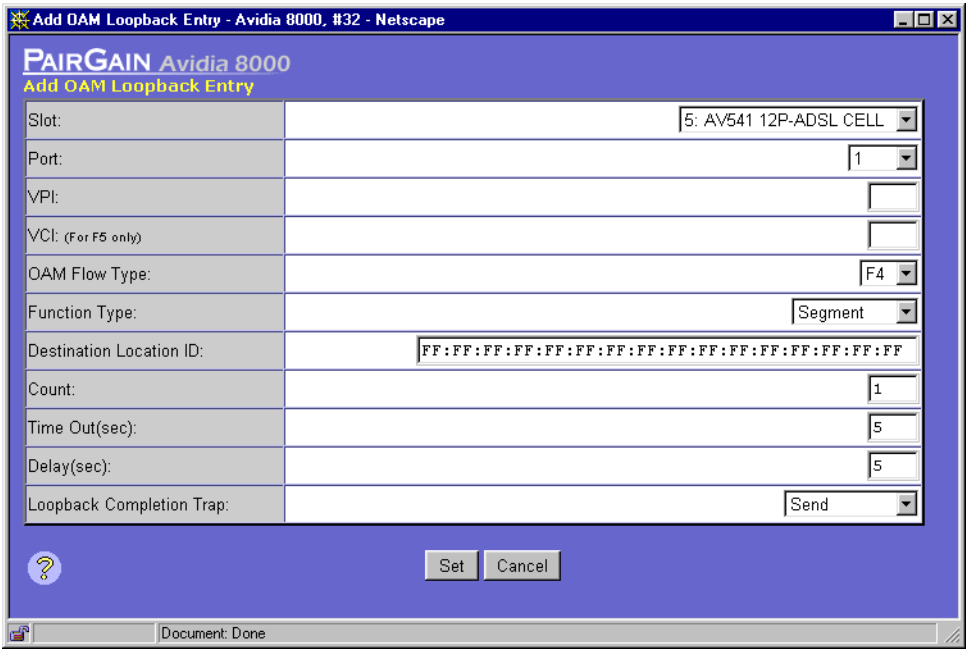
3 Do one of the following:

- Click **Get** to cancel the new address. You can only cancel the new address if you have not clicked **Set**.
- Click **Set** to save the new address.

## Adding OAM Loopbacks

**1** In the **OAM Loopback Table** window, click .

The **Add OAM Loopback Entry** window displays.




**2** In the **Slot** and **Port** boxes, select the slot and port where the loopback will be initiated.

**3** In the **OAM Flow Type** box, select either **F4** or **F5**.

OAM F4 flow loopbacks test circuits at a VPC level (requires a VPI only), where OAM F5 flow loopbacks test circuits at a VCC level (requires a VPI and a VCI).

**4** In the **VPI** and **VCI** boxes, do one of the following:

- For an OAM Flow Type F4 loopback, type the VPI for the VPC.
- For an OAM Flow Type F5 loopback, type the VPI and VCI for the VCC.

5 In the **Function Type** box, select the loopback type (**Segment** or **End-To-End**).

Segment loopbacks test the connectivity between any two uniquely addressable points in a VPC or VCC.

End-to-end loopbacks test the connectivity between any uniquely addressable point in the VPC or VCC and any end point (such as a modem or a network end point) where a VPC or VCC terminates.

6 In the **Destination Location ID** box, type the OAM Location ID of the target device where the cells will be looped back to the originating device (format *xx:xx:xx:xx:xx:xx:xx:xx: xx:xx:xx:xx:xx:xx:xx:xx* where *x* is an integer 0 - 9 or an alpha character a - f). It is not necessary to modify this value when you perform a loopback test to a Megabit Modem.

7 In the **Count** box, type the total number of cells to be sent in the loopback (cells are sent one at a time).

8 In the **Time Out (sec)** box, type the number of seconds allowed for the looped back cells to return to the originating device before the loopback is designated as failed.

9 In the **Delay (sec)** box, type the number of seconds the system to waits between transmitted cells.

10 In the **Loopback Completion Trap** box, select **Send** to send a trap when the loopback is completed or select **Do Not Send** if you do not want the management card to send a trap.

11 Do one of the following:

- To activate the settings and close the **Add OAM Loopback Entry** window, click **Set**, then in the confirmation dialog click **Back**.
- To return to the **OAM Loopback Table** window without deleting the table entry, click **Cancel**.

### Deleting OAM Loopbacks

**1** Locate the table row that contains the **OAM Loopback Table** entry you want to delete.

Click and if necessary to view the entire table. displays the beginning of the table. displays the next page of the table.

**2** Click next to the row that contains the information you want to delete.

A confirmation dialog displays.

**3** Do one of the following:

- Click **Delete** to delete the selected table entry, then in the confirmation dialog click **Back** to return to the **OAM Loopback Table** window.
- Click **Cancel** to return to the **OAM Loopback Table** window without deleting the table entry.

## INITIATING COMMUNICATION PATH LOOPBACKS

The Avidia system supports loopbacks that enable you to test the data communication path between a card in the Avidia system and another device with the same transmission. You can run these loopbacks on DS1/DSX-1, DS3, and OC3 lines. Definitions of end-points for these tests include the near-end which is the local Avidia card and the far-end which is the device (this could be another Avidia card) that is the remote end for the test.

When you initiate a loopback test on a data communication path, normal service is interrupted for that path until the test is cancelled. The system is then returned to normal operation.

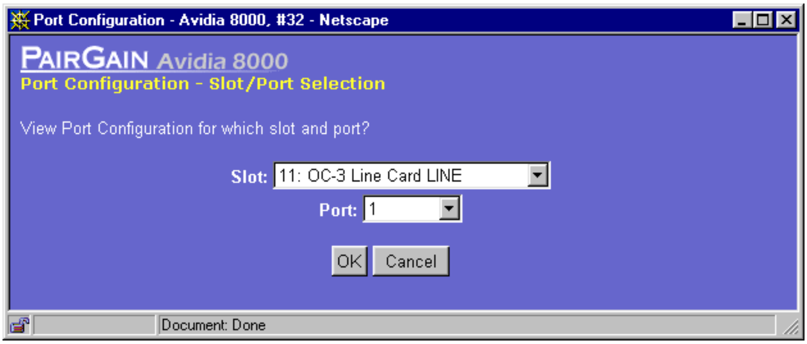
The following table lists supported loopbacks.

| **Loopback Type** | **Card(s) Supported** | **Description** |
|---|---|---|
| Local | OC3<br>DS1<br>DS3 | For this loopback, the signal is looped back within the line card at the transceiver. |
| Line | OC3<br>DS1/DSX-1<br>DS3 | For this loopback, the signal is received at the line interface and is looped back through the transmitter. The near-end interface receives the loopback from the far-end device. You can activate this test either from the near-end or far-end.<br>A line loopback tests the complete signal for the port, including channels that are blocked by the user. |
| Payload | DS1/DSX-1 | For this loopback, framing for the DS1/DSX-1 port must be set to ESF. The DS1/DSX-1 card loops the payload (192 bits) through the receive section (including the framer) and to the transmit section, returning the payload and the newly generated ESF framing. |
| Remote | DS1/DSX-1<br>DS3 | For this loopback, the signal is sent to the far-end where it is looped back. This loopback tests the entire data path to the far-end. |

Initiate loopbacks from the **OC3 Configuration**, **DS1 Configuration** or **DS3 Configuration** window, depending on the type of card. To open the configuration window for the card:

**1** Do one of the following to open the **Port Configuration - Slot/Port Selection** window:

- In the **Site Map Navigation** window, click **Port Configuration**.
- In the **Tree Navigation** window, click **Configuration Management**, **Service Provisioning**, **Port Configuration**.



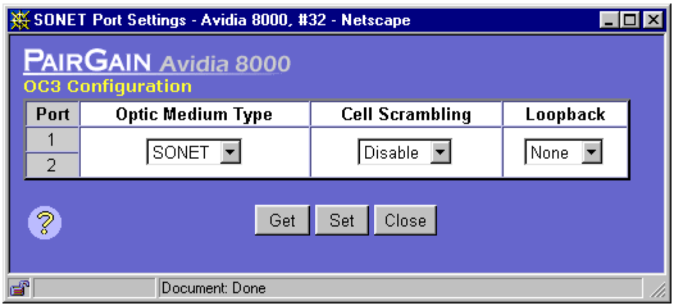
2 Select the slot and port on which you want to initiate a loopback, then click **OK**.

See the following sections to initiate loopbacks for specific line card types:


- "OC3 Loopbacks" on page 565
- "DS1 Loopbacks" on page 566
- "DS3 Loopbacks" on page 567


## OC3 Loopbacks

Initiate OC3 loopbacks from the **OC3 Configuration** window.



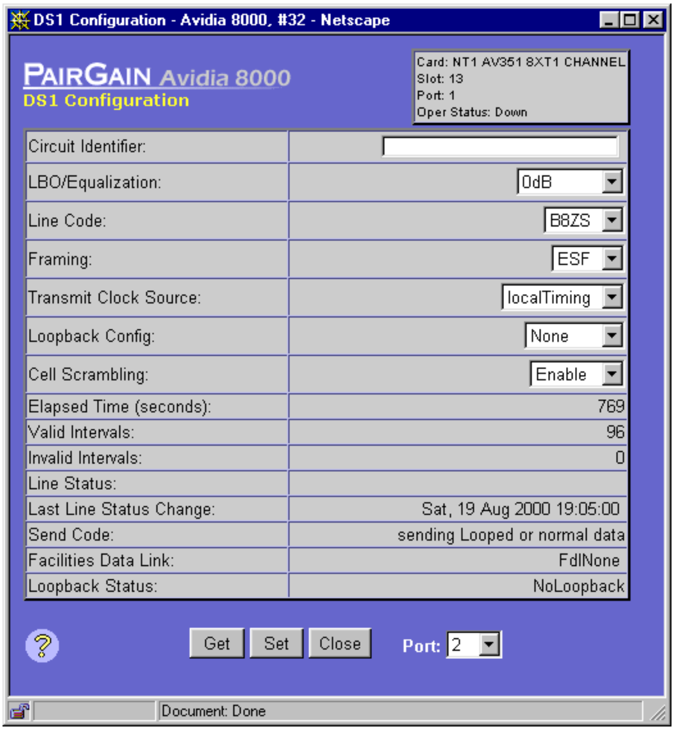

1 In the Loopback box, select the loopback type you want to initiate, either **Local** or **Line**. The table on page 564 describes these loopbacks.

2 Click **Set** to initiate the loopback.

To disable the loopback and return the port to normal service, set the **Loopback** box to **None** and click **Set**.

## DS1 Loopbacks

Initiate DS1 loopbacks from the **DS1 Configuration** window.




1 In the Loopback box, select the loopback type you want to initiate, either **Payload**, **Line**, **Remote**, or **Local**. The table on page 564 describes these loopbacks.

2 Click **Set** to initiate the loopback.

To disable the loopback and return the port to normal service, set the **Loopback** box to **None** and click **Set**.

# DS3 Loopbacks

Initiate DS3 loopbacks from the **DS3 Configuration** window.


1 In the Loopback box, select the loopback type you want to initiate, either **Payload**, **Line**, **Remote**, or **Local**. The table on page 564 describes these loopbacks.

2 Click **Set** to initiate the loopback.

To disable the loopback and return the port to normal service, set the **Loopback** box to **None** and click **Set**.

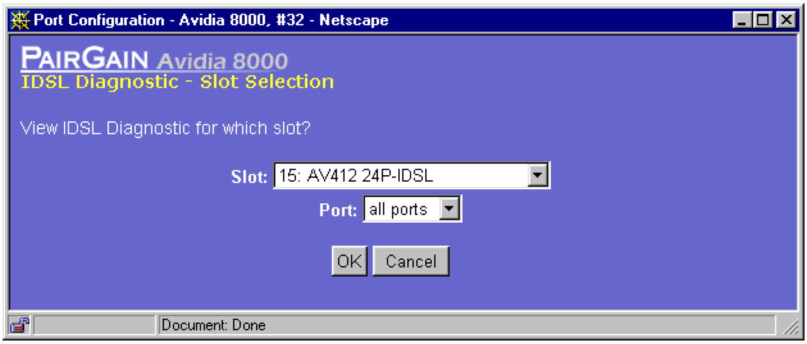
# MANAGING IDSL DIAGNOSTICS

You use the **IDSL Diagnostic Table** to enable IDSL loopbacks and run a corrupted CRC test for a node or the entire connection path (loop).

**1** Do one of the following:

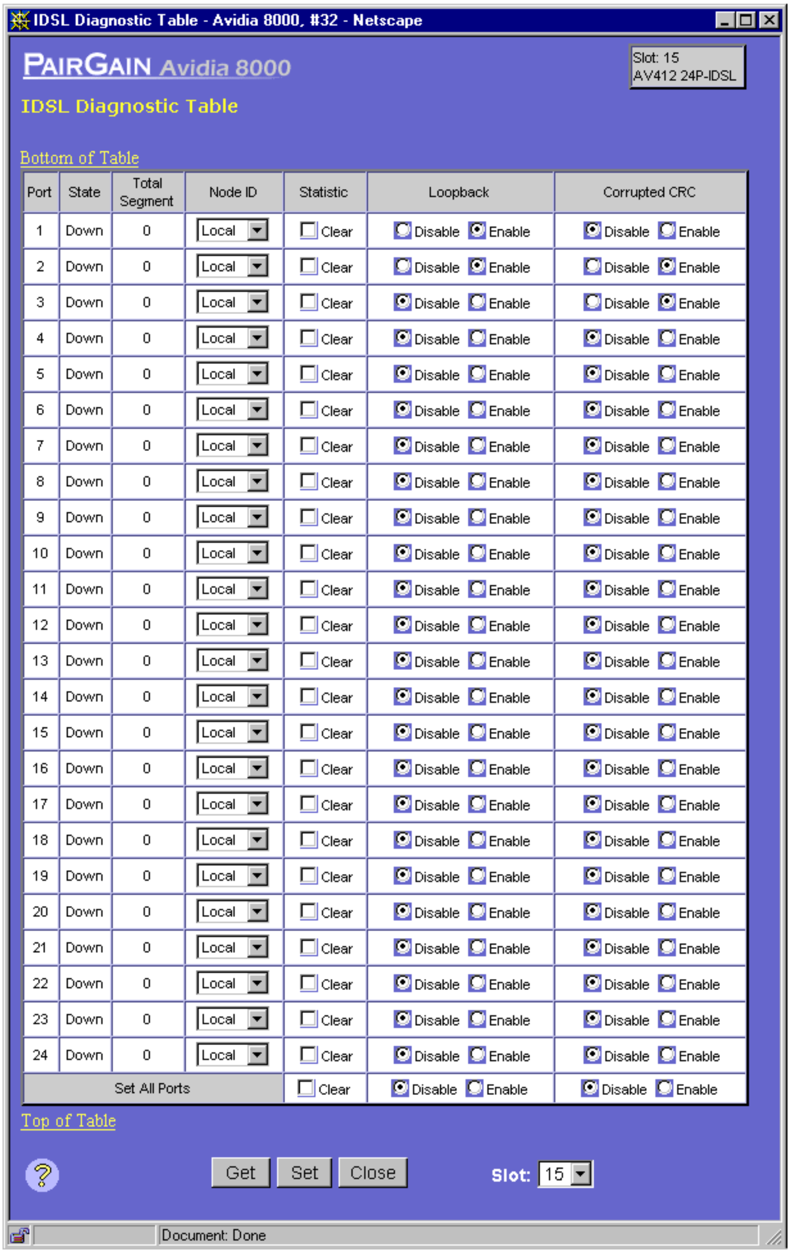
- In the **Site Map Navigation** window, click **IDSL Diagnostic**.
- In the **Tree Navigation** window, click **Diagnostic Management**, **IDSL Diagnostic**.

The **IDSL Diagnostic - Slot Selection** window displays.




**2** Select the slot you want to manage.

**3** To continue to the **IDSL Diagnostic** window, click **OK**. Otherwise, click **Cancel** to discontinue this procedure.



IDSL Diagnostic Table - Avidia 8000, #32 - Netscape

PAIRGAIN Avidia 8000

Slot: 15
AV412 24P-IDSL

IDSL Diagnostic Table

Bottom of Table

| Port | State | Total Segment | Node ID | Statistic | Loopback | Corrupted CRC |
|---|---|---|---|---|---|---|
| 1 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 2 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 3 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 4 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 5 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 6 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 7 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 8 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 9 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 10 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 11 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 12 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 13 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 14 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 15 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 16 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 17 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 18 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 19 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 20 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 21 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 22 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 23 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| 24 | Down | 0 | Local | Clear | Disable Enable | Disable Enable |
| Set All Ports | | | | Clear | Disable Enable | Disable Enable |

Top of Table

Get Set Close Slot: 15

Document: Done

**4** In the **IDSL Diagnostic** window, you can do any of the following:

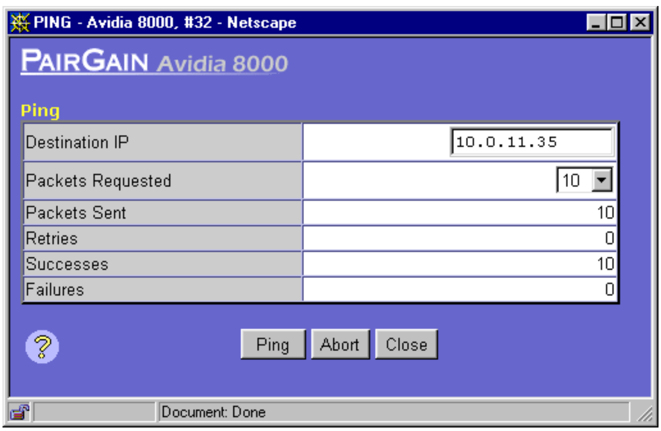
- Click **Set** to activate the new settings.
- Click **Get** to cancel the new settings. You can only cancel the settings if you have not clicked **Set**.
- In the **Slot** box, select another slot to manage.

# DETECTING NETWORK DEVICES

Use the **Ping** window to detect whether a network device is online. When you issue a **Ping** command, an IP packet is sent to the requested remote device. If the target device receives the packet, it sends a reply back to the Avidia system, indicating that the target is online.

**1** Do one of the following to open the **Ping** window:

- In the **Site Map Navigation** window, click **Ping**.
- In the **Tree Navigation** window, click **Diagnostics Management**, **PING**.




**2** In the **Destination IP** box, type the IP address of the network device you want to detect, in *xxx.xxx.xxx.xxx* format.

**3** Set the **Packets Requested** box to the number of ping packets to be sent to the remote address, one of the following: **1**, **3**, **5**, **10**, or **20**.

**4** Click **Ping**.

The **Ping** window displays one of the following messages (where *xxx.xxx.xxx.xxx* is the IP address of the target network device:

| Message | Description |
|---|---|
| *xxx.xxx.xxx.xxx* is alive. | The target device is online. |
| No answer from *xxx.xxx.xxx.xxx*. | The target device is not responding. |
| Ping *xxx.xxx.xxx.xxx* -- 5 second time out occurred. | The target device will be pinged again in five seconds. |
| *xxx.xxx.xxx.xxx* statistics: *??*% loss | The percentage (where *??* is the percentage) of ping packets that were not sent successfully to the target device. |

The **Ping** window also displays the following statistics:

| Information | Description |
|---|---|
| Packet Sent | The total number of ping packets sent to the remote address. |
| Retries | The number of ping packets that were resent. |
| Successes | The number of ping packets sent successfully to the remote address. |
| Failures | The number of ping packets that were not sent successfully to the remote address. |

# MANAGING IMAGE FILES

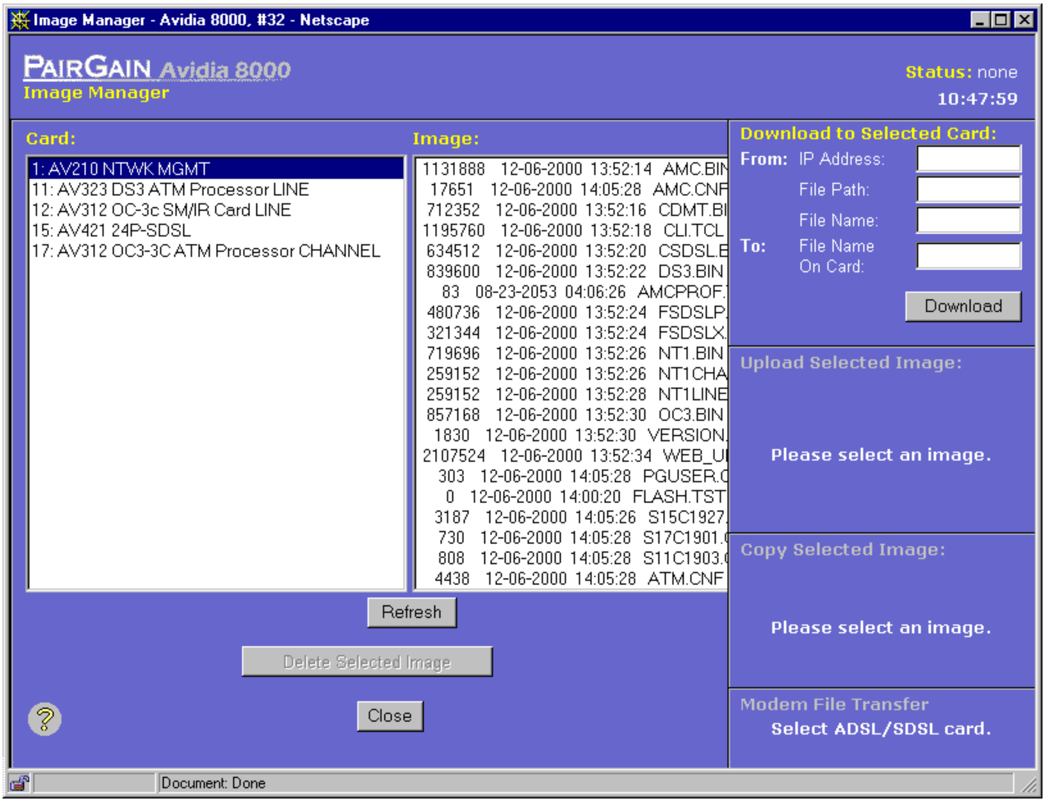
In the **Image Manager** window, you can download, upload, copy and delete Avidia system files. It is recommended that you upload a copy of all configuration files to a TFTP server, so that you can easily download and restore them if they get corrupted.

To open the **Image Manager** window, do one of the following:

- In the **Site Map Navigation** window, click **Image Manager**.
- In the **Tree Navigation** window, click **System Maintenance**, **Image Manager**.

## Uploading Files to a TFTP Server

You can backup Avidia system files by uploading them to a TFTP server.




1 Make sure the system to which you want to upload the file is running as a TFTP server.

2 In the **Image Manager** window **Card** box, click the card from which you want to upload files.

A list of files stored on the selected card displays in the **Image** box.

3 Select the file you want to upload.

The **Upload Selected Image** boxes display.

4 In the **To: IP Address** box, type the IP address of the TFTP server to which you want to upload the code image, using the *xxx.xxx.xxx.xxx* format.

The default TFTP server IP address is 192.168.0.100.

**5** To store the uploaded file in a TFTP server directory other than the default directory, type the target directory name in the **To: File Path** box.

You can only specify directory names that are subdirectories of the default directory. See your TFTP server documentation to determine the required path syntax.

**6** In the **To: File Name** box, type the file name you want to use to store the uploaded image file on the TFTP server, including file name extension.

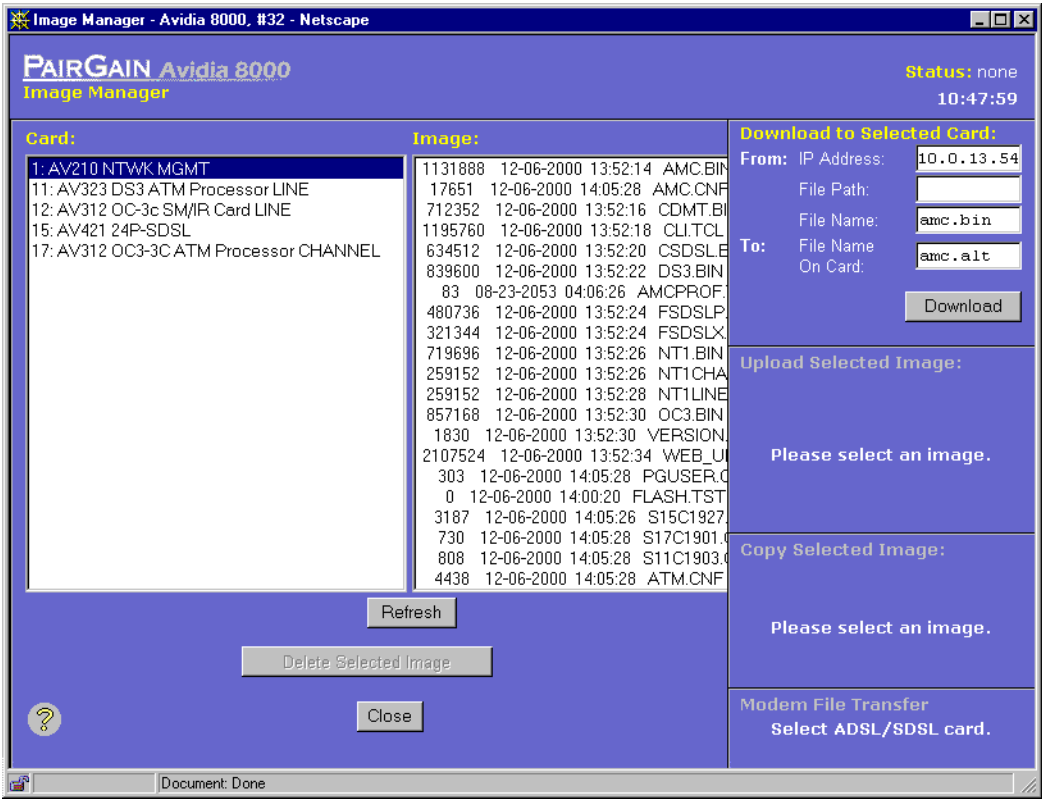
**7** To save the settings and begin the upload process, click **Upload**.

The selected file uploads to the specified TFTP server. You can monitor the upload progress in the **Status** field, located in the upper right corner of the **Image Manager** window. The **Status** field indicates whether the upload is **in progress**, was **successful**, or has **failed**. **None** indicates that no upload activity has taken place.

## Downloading Files to the Avidia System

You can restore Avidia system files by downloading the files from a TFTP server. Prior to downloading image files, it is recommended that you create a backup copy of your existing image file, using an .alt file name extension. See "Copying Files" on page 576 for instructions.

**When restoring files, be sure to download a complete set of system files to prevent version conflicts between files.**




1. In the **Image Manager** window **Card** box, click the card to which you want to download a file.

   The **Download to Selected Card** boxes display.

2. In the **From: IP Address** box, type the IP address of the TFTP server from which you want to download the file, using the *xxx.xxx.xxx.xxx* format.

   The default TFTP server IP address is 192.168.0.100.

3. If the file you want to download is not located in the TFTP server default directory, in the **From: File Path** box, type the directory in which the file is located.

   See your TFTP server documentation to determine the required path syntax.

4. In the **From: File Name** box, type the name of the file you want to download, including the file name extension.

5. In the **To: File Name on Card** box, type the file name you want to use to store the downloaded file on the selected card, including file name extension.

**6** To save the settings and begin the download process, click **Download**.

The selected file downloads to the specified card. You can monitor the download progress in the **Status** field, located in the upper right corner of the **Image Manager** window. The **Status** field indicates whether the download is **in progress**, was **successful**, or has **failed**. **None** indicates that no download activity has taken place.

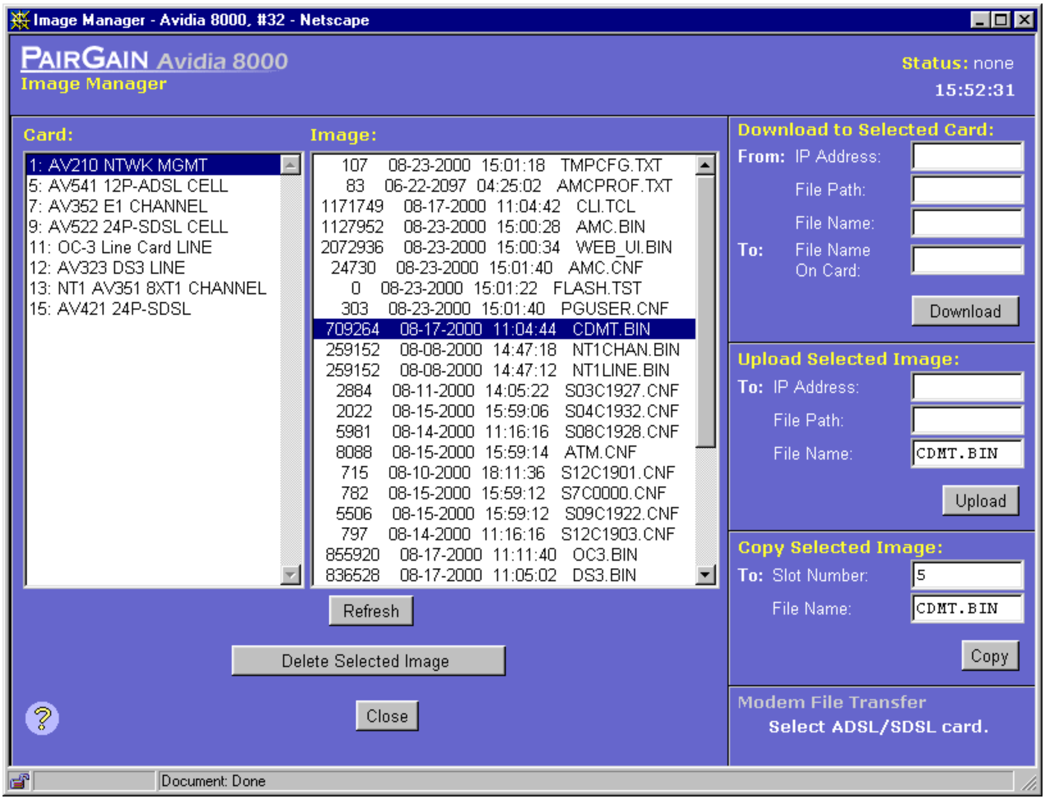
When the system downloads an image file, it changes the file name extension to .new until the file is booted and verified. When the download is complete, the file name displays in the **Image** box. You can also click **Refresh** to update the displayed data.

**7** Reset the card to which you downloaded the file to load the new file (unless you only downloaded the cli.tcl file). See "Resetting Cards" on page 589 for instructions.

The system attempts to boot the image file that has the .new file name extension. If the image file is valid, the system renames the file name extension to .bin and overwrites the previous image file. If the new image file is not valid, the system attempts to boot the image file that has the .bin file name extension. If that image file is not valid, the system boots the backup copy of the image file that has an .alt file name extension (if you created one). If the system cannot find a valid image file it loads the boot monitor, from which you can download a new image file, and the management card fault LED lights.

## Copying Files

You can restore the system files required to run a particular card by copying the files from another card of the same type.




1 In the **Image Manager** window **Card** box, click the card from which you want to copy files.

A list of files stored on the selected card displays in the **Image** box.

2 Select the file to copy.

The **Copy Selected Image** boxes display.

3 In the **To: Slot Number** box, type the slot number to which you want to copy the file.

4 In the **To: File Name** box, type the name, including file name extension, under which you want to store the copied file.

5 To save the settings and copy the file, click **Copy**.

You can monitor the copy progress in the **Status** field, located in the upper right corner of the **Image Manager** window. The **Status** field indicates whether the copy is **in progress**, was **successful**, or has **failed**. **None** indicates that no copy activity has taken place. When the copy is complete, the file name displays in the **Image** box. You can also click **Refresh** to update the displayed data.

### Deleting Files

1 In the **Image Manager** window **Card** box, click the card from which you want to delete files.

A list of files stored on the selected card displays in the **Image** box.

2 In the **Image** box, select the file you want to delete.

3 Click **Delete Selected Image**.

When the delete is complete, the file name no longer displays in the **Image** box. You can also click **Refresh** to update the displayed data.

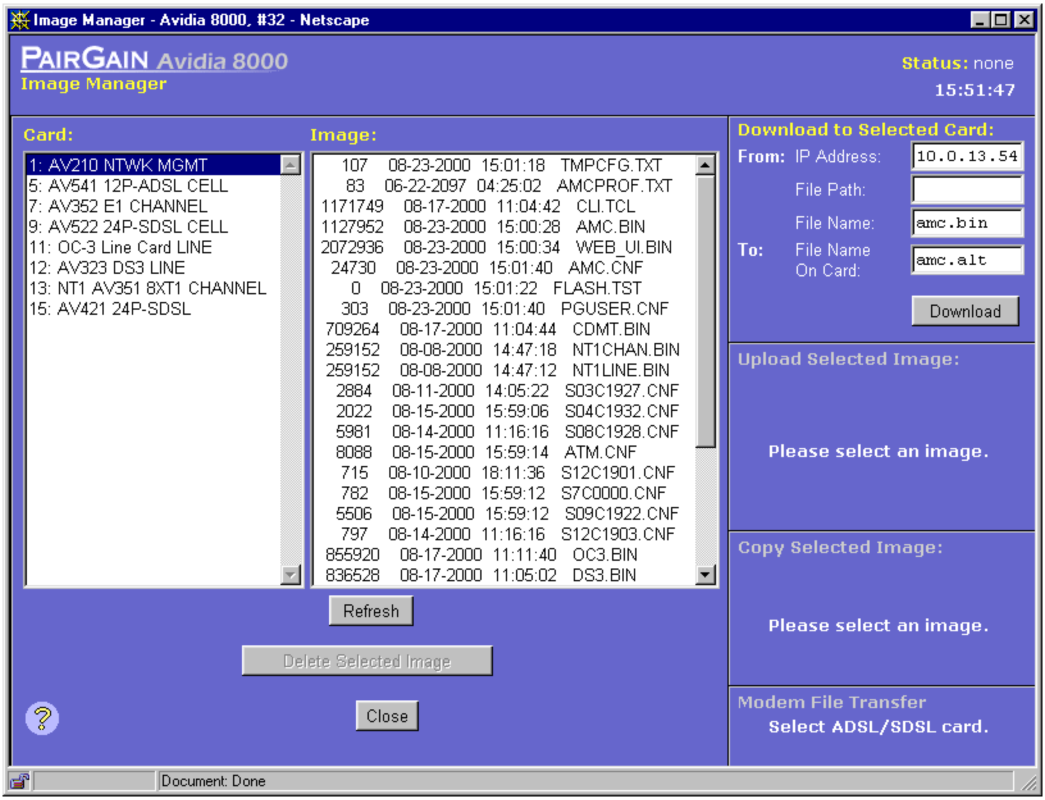
## DOWNLOADING FILES TO A MODEM

You can download files from an ADSL or SDSL channel card to one or more attached modems. While you can download a file to more than one modem simultaneously, you must download one file at a time. While one file is downloading, you can set up the next file to be downloaded. However, be sure that a download is not already in progress on a particular port before initiating a download on that port, otherwise the download will not take place.

You download files to a modem from the **Image Manager** window.

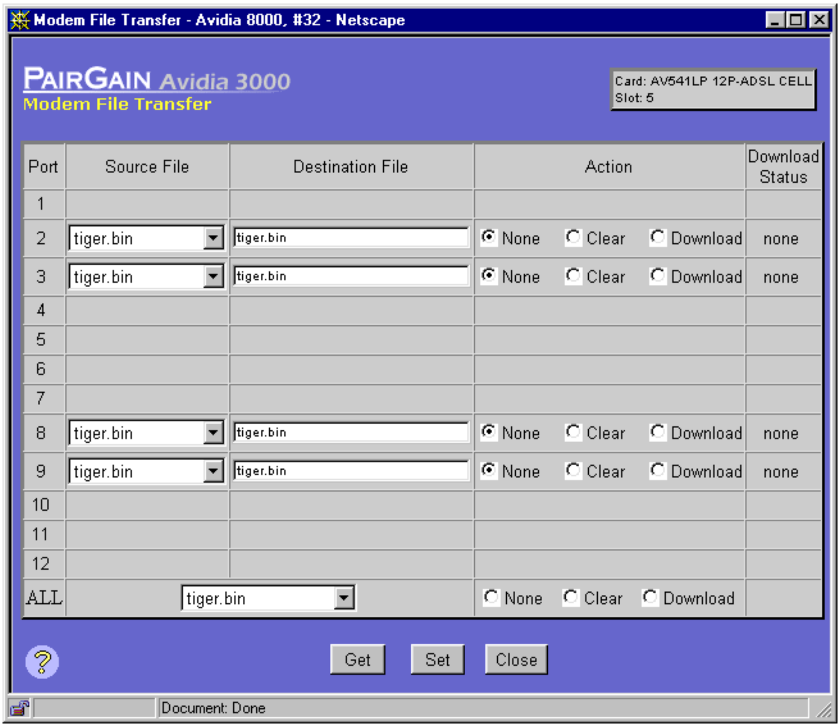
1 Do one of the following to open the **Image Manager** window:

- In the **Site Map Navigation** window, click **Image Manager**.
- In the **Tree Navigation** window, click **System Maintenance**, **Image Manager**.




2 In the **Card** box, select the channel card to which the modem is connected.

3 In the **Modem File Transfer** box, click **To Modem File Transfer** to open the **Modem File Transfer** window.




**4** For each channel card port over which you want to download files to the attached modem:

**a** In the corresponding **Source File** box select the file you want to download.

To download the same file to all of the ports, in the row labeled **ALL** select the file name. The file name for each of the individual ports is automatically set to the same file name.

When a source file is selected, the **Destination File** box automatically updates to reflect the file name required by the modem.

**Do not type a different name in the Destination File box. Typing a different name renames the file, which results in the modem being unable to locate the file.**

**b** In the **Action** column, select **Download**.

To download a file to all of the ports, in the row labeled **ALL** select **Download**. The action for the individual ports is automatically set to **Download**.

**5** For each channel card port over which you do not want to download files, in the **Action** column select **None**.

**6** To begin the download, click **Set**.

The **Modem File Transfer Status** window displays the current download status. The status is automatically updated every five seconds. You can also refresh the data by clicking **Refresh**.

The download progress is also reflected in the **Modem File Transfer** window **Status** box. To update the data, click **Get**.

**While one file is downloading, you can set up the next file to be downloaded. However, be sure that a download is not already in progress on a particular port before initiating a download on that port, otherwise the download will fail.**

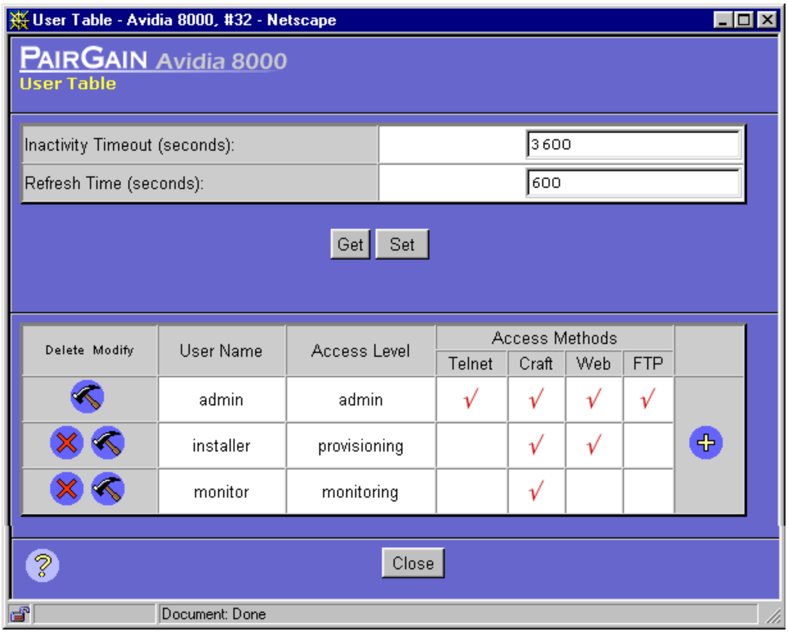
**7** To abort an in-progress download, select **Clear** next to that port, then click **Set**.

# MANAGING SECURITY

The Web interface comes with the user account *admin* and password *dslam* preconfigured. You can change the *admin* password, however you cannot delete the *admin* user account. You can add up to 19 additional user accounts, and configure the password, security level and access methods for each account. You can also modify user account information and delete user accounts.

Do one of the following to display the **User Table** window.

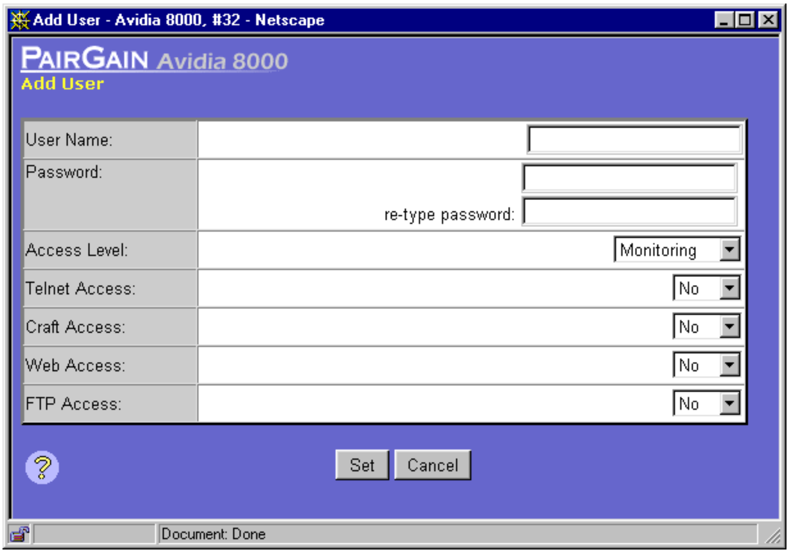
- In the **Site Map Navigation** window, click **User Table**.
- In the **Tree Navigation** window, click **System Maintenance**, **User Table**.




**You can also set the Inactivity Timeout and Refresh Time settings in the User Table window. See** **"Configuring the System Timers" on page 586** **for instructions.**

## Adding User Accounts

1 In the **User Table** window, click  to display the **Add User** window.




2 In the **User Name** box, type a unique user name for this account.

This is the name the user will use to log on to the Web interface. The user name must contain between four and 20 alphanumeric characters and the first character must be a letter. The user name cannot contain spaces, but can contain multiple words separated by an underscore.

3 In the **Password** box, type the password for this account.

The password must be between four and 16 alphanumeric characters and the first character must be a letter. The password cannot contain spaces, but can contain multiple words separated by an underscore.

4 In the **re-type password** box, re-type the password for this account.

**5** In the **Access Level** box, select the desired security level for this user.

| Access Level | View Information | Configure All Information Except User Accounts | Configure User Accounts |
|---|---|---|---|
| Monitoring | Yes | No | No |
| Provisioning | Yes | Yes | No |
| Admin | Yes | Yes | Yes |

**6** In the **Telnet Access** box, select **Yes** to enable the user to access the command-line interface using a Telnet session, otherwise select **No**.

**7** In the **Craft Access** box, select **Yes** to enable the user to access the command-line interface using the management card craft port, otherwise select **No**.

**8** In the **Web Access** box, select **Yes** to enable the user to access the Web interface, otherwise select **No**.

**9** In the **FTP Access** box, select **Yes** to enable the user to access the system for file management using FTP protocol, otherwise select **No**.

Only user accounts with Admin security level can be configured to allow FTP access.

**10** Do one of the following:

- To save the user account configuration, click **Set**, then in the confirmation box click **Back.**
- To close the **User Table** window without saving the user account information, click **Cancel**.

## Deleting User Accounts

**You cannot delete the admin user account.**

1 In the User Table window, click  next to the user account you want to delete.

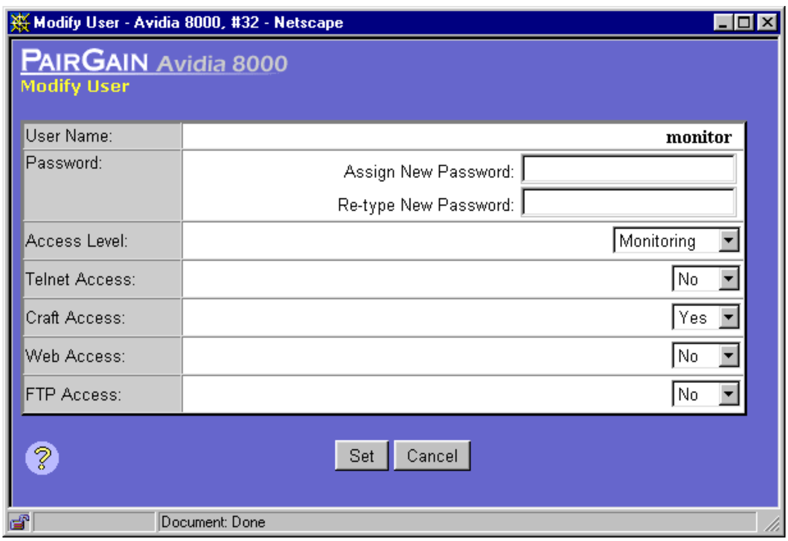
2 Do one of the following:

- In the confirmation box, click **Delete**, then in the confirmation message click **Back** to delete the user account.
- Click **Cancel** to return to the **User Table** window without deleting the user account.

## Modifying User Accounts

1 In the **User Table** window, click  next to the user account you want to modify.

The **Modify User** window displays.



2 To modify the user name, type a unique user name for this account In the **User Name** box.

This is the name the user will use to log on to the Web interface. The user name must contain between four and 20 characters and the first character must be a letter. The user name cannot contain spaces, but can contain multiple words separated by an underscore.

3 To modify the password, type the password for this account in the **Password** box.

The password must be between four and 16 alphanumeric characters and the first character must be a letter. The password cannot contain spaces, but can contain multiple words separated by an underscore.

4 If you modified the password, re-type the password for this account in the **re-type password** box.

5 To modify the access level, select the desired security level for this user in the **Access Level** box.

| Access Level | View Information | Configure All Information Except User Accounts | Configure User Accounts |
|---|---|---|---|
| Monitoring | Yes | No | No |
| Provisioning | Yes | Yes | No |
| Admin | Yes | Yes | Yes |

6 To modify access privileges, make the desired changes in the **Telnet Access**, **Craft Access**, **Web Access**, and **FTP Access** boxes.

**Yes** enables access. **No** disables access. Only user accounts with Admin security level can be configured to allow FTP access.

7 Do one of the following:

- Click **Set** to save the changes.
- Click **Cancel** to return to the **User Table** window without modifying the user account.

## Restoring the Admin Account Password

If you change the *admin* user account password to something other than *dslam*, then forget the new password, you can restore the *dslam* password as follows:

**1** Delete the pguser.cnf file from the management card.

See “Deleting Files” on page 577 for instructions.

**2** Reset the management card. See “Resetting Cards” on page 589 for instructions.

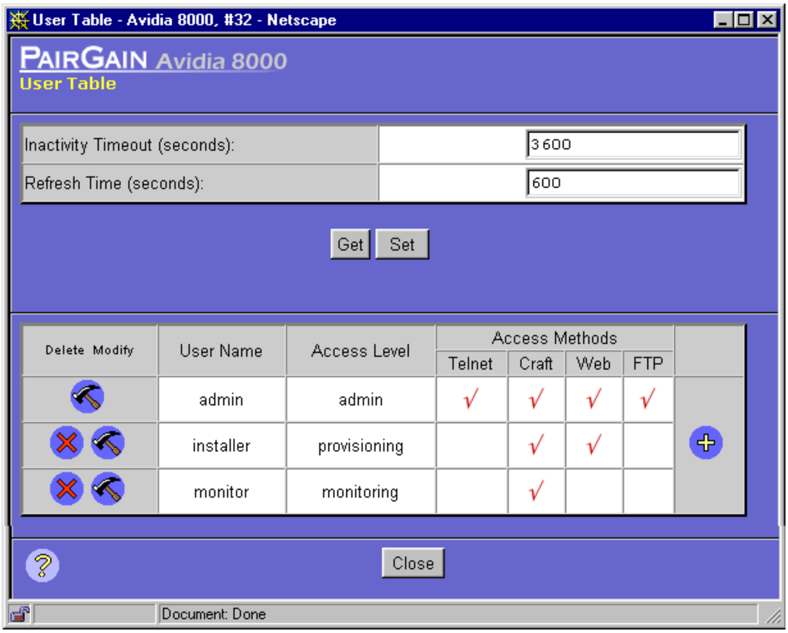
The system automatically regenerates a new configuration file that contains the *admin* user account and default password *dslam*.

# CONFIGURING THE SYSTEM TIMERS

You can specify the length of time after which the Web interface automatically logs the current user off the system if no keyboard input is received. You can also set the frequency with which the data in the performance windows is refreshed.

Do one of the following to display the **User Table** window:

- In the **Site Map Navigation** window, click **User Table**.
- In the **Tree Navigation** window, click **System Maintenance**, **User Table**.




## Setting the Inactivity Timeout

**1** In the **User Table** window, **Inactivity Timeout (seconds)** box, type the number of seconds after which the Web interface automatically logs the current user off the system if no keyboard input is received.

The valid range is 60 to 86,400 seconds.

**2** Do one of the following:

- Click **Set** to activate the new setting.
- Click **Get** to cancel the new setting. You can only cancel the new setting if you have not yet clicked **Set**.

## Setting the Refresh Rate

The Web interface refresh rate determines the interval at which the data on the performance data screens is automatically refreshed. When the management card is rebooted, this setting reverts to the default value of five minutes.

**1** In the **User Table** window **Refresh Time (seconds)** box, type the desired refresh rate in seconds.

The valid range is 5 to 86,400 seconds.

**2** Do one of the following:

- Click **Set** to save the new setting.
- Click **Get** to cancel the new setting. You can only cancel the new setting if you have not yet clicked **Set**.

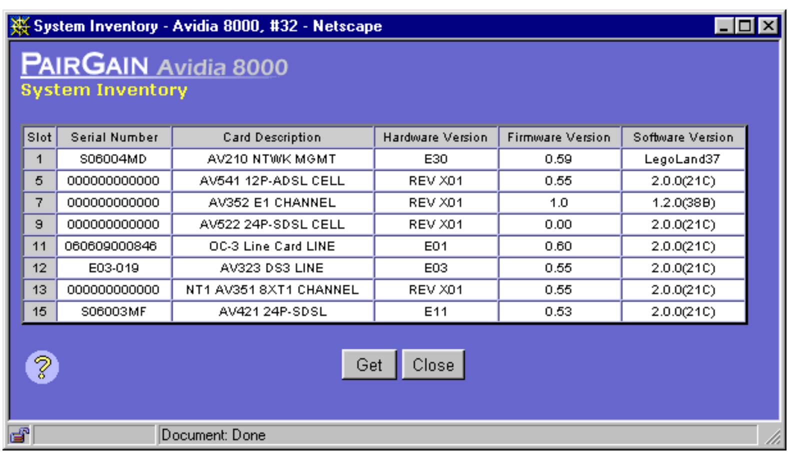
# DISPLAYING SYSTEM INVENTORY

You can display the card description, serial number, hardware version, firmware version and software version for each card installed in the system.

**1** Do one of the following to display the **System Inventory** window:

- In the **Site Map Navigation** window, click **System Inventory**.
- In the **Tree Navigation** window, click **System Maintenance**, **System Inventory**.

**2** If desired, click **Get** to refresh the settings with the most current information.




| Slot | Serial Number | Card Description | Hardware Version | Firmware Version | Software Version |
|---|---|---|---|---|---|
| 1 | S06004MD | AV210 NTWK MGMT | E30 | 0.59 | LegoLand37 |
| 5 | 000000000000 | AV541 12P-ADSL CELL | REV X01 | 0.55 | 2.0.0(21C) |
| 7 | 000000000000 | AV352 E1 CHANNEL | REV X01 | 1.0 | 1.2.0(38B) |
| 9 | 000000000000 | AV522 24P-SDSL CELL | REV X01 | 0.00 | 2.0.0(21C) |
| 11 | 060609000846 | OC-3 Line Card LINE | E01 | 0.60 | 2.0.0(21C) |
| 12 | E03-019 | AV323 DS3 LINE | E03 | 0.55 | 2.0.0(21C) |
| 13 | 000000000000 | NT1 AV351 8XT1 CHANNEL | REV X01 | 0.55 | 2.0.0(21C) |
| 15 | S06003MF | AV421 24P-SDSL | E11 | 0.53 | 2.0.0(21C) |

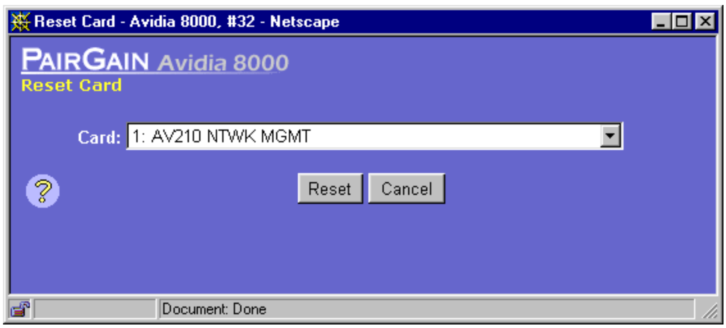
# RESETTING CARDS

You can reboot an individual card, or the entire Avidia system, two different ways:

- Perform a cold boot by recycling power to the system. This reinitializes the card memory, including resetting the system log. If you do not want to lose the data stored in the system log, do not perform a cold boot.
- Perform a warm boot as described in the following sections. The data stored in the system log is retained.

**1** Do one of the following to display the **Reset Card** window:

  - In the **Site Map Navigation** window, click **Reset Card**.
  - In the **Tree Navigation** window, click **System Maintenance**, **Reset Card**.




**2** In the **Card** box, select the card you want to reset. To reset the entire system, reset the cards in the following order:

  **a** Channel cards (ADSL, SDSL, T1)

  **b** Line cards (OC3, DS1, DS3)

  **c** Management card

**3** Do one of the following:

  - Click **Reset** to reset the card, then in the confirmation box click **Back**.
  - Click **Cancel** to close the **Reset Card** window without resetting the card.

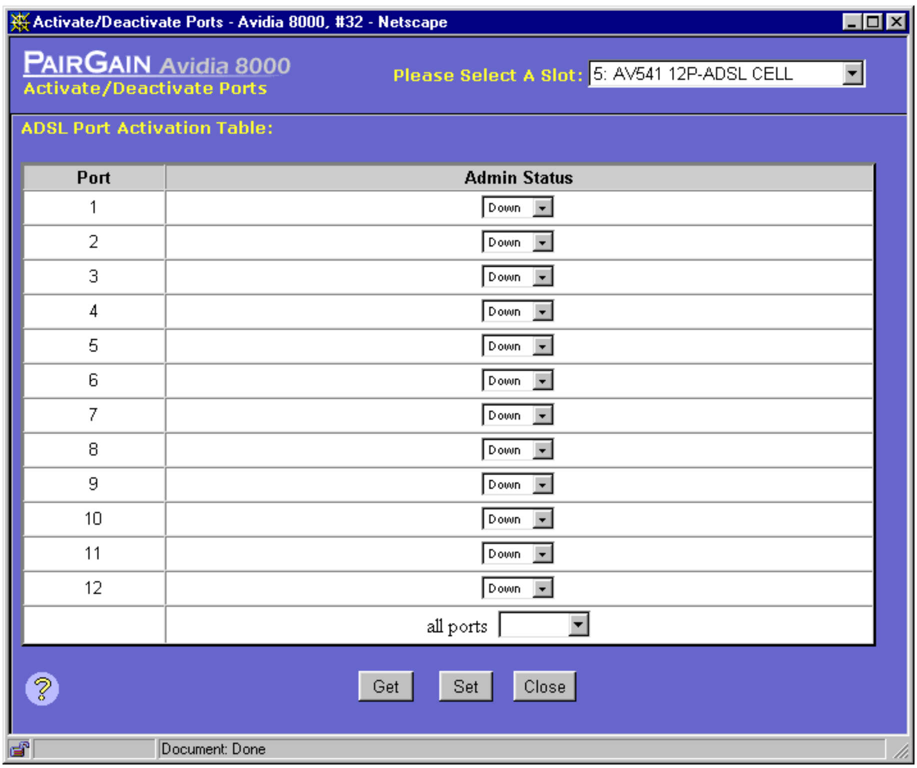
# ACTIVATING AND DEACTIVATING PORTS

**The management card does not issue a trap when you activate and deactivate ports.**

1 Do one of the following to open the **Activate/Deactivate Ports** window:

- In the **Site Map Navigation** window, click **Activate/Deactivate Ports**.
- In the **Tree Navigation** window, click **System Maintenance**, **Activate/Deactivate Ports**.

2 In the **Please Select A Slot** box, select the slot that contains the ports you want to activate or deactivate.



The **Port Activation Table** for the selected slot displays the current **Admin Status** for each port in the selected slot. The following screen shows an example of an **ADSL Port Activation Table**. Similar tables display for other port types.

**3** Do one of the following:

- Change the **Admin Status** for individual ports by selecting **Up** to enable a port or selecting **Down** to disable a port.
- In the **Select All Ports** box, select **UP** to activate all ports on the selected card.
- In the **Select All Ports** box, select **DOWN** to deactivate all ports on the selected card.

**4** Do one of the following:

- To activate the new settings, click **Set**.
- To cancel the new settings, click **Get**. You can only cancel the new settings if you have not yet clicked **Set**.

# PART IV

## APPENDIXES

These appendixes provide additional information about the software.

# TROUBLESHOOTING AND DIAGNOSTICS

A

This Appendix currently contains instructions for ADC technician use only. In future Web interface releases this Appendix will contain instructions for troubleshooting system problems using loopback tests, as well as a comprehensive guide to resolving common system issues.

**The troubleshooting and diagnostic procedures contained in this Appendix require interrupting the system boot sequence by pressing the slash (/) key. Unless you are a ADC technician, do not press the slash key while the system is booting.**

## ACCESSING THE BOOT MONITOR

Each of the procedures contained in this section are performed from the `DMU Test Main Menu`, which you access by booting the system and interrupting the regular boot sequence.

**1** Connect a terminal or PC running a terminal emulation program to the management card craft port.

**2** Reboot the management card by either:

- inserting an item such as the end of a paper clip into the management card reset
- turning the system power off, then back on

See your system Hardware Installation Manual for help locating the management card reset. The system restarts and displays a ten-second counter.

**3** Before the ten-second counter reaches zero, press the forward slash key ( `/` ).

The `DMU Test Main Menu` displays.

```
DMU Test Main Menu:

1 PCI device detect
2 NAND EEPROM/DOSFS
3 TRAM CUBIT
4 IP address config and Image download
5 Start running
6 Display/Set system time

Make a selection >
```

# DOWNLOADING AN IMAGE FILE FROM A TFTP SERVER

If the Avidia system cannot load an image file from the management card, you can download a new image file from a remote TFTP server to the management card using the boot monitor.

**1** From the `DMU Test Main Menu`, type **4** then press **ENTER**.

The `Image Download Options` menu displays.

```
Image Download Options:

C Config only
I Image download (tftp)
B Bulk download (tftp)
X eXit

Make a selection>
```

**2** Do one of the following:

- Type **c** to download a configuration file from a TFTP server.
- Type **i** to download an image from a TFTP server. The system also enables you to download a configuration file, Web interface application file or command-line interface application file during this process.
- Type **b** to download the following files from a TFTP server: image file, configuration file, Web interface application file and command-line interface application file.
- Type **x** to return to the `DMU Test Main Menu`.

Unless you typed **x**, the system prompts you for the IP address of the management card that is installed in the Avidia system. The default IP address displays for your reference.

**3** To accept the displayed default press **ENTER**, otherwise type the management card IP address using the *xxx.xxx.xxx.xx*x format then press **ENTER**.

The system prompts you to enter the subnet mask. The default subnet mask displays for your reference.

**4** To accept the displayed default press **ENTER**, otherwise type the management card subnet mask using the *xxx.xxx.xxx.xx*x format then press **ENTER**.

The system prompts you to enter the default gateway IP address. The default gateway IP address is the IP address of a router on the network through which the system can communicate with external networks. The default gateway default IP address display for your reference.

**5** To accept the displayed default press **ENTER**, otherwise type the default gateway IP address using the *xxx.xxx.xxx.xx*x format then press **ENTER**.

If you are downloading an image file, the system prompts you to enter the boot server IP address. The boot server IP address is the IP address of the TFTP server on which the file you want to download is stored. The default boot server IP address entered displays for your reference.

If you are not downloading an image file, the specified files download and the system displays a message indicating that the download is in progress. When the download is complete, the `DMU Test Main Menu` displays.

**6** If you are downloading an image file:

**a** To accept the default boot server IP address, press **ENTER**, otherwise type the boot server IP address using the *xxx.xxx.xxx.xx*x format then press **ENTER**.

The system prompts you for the boot image file name. The default boot image file name displays for your reference.

**b** To accept the displayed default press **ENTER**, otherwise type the boot file path, file name and extension, then press **ENTER**.

The `Download new config file from network too?` prompt displays.

**c** Type **n**, unless no configuration file exists on the management card (for example, if you are loading the system files onto a newly formatted management card). To download a new configuration file to the management card, type **y**.

**Be sure not to overwrite existing configuration files on the management card.**

The `Download new web interface file from network too?` prompt displays.

**d** Type **y** to down load the Web interface application file, otherwise type **n**.

The `Download new CLI file from network too?` prompt displays.

**e** Type **y** to down load the command-line interface application file, otherwise type **n**.

The specified files download and the system displays a message indicating that the download is in progress. When the download is complete, the `DMU Test Main Menu` displays.

# BOOTING THE SYSTEM

From the `DMU Test Main Menu`:

**1** Type **5** to boot the image file you downloaded in the preceding procedure.

A boot script displays on the screen while the system reboots.

**2** To use the command-line interface, press **ENTER** after the boot script has finished.

# PERFORMING SYSTEM DIAGNOSTICS

The diagnostic tests described in this section can help you determine why the system is not performing properly.

## Detecting PCI Devices

From the `DMU Test Main Menu`, type **1**. The system detects the PCI devices in the system and displays a list on the screen.

## Performing NAND EEPROM Diagnostics

To determine if the system cannot boot the image file due to a defective NAND EEPROM:

**1** From the `DMU Test Main Menu`, type **2**.

The `NAND EEPROM/DOSFS Menu` displays.

```
D             DOSFS Directory
L <file>      Load and run AMC image
R <file>      Read file
T             Test NAND EEPROM (in raw mode)
N             Make file ‘amcprof.txt’ Read-Only
V <file>      Display information on binary image
U             Unformat (DOSFS)
X             eXit to main menu
```

**2** From the `NAND EEPROM/DOSFS Menu` you can do the following:

- Test the read/write functionality of the NAND EEPROM by typing **t** then pressing **ENTER**. The system runs a test and reports the results on the screen.
- View a directory of the files contained in the management card NVRAM by type **d** then pressing **ENTER**. You may want to do this to verify that the image file was successfully downloaded from the boot server.
- Specify a file to boot from the management card by typing **l** `<filename>` then pressing **ENTER**, where `<filename>` is the complete filename and extension of the file you want to load. You may want to do this to load a different image file than the file that is set as the default boot file.
- View the content of any text file by typing **r** `<filename>` then pressing **ENTER**, where `<filename>` is the complete filename and extension of the file you want to view.
- To make the amcprof.txt file on the management card read-only, type **n**. The amcprof.txt file contains the management card hardware and software serial and revision numbers.
- To view binary image file information, such as the version number, processor name and revision number, type **v** `<filename>` where `<filename>` is the complete file name and extension of the binary file for which you want to view information.
- If the EEPROM Test (option **t**) fails, which indicates that the EEPROM has been corrupted, type **u** then press **ENTER** to reformat the EEPROM. The EEPROM is reformatted (restored to its original factory condition).
- Type **x** then press **ENTER** to return to the `DMU Test Main Menu`.

## Testing the TRAM CUBIT

From the `DMU Test Main Menu`, type **3** then press **ENTER**. The system tests the CUBIT, reports the results on the screen, and displays the `DMU Test Main Menu`.

# SETTING THE SYSTEM DATE AND TIME

**1** From the `DMU Test Main Menu`, type **6** then press **ENTER** to display the following prompt:

```
To adjust time/date enter HH:MM:SS or MM-DD-YYYY. X to exit.

FRI MAY 14 12:49:25 1999
```

**2** To change the system time, type the current time in *hh:mm:ss* two-digit 24-hour format, then press **ENTER** (for example 04:30:00).

**3** To change the system date, type the current date in *mm-dd-yyyy* numeric format, then press **ENTER** (for example 05-14-1999).

# CONTACTING ADC B

## TECHNICAL SUPPORT

Technical support is available 24 hours a day, 7 days a week by contacting the ADC Wireline Systems Division Customer Service Engineering Group at one of the following numbers:

- Telephone: 800.638.0031
  714.730.3222
- Fax: 714.832.9924
- Email wsd_support@adc.com

A Customer Service Engineer answers technical assistance calls Monday through Friday between 7:30 AM and 5:30 PM, Pacific Time, excluding holidays. At all other times, an on-duty Customer Service Engineer returns technical assistance calls within 30 minutes.

## WORLD WIDE WEB

Product, company, and application information for ADC can be found at http://www.adc.com using any Web browser.

## LIMITED WARRANTY

ADC DSL Systems, Incorporated ("ADC") warrants that, for a period of twelve (12) months from the date of shipment, the hardware portion of its products will be free of material defects and faulty workmanship under normal use. ADC's obligation, under this warranty, is limited to replacing or repairing, at ADC's option, any such hardware product which is returned during the 12-month warranty period per ADC's instructions and which product is confirmed by ADC not to comply with the foregoing warranty.

ADC warrants that, for a period of 90 days from the date of purchase, the software furnished with its products will operate substantially in accordance with the ADC published specifications and documentation for such software. ADC's entire liability for software that does not comply with the foregoing warranty and is reported to ADC during the 90-day warranty period is, at ADC's option, either (a) return of the price paid or (b) repair or replace of the software. ADC also warrants that, for a period of thirty (30) days from the date of purchase, the media on which software is stored will be free from material defects under normal use. ADC will replace defective media at no charge if it is returned to ADC during the 30-day warranty period along with proof of the date of shipment.

The transportation charges for shipment of returned products to ADC will be prepaid by the Buyer. ADC will pay transportation charges for shipment of replacement products to Buyer, unless no trouble is found (NTF), in which case the Buyer will pay transportation charges.

ADC may use reconditioned parts for such repair or replacement. This warranty ***does not*** apply to any product which has been repaired, worked upon, or altered by persons not authorized by ADC or in ADC's sole judgment has subjected to misuse, accident, fire or other casualty, or operation beyond its design range.

Repaired products have a 90-day warranty, or until the end of the original warranty period—whichever period is greater.

ADC DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND ANY ACCOMPANYING WRITTEN MATERIALS. FURTHER, ADC DOES NOT WARRANT THAT SOFTWARE WILL BE FREE FROM BUGS OR THAT ITS USE WILL BE UNINTERRUPTED OR REGARDING THE USE, OR THE RESULTS OF THE USE, OF THE SOFTWARE IN TERMS OF CORRECTNESS, ACCURACY, RELIABILITY OR OTHERWISE.

# Advance Replacement

Any product determined by ADC not to comply with the applicable warranty within 30 calendar days from the date of shipment to the Buyer, or as otherwise authorized, are eligible for advance replacement free of charge. A replacement product will be shipped to the Buyer within 24 hours of ADC's receipt of notification from the Buyer.

If products returned to ADC for advance replacement are not received by ADC within 30 calendar days of shipment of the replacement product or if no trouble is found (NTF) as determined by ADC, the Buyer will be responsible for payment of the cost of the replacement product.

# BILLING

Equipment returned for repair, replacement, or credit, whether in warranty or out of warranty, which is found to be damaged due to customer negligence or which has had parts removed will be repaired on a time and material basis. ADC will contact the customer for disposition on any equipment that is in this condition or found to be unrepairable.

In the event that the returned equipment is not covered by warranty, ADC will contact the customer with estimated repair or replacement charges and obtain customer disposition of the product if a purchase order has not been provided.

Equipment returned for repair or replacement is subject to a $70 per unit NTF (no trouble found) charge in the event that diagnostic evaluation reveals no evidence of functional failure or physical defects.

# RETURNS

To return equipment to ADC Wireline Systems Division:

1. Locate the number of the purchase order under which the equipment was purchased. You will need to provide this number to ADC Wireline Systems Division Customer Service to obtain a return authorization.
2. Call or write ADC Wireline Systems Division Customer Service to ask for a Return Material Authorization (RMA) number and any additional instructions. Use the telephone number, fax number, or email address listed below:
   - Telephone: 800.370.9670
   - Fax: 714.832.9923
   - Email Address: rma@adc.com

**3** Include the following information, in writing, along with the equipment you are returning:

- Company name, address, telephone number, and the name of a person Customer Service can contact regarding this equipment.
- The purchase order number provided to Customer Service when the RMA number was requested.
- A description of the equipment, as well as the number of units that you are returning. Be sure to include the model and part number of each unit.
- The shipping address to which Customer Service should return the repaired equipment.
- The reason for the return:
  - The equipment needs an ECO/ECN upgrade.
  - The equipment is defective.

**If the equipment is defective, please tell us what you observed just before the equipment malfunctioned. Be as detailed in your description as possible.**

  - If there is another reason for returning the equipment, please let us know so we can determine how best to help you.

**4** Pack the equipment in a shipping carton.

**5** Write the ADC Wireline Systems Division address and the Return Material Authorization Number you received from Customer Service clearly on the outside of the carton and return to:

ADC Wireline Systems Division
14352 Franklin Ave.
Tustin, CA 92780-7013

Attention: **RMA (Number)**

**All shipments are to be returned prepaid. ADC will not accept any collect shipments.**

# SPVC LAST RELEASE CAUSE CODES C

The following table defines the last release cause codes for SPVCs.

| Last Release Cause Value | Definition |
|---|---|
| 0 | invalid cause value - proprietary |
| 1 | unallocated (unassigned) number |
| 2 | no route to transit network |
| 3 | no route to destination |
| 8 | call preempted by higher priority call |
| 10 | UNI 3.0: VPCI/VCI unacceptable |
| 16 | UNI 3.1: normal call clearing |
| 17 | user busy |
| 18 | no user response |
| 19 | no answer from user |
| 21 | call rejected |
| 22 | number changed |
| 23 | user rejects all calls with CLIR |
| 27 | destination out of order |
| 28 | invalid number format |
| 29 | facility rejected |
| 30 | response to STATUS ENQUIRY |
| 31 | normal unspecified |
| 32 | PNNI: too many pending add party requests |
| 34 | PNNI: Requested Called party soft PVPC/PVCC not available |
| 35 | requested VPCI/VCI unavailable |
| 36 | UNI 3.1: VPCI/VCI assignment failure |
| 37 | UNI 3.1: user cell rate unavailable |

| Last Release Cause Value | Definition |
|---|---|
| 38 | network out of order |
| 41 | temporary failure |
| 43 | access info discarded |
| 45 | no VPCI/VCI unavailable |
| 47 | resources unavailable, unspecified |
| 49 | Quality of Service unavailable |
| 50 | requested facility not subscribed |
| 51 | UNI 3.0: user cell rate unavailable |
| 53 | PNNI: call cleared due to change in PGL |
| 54 | Q2931: outgoing Calls Barred with CUG |
| 55 | Q2931: incoming Calls Barred with CUG |
| 57 | bearer capability not authorized |
| 58 | bearer capability not available |
| 62 | inconsistency in designated outgoing access - info subscriber class |
| 63 | service or option unavailable |
| 65 | bearer capability not implemented |
| 73 | unsupported comb. of traffic parameters |
| 78 | UNI 3.1: AAL parameters cannot be supported |
| 81 | invalid call reference |
| 82 | identified channel does not exist |
| 87 | not the member of CUG |
| 88 | incompatible destination |
| 89 | invalid endpoint reference |
| 90 | non-existing CUG |
| 91 | invalid transit network selection |
| 92 | too many add party requests |
| 93 | UNI 3.0:AAL parameters cannot be supported |
| 96 | mandatory info element is missing |
| 97 | message type not implemented |
| 99 | info element not implemented |
| 100 | invalid info element |
| 101 | msg type not compatible with call st |

| Last Release Cause Value | Definition |
|---|---|
| 102 | recovery on timer expiry |
| 104 | incorrect message length |
| 111 | protocol error, unspecified |
| 127 | opt info el content error (non-std) |
| 128 | next node unreachable |
| 160 | DTL Transit not my node ID |

# GLOSSARY D

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|---|---|
| **10BASE T** | The Institute of Electrical and Electronic Engineers (IEEE) 802.3 Ethernet Specification. |
| **ADSL (Asymmetrical Digital Subscriber Line)** | A technology in which data is transferred from the service provider to the subscriber at up to 7.5 Mbps, and transferred from subscriber to service provider at up to 928 kbps. |
| **AIS (Alarm Indicating Signal)** | Indicates an alarm on the line. |
| **AIS-L (Alarm Indicating Signal-Line)** | Indicates an alarm on the SONET line. |
| **AIS-P (Alarm Indicating Signal - Path)** | Indicates an alarm on the SONET path. |
| **ATM (Asynchronous Transfer Mode)** | A high bandwidth, low delay, connection-oriented, packet-like switching and multiplexing technique that uses 53-byte fixed-size cells to transmit voice, video, and data over a network. |
| **Attenuation** | The dissipation of the power of a transmitted signal as it travels over copper wire, measured in decibels (dB). |
| **ATU-C** | An ADSL Transceiver Unit at the service provider end of an xDSL connection. |
| **ATU-R** | An ADSL Transceiver Unit at the remote end of an xDSL connection. |
| **BIP Error (Bipolar Error)** | An error in which two consecutive "one" bits of the same polarity occur on the line. |
| **BER (Bit Error Rate)** | A measure of transmission quality. It is the ratio of error bits to the to the total number of bits transmitted. |
| **BPDU (Bridge Protocol Data Unit)** | A unit of data sent across a bridge. |
| **BPS (Bits Per Second)** | The number of bits transferred during each second of data transmission. |
| **CBR (Constant Bit Rate)** | A traffic class that carries a guaranteed constant bandwidth. It is best suited for applications that require fixed bandwidth, such as uncompressed voice, video, and circuit emulation. CBR is a Quality of Service class defined by the ATM Forum for ATM networks. |

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|---|---|
| **Cell** | A fixed-length packet. Also, the unit of data transmission used in ATM. Each ATM cell contains a fixed-size frame (53 bytes) consisting of a five-byte header and a 48-byte payload. |
| **Channel** | A physical (cable) or virtual path that carries data between two devices. |
| **Circuit** | A communications link between two devices. |
| **CLP (Cell Loss Priority)** | Designates whether an ATM cell can be discarded by the network when there is traffic congestion. This parameter is stored in the ATM cell header. |
| **Community String** | A text string required for an SNMP trap to be received by a trap receiver(s). Also, a text string that identifies an SNMP community and is associated with specific access rights (read-only or read/write). |
| **CRC (Cyclic Redundancy Check)** | A method used to verify the integrity of data transmission. |
| **DLCI (Data Link Connection Identifier)** | The logical channel a data frame travels from the transmitting device to the destination device. The valid range is 16 to 991. |
| **Encapsulation** | The inclusion of data in a protocol header prior to transmission, which enables successful data transmission between different protocol networks. |
| **ES (Errored Second)** | A one-second interval during which errors prevent payload from being corrected. |
| **Ethernet** | A protocol used for LAN traffic, which has a transfer rate of up to 100 Mbps, depending on the media and rating of the interface. |
| **Flash memory** | Non-volatile memory that can be erased and reprogrammed. |
| **Frame relay** | A protocol that divides data into variable-sized frames or packets for transmission over an ATM network to an ATM or frame relay device. |
| **FRF.5** | A Frame relay standard that defines how frames are encapsulated so that they can be carried by the ATM network to another frame device. |
| **FRF.8** | A Frame relay standard that defines how frames are translated between ATM and frame devices. |
| **Gateway** | A device (generally a router) that provides translation services to allow communication between two dissimilar networks. |
| **HDSL (High-bit-rate-Digital Subscriber Line)** | A technology used to transmit data on unconditioned copper telephone wire at rates up to 768 kbps in both upstream and downstream directions, without repeaters. |
| **IDSL (ISDN DSL)** | A technology in which digital data is transferred at rates up to 144 kbps over existing ISDN lines. |
| **IISP (Interim Inter-switch Signaling Protocol)** | Supports static routing of signaling messages between clustered AVIDIA systems. This protocol enables line card redundancy, which automatically reroutes traffic to another static route when a line card fails. |
| **Interworking** | Allows frames to be transported by an ATM network to an ATM device or another frame relay device. |
| **IP (Internet Protocol)** | A TCP/IP protocol that controls packet transmission. |

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| **IP Address** | A 32-bit address used in IP routing. The address consists of four octets separated by decimals. The octets comprise a network section, an optional subnet section, and a host section. |
| **Line** | The link between the Avidia system and the WAN. Also, a SONET interface layer that is responsible for transporting data. |
| **Link** | A PVC endpoint in a frame relay network. |
| **LLSCNAP (Logical Link Control Encapsulation)** | Used in networks in which it is not practical to have a separate virtual channel for each protocol. |
| **LMI (Local Management Interface)** | Defines a method of exchanging status information between the customer device and the network. |
| **LOF (Loss of Frame)** | An error indicating that the receiving equipment has lost a frame. |
| **LOP (Loss of Pointer)** | An error indicating that the receiving equipment has lost a pointer to the start of the cell in the payload. |
| **LOP-P (Loss of Pointer - Path)** | Indicates that a loss of pointer error has occurred in the SONET Path layer. |
| **LOS (Loss of Signal)** | An error indicating that the receiving equipment has lost the signal. |
| **MAC Address** | The hardware address of a device connected to a network. |
| **Margin** | The noise margin in decibels that the modem must achieve with a BER of 10 to the -7 or better to successfully complete initialization. |
| **Matching length** | The number of ATM Destination Address Prefix octets you want the system to consider when determining whether the IISP Static Route Table entry matches a particular SPVC.<br>For example, if you select 2, then all SPVCs for which the first two octets of the destination ATM address prefix match the first two octets of the IISP Static Route Table entry will be routed according to the information in that table entry. |
| **MBS (Maximum burst size)** | The maximum number of cells that can be transmitted at the peak cell rate. |
| **Medium** | A SONET layer that converts electrical signals to optical signals. |
| **MIB (Management Information Base)** | A set of variables that define the configuration and status parameters for network management. Network management stations can retrieve information from and write information to a MIB. The Internet Engineering Task Force (IETF) specifies standard MIBs for certain types of devices, ensuring any NMS can manage the devices. Vendors can specify proprietary MIBs for their devices to fit specific needs. |
| **nrt-VBR (non-real-time Variable Bit Rate)** | A traffic class that carries variable bandwidth. It is well suited for data services such as frame relay over ATM which requires guaranteed bandwidth and lower Quality of Service. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size. |
| **NVRAM (Non-volatile Random Access Memory)** | A medium for storing system configuration information, so the information is not lost when the system is reset. |
| **Octet** | A TCP/IP term that means eight bits. |

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| **Path** | A SONET layer that handles transport of services. |
| **PCR (Peak Cell Rate)** | The maximum rate at which data is transferred on the line, measured in cells per second. |
| **Ping** | A program used to test the communication link between two computers on a network. |
| **QoS (Quality of Service)** | The configured traffic parameters that are assigned to a virtual circuit, which specifies how quickly and how accurately data is transferred from the sender to the receiver. |
| **RDI (Remote Defect Indicator)** | Indicates that there is an error on the far end of the line. |
| **RDI-L (Remote Defect Indicator - Line)** | Indicates that there is a SONET Line error at the far end of the line. |
| **RDI-P (Remote Defect Indicator - Path)** | Indicates that there is a SONET Path error at the far end of the line. |
| **Retry interval** | The number of seconds the system waits before reattempting to establish the SPVC after a failed call attempt. The range is 0 to 3600. |
| **Retry limit** | The maximum number of allowable unsuccessful call setup attempts. The range is 0 to 65535. A value of 0 indicates no limit. |
| **RIP (Routing Information Protocol)** | A protocol for managing routing information within a LAN or a group of LANs. |
| **rt-VBR (real-time Variable Bit Rate)** | A traffic class that carries a variable bandwidth. It is well suited for real-time services such as compressed voice and video which require stringent cell transfer latency and less bursty traffic. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size. |
| **SCR (Sustainable Cell Rate)** | The average rate at which ATM cells are transferred, measured in cells per second. |
| **SDSL (Symmetric Digital Subscriber Line) Frame** | A technology in which data is transferred at 1.544 Mbps each direction. |
| **SDSL (Symmetric Digital Subscriber Line) Cell** | A technology in which ATM cells are transferred between the service provider and the subscriber at up to 2048 kbps. |
| **Section** | A SONET layer that handles framing, scrambling, and error monitoring. |
| **SEF (Severely Errored Frame)** | Detected when the incoming signal has a minimum of four consecutive errored framing patterns. |
| **SES (Severely Errored Framing Seconds)** | Seconds during which more than 2,500 bipolar errors are detected on the line. |
| **SNMP (Simple Network Management Protocol)** | A protocol that specifies how to send information between a Network Management System (NMS) and managed devices on a network. The managed devices run a program called an agent. The agent interprets SNMP requests and responds to them. |
| **SONET (Synchronous Optical NETwork)** | An ANSI standard for transmitting information over optical fiber. This standard is used in the United States and Canada. |

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|---|---|
| **Subnet Mask** | A type of IP address that allows a site to use a single IP address for multiple physical networks. |
| **TCP (Transmission Control Protocol)** | A connection-oriented protocol in which datagrams are divided when sent and reassembled when received. This allows the different components of the message to be routed differently to increase the speed of transmission. |
| **Telnet** | An internet standard protocol that allows a user to log onto one system from another system and perform tasks just as if he were logged on locally. |
| **TFTP (Trivial File Transfer Protocol)** | A file transfer protocol that is often used to boot network devices over a network. |
| **Traps** | SNMP messages sent to alert network managers about network events. |
| **Trap receivers** | PCs configured to received SNMP traps. |
| **UAS (Unavailable Seconds)** | Seconds during which the line is unavailable. |
| **UBR (Unspecified Bit Rate)** | A best-effort class of traffic, best suited for LAN. When network congestion occurs, the data is stored in a buffer until it can be sent. |
| **UDP (User Datagram Protocol)** | A protocol in which datagrams are sent whole and in the correct order. They cannot be divided when sent and then reassembled when received. |
| **UPC (Usage Parameter Controls)** | Service categories used to establish Quality of Service for an ATM connection. |
| **VBR (Variable Bit Rate)** | A traffic class that carries variable bandwidth. It is best suited for applications such as compressed voice and video. It uses peak cell rate, sustained cell rate, and maximum burst size for configuration. It is not well suited for LAN traffic due to the unpredictability of LAN traffic burst size. |
| **VC or VCC (Virtual Circuit or Virtual Circuit Connection)** | A logical connection in the ATM network over which ATM cells are transmitted. |
| **VCC (Virtual Channel Connection)** | A logical connection in the ATM network over which ATM cells are transmitted. |
| **VCMUX (Virtual Circuit-based encapsulation)** | Used in networks with a large number of virtual channel, so that it's practical to carry a single protocol per virtual channel. |
| **VP or VPC (Virtual Path or Virtual Path Connection)** | A group of virtual circuits bundled together and carried between two devices. |
| **VP or VPC (Virtual Path or Virtual Path Connection)** | A group of virtual circuits bundled together and carried between two devices. |

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