

35 Managing ATM Access Modules

ATM access, or uplink, ports allow switch traffic to connect to a native ATM network. In typical configurations, LAN traffic from Ethernet or Token Ring devices is translated and switched out an ATM access port to an ATM-based network. (An ATM-based network is comprised of pure ATM switches, such as OmniSwitches with Cell Switching Modules (CSMs) installed.)

You can configure several services on these ATM access ports to facilitate communication between the access port and an ATM switched port. These services include LAN Emulation, Classical IP, and Point-to-Point bridging. The configuration of these services is described in Chapter 38, “Configuring ATM Services.”

ATM access modules include all ASM modules, ATM circuit emulation modules (ASM-CE), and FCSM modules on the OmniSwitch and all ASX modules on the Omni Switch/Router. ATM access modules provide OC-3, OC-12, DS3, and E3 User-to-Network (UNI) connections that typically attach to an ATM switch. An ATM switch, such as an OmniSwitch with Cell Switching Modules (CSMs), also supports UNI connections, but can also support Private Network-to-Network Interface (PNNI) and Interim Interswitch Signalling Protocol (IISP) connections.

This chapter provides overview information and configuration instructions for ATM access ports. It focuses on the ATM layer configuration parameters, specifically for OC-3 and OC-12 ATM access ports. The OmniSwitch also supports ATM DS-3 and E3 access ports. However the configuration of ATM DS-3 and E3 access ports is covered in more detail Chapter 54, “Managing DS3/E3 Modules.” The following are OmniSwitch modules containing ATM access ports:

ATM DS3/E3 Ports. ATM DS3 and E3 modules require different port configuration procedures than the directions in this chapter. These ports have a separate menu for physical-level parameters. This menu is described in Chapter 54, “Managing DS3/E3 Modules.”

Circuit Emulation Modules. Only the ATM uplink port on a circuit emulation module is an ATM access port. Instructions for configuring that port are in this chapter. Instructions for configuring other ports on the ASM-CE can be found in Chapter 36, “Managing Circuit Emulation Modules.”

FCSM Access ports. See *FCSM ATM Access Ports* on page 35-4.

CSM Ports. CSM ports support pure ATM switching traffic. These ports connect ATM switches together and can connect to ATM access ports, such as those on ATM access modules. CSM ports are described in Chapters 41 through 47.

Two Generations of Modules

In Release 3.0 a second generation of ATM access modules was released that uses an advanced Segmentation and Reassembly (SAR) ASIC known as “SAHI.” These modules have many improvements of the first generation of ASM modules, including larger transmit and receive buffers and traffic shaping. All of these modules are described in the tables below.

Early Generation OmniSwitch ATM Access Modules

Module	Port Number/Type	Speed Supported (per port)	Traffic Shaping Supported?
ASM-155F	1 or 2 SC	155 Mbps	No
ASM-155C	1 or 2 RJ-45	155 Mbps	No
ASM-DS3	1 or 2 BNC	44.736 Mbps	No
ASM-E3	1 or 2 BNC	34.368 Mbps	No
ASM-CE-155F	5 total: 1 SC 2 T1 or E1 2 serial	SC: 155 Mbps T1: 1.544 Mbps E1: 2.048 Mbps Serial: 56 - 2048 Kbps	No
ASM-CE-DS3	5 total: 1 DS3 2 T1 or E1 2 serial	DS3: 44.736 Mbps T1: 1.544 Mbps E1: 2.048 Mbps Serial: 56 - 2048 Kbps	No
ASM-CE-E3	5 total: 1 E3 2 T1 or E1 2 serial	E3: 34.368 Mbps T1: 1.544 Mbps E1: 2.048 Mbps Serial: 56 - 2048 Kbps	No
FCSM I	2 logical (not physical) ports	155 Mbps	No

SAHI-Based ATM Access Modules

Module (Chassis)	Port Number/Type	Speed Supported (per port)	Traffic Shaping Supported?
ASM2-155F (OmniSwitch)	1 or 2 SC	155 Mbps	Yes
ASM2-155RF (OmniSwitch)	1 or 2 SC port pairs (each port pair acts as one port)	155 Mbps	Yes
ASM2-622F (OmniSwitch)	1 or 2 SC	622 Mbps	Yes
ASM2-622RF (OmniSwitch)	1 or 2 SC port pairs (each port pair acts as one port)	622 Mbps	Yes
ASM2-DS3 (OmniSwitch)	1 or 2 BNC	44.736 Mbps	Yes
ASM2-E3 (OmniSwitch)	1 or 2 BNC	34.368 Mbps	Yes
FCSM II (OmniSwitch)	1 logical (not physical) port	622 Mbps	Yes
ASX-155FM/FS/FSH (Omni Switch/Router)	1 or 2 SC	155 Mbps	Yes
ASX-155RFM/RFS-1W (Omni Switch/Router)	1 SC port pair (the port pair acts as one port)	155 Mbps	Yes
ASX-DS3 (Omni Switch/Router)	1 or 2 BNC	44.736 Mbps	Yes
ASX-E3 (Omni Switch/Router)	1 or 2 BNC	34.368 Mbps	Yes
ASX-622RFM/RFS-1W (Omni Switch/Router)	1 SC port pair (the port pair acts as one port)	622 Mbps	Yes

FCSM ATM Access Ports

Although the FCSM does not contain any physical ports, it does contain an internal ATM access port that can be viewed and configured through switch software. This port is functionally the same as an ASM module port. However, instead of connecting to an ATM switch through cable, this logical port is hardwired into the ATM cell matrix.

You can view statistics and configure ATM services, such as LAN Emulation and Classical IP, on this internal port. By creating ATM services on this port, you provide a bridge between devices on LAN interfaces (Ethernet, Token Ring) and those connected to the native ATM network. This FCSM logical port would display as port 1 for the slot in which the FCSM port is installed. For example, if the FCSM is installed in slot 3, then this uplink port would display as port **3/1**.

This internal ATM access port is directly connected to an OC-3c/STM-1 (FCSM I) or OC-12c/STM-4c (FCSM II) port that is functionally the same as a CSM port. Logically, these two ports are two halves of the same port; User Interface software displays them as part of the same port.

In some command displays you may also note that there is a *second* FCSM port on the FCSM I. (The FCSM II has only one internal port.) If the FCSM I were installed in slot 3, this second port would display as port **3/2**. This second internal port also contains an ATM access half and a CSM half. It is used to pass control signals. Unlike the first FCSM port, this second port is only partially configurable (i.e., SAR and frame buffer sizes only). If you increase default buffer sizes on this second port you may place limitations on your ATM configuration.

The following table summarizes the functions of each FCSM port:

FCSM Ports

	Port 1 (FCSM I)	Port 1 (FCSM II)	Port 2 (FCSM I)
ASM half	ATM Services Port	ATM Services Port and Management Data (ILMI, UNI signaling, PNNI)	Management Data (ILMI, UNI signaling, PNNI)
CSM half	Connects ATM Service Port to Cell Matrix	Connects ATM Service Port to Cell Matrix and Management Data (ILMI, UNI signaling, PNNI)	Management Data (ILMI, UNI signaling, PNNI)

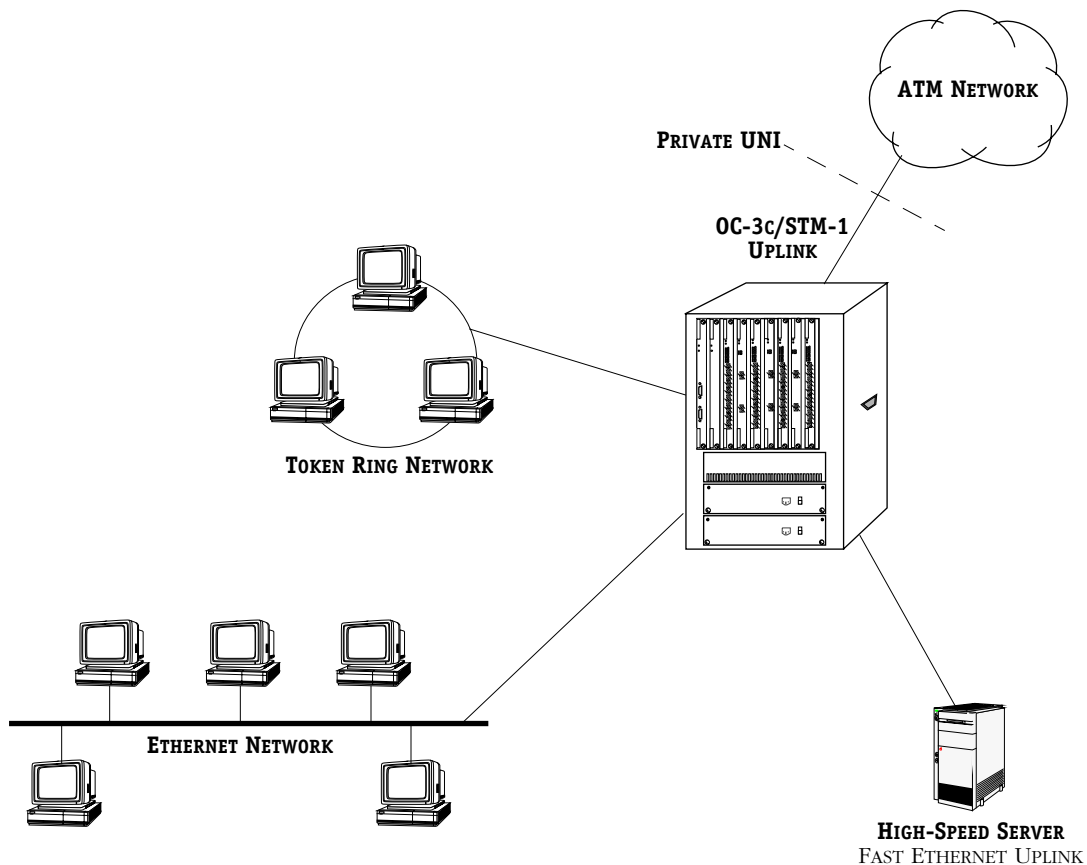
LAN Switch with ATM Uplinks

The OmniSwitch can switch frames from LAN interfaces such as Ethernet and Token Ring to an ATM-based network. It supports ATM uplink connections that are compatible with User-to-Network (UNI) versions 3.1 and 3.0 to provide comprehensive LAN-to-ATM internetworking. These ATM uplink connections provide connectivity to a native ATM network.

Typically you will configure services on ATM access ports in order to bridge LAN traffic (Ethernet and Token Ring) onto the ATM network. LAN traffic enters the OmniSwitch through an Ethernet or Token Ring port and exits through an ATM access port. It is on such an access port that you configure one of several ATM services.

These services include LAN Emulation (LANE), Point-to-Point Bridging (PTOP), Classical IP, Trunking, and VLAN clusters. ATM services may be configured through the **cas** command or, in the case of LANE, they can be brought up on-the-fly through auto-activation. The **cas** command and all ATM service types are described in detail in Chapter 38, "Configuring ATM Services." Auto-activated LANE services are described in Chapter 37, "LANE Server Configuration."

The network in the illustration below shows an OmniSwitch switching traffic for Ethernet, Token Ring, Fast Ethernet, and ATM uplink interfaces. It serves as a LAN switch while having an OC-3 uplink to the ATM network.



OmniSwitch as a LAN-to-ATM Internetworking Device

The ATM Menu

User Interface commands for configuring and monitoring ATM access ports are in the ATM menu. The ATM menu displays as shown below. To view the ATM Menu, type **atm** at any prompt.

Command	ATM Management Menu
vap	View the list of ATM ports configurations
map	Modify an ATM port configuration
vvc	View virtual channel connections
cvc	Create a virtual channel connection
mvc	Modify a virtual channel connection
dvc	Delete a virtual channel connection
vva	View virtual atm addresses
cva	Create a virtual atm address
mva	Modify a virtual atm address
dva	Delete a virtual atm address
vlat	View ATM LANE LE_ARP table
vat	View ATM CIP Arp Table
aat	Add static ATM Arp entry for CIP
dat	Delete static ATM Arp entry for CIP
vss	View ATM Service statistics
vls	View atm layer statistics table
vlsr	View atm layer rx error statistics table
vlts	View atm layer tx error statistics table
vcs	View atm connection statistics table
vcrs	View atm connection rx error statistics table
vcts	View atm connection tx error statistics table
vbwg	View the bandwidth group table
mbwg	Modify the bandwidth group table
vgptovc	View group to VC mapping table (Scaling)
Main	File
Interface	Security
	Summary
	VLAN
	Services
	Networking
	Help

This menu contains commands that can be used with ATM uplink modules, Frame-to-Cell Switching modules (FCSM modules), and Cell Switching Modules (CSM modules). The commands in the menu operate differently for ATM access modules, FCSM modules, and CSM modules.

This chapter describes ATM menu commands as they apply to ATM access ports. The commands are different when used with CSM modules. See Chapter 42, “Managing Cell Switching Modules (CSMs),” for information on how these commands apply to CSM modules.

Several commands apply to the ATM service commands that can be set up on ATM access ports. These commands include those for Classical IP (**vat**, **aat**, **dat**), LAN Emulation (**vlat**), 1483 scaling (**vgptovc**), and the **vss** command. These commands are described in Chapter 38, “Configuring ATM Services.”

Modifying an ATM Access Port Configuration

Use the **map** command to alter ATM access port configuration settings. Ports are configured with default settings until you modify them using the **map** command. To use this command, enter **map** followed by the slot and port number of the ATM access port you want to modify. For example, to change settings for port 1 on the module in slot 5, you would enter:

```
map 5/1
```

A screen similar to the following displays:

Slot 5 Port 1 Configuration

1) Description (30 chars max)	: ATM PORT
2) Conn Type { PVC(1), SVC(2)}	: SVC
30) Sig version { 3.0(1) 3.1(2) }	: 3.0
31) Signaling VCI (0..1023)	: 5
32) ILMI Enable {(False(1),True(2))}	: True
33) ESI (12 hex-chars)	: 0020da79efbf
34) ILMI VCI (0..1023)	: 16
35) ILMI Polling {(Off(1),On(2))}	: Off
3) Max VCCs (1-1023)	: 1023
4) Max VCI bits (1..10)	: 10
5) UNI Type	: Private
6) Tx SAR Buffer Size (4096-131072)	: 16384
7) Rx SAR Buffer Size (4096-131072)	: 16384
8) Tx Frame Buffer Size (1800-16384)	: 4600
9) Rx Frame Buffer Size (1800-16384)	: 4600
10) PI Scramble {(False(1),True(2))}	: True
11) Timing Mode {(Loop(1),Local(2))}	: Local
12) Loopback Config { NoLoop(1), DiagLoop(2), LineLoop(3) }	: NoLoop
13) Phy media { SONET(1),SDH(2)}	: SONET

Enter (option=value/save/cancel) : cancel

You change a value in the field by entering the line number for the value, an equal sign (=), and then the new value for the variable. For example, to change the **Description** field variable to read "Switch Uplink Port," you would enter a 1 (the line number for **Description**), an equal sign, and then the new description as follows:

```
1=Switch Uplink Port
```

The variables in the **map** command screen are explained in the following sections.

1) Description

A textual description of this ATM access port. The description may be up to 30 characters long. This identifier will be used in displays for other software commands.

2) Conn Type

Indicates whether connections established on this port will be Permanent Virtual Circuits (PVCs) or Switched Virtual Circuits (SVCs). You create PVCs through the **cvc** command, which is described in *Creating a Virtual Channel Connection* on page 35-12. PVC information is stored in flash memory on the MPM module; if you restart the switch, the PVC would be restored.

Switched Virtual Circuits, or SVCs, are learned by the OmniSwitch through communication with the ATM attached devices. SVCs are built up and taken down based on demands for virtual connections by ATM end devices. If an SVC connection is lost or the switch is restarted, then the circuit is lost and the source device must request the connection again.

The type of connection you choose can affect the type of ATM services you can set up on a port. For example, LANE requires SVC connections, and VLAN clusters requires PVC connections.

Enter a **1** to select PVC, or enter a **2** to select an SVC.

SVC Configuration Options. If you select SVC, you will see an additional menu of options. The items in this menu are described as follows:

30) Sig Version

The version of the User-to-Network Interface (UNI) used on this port. The OmniSwitch is compliant with ATM Forum UNI specifications versions 3.0 and 3.1. You select which version your ATM network supports. (The signalling version you are using must match the signalling version being used on the network.)

♦ Important Note ♦

If you change the **Signaling Ver** from UNI 3.0 to UNI 3.1 (or vice versa), then you *must* reboot the switch.

31) Signalling VCI

The Virtual Channel Identifier (VCI) used for signaling. For ATM access ports, this VCI is typically set to 5.

32) ILMI Enable

Indicates whether you want to enable Integrated Local Management Interface (ILMI). Normally ILMI should be enabled. The only reasons not to enable ILMI are if the ATM network switch does not support ILMI or if the ATM network switch is unable to register the network prefix with the OmniSwitch in a timely manner. The disadvantage of disabling ILMI is that the ATM network switch needs to have a static route configuration to map the ATM address of the OmniSwitch port to its port configuration. In this case, you will need to enter the full ATM address instead of just the End Station Identifier (ESI).

33) ESI

The 6-byte End Station Identifier (ESI) for this port. This value, which functions like a MAC address for this port, is used by the ATM switch to identify this particular ATM access port.

In software releases prior to 4.1, the ESI assigned to each ATM access port used the base MAC address for the module and the slot/port number (e.g., 2/1). This method created a problem if the ATM access module moved between different slots since the ESIs changed because the physical port number changed.

In release 4.1 and later, the method for assigning an ESI has changed. The base MAC address is still used, but the interface number is used instead of the slot/port number. If an ATM access module is moved between different slots, the interface number remains the same and thus the ESI is maintained.

With this change, there could be some backward compatibility problems when upgrading to Release 4.1 and later since the ESI of the ATM access ports will change. Fortunately, this change will only affect SVC-based PTOP and trunking services since the remote station stores the old ESI in its system. PVC-based services are not affected.

34) ILMI VCI

The Virtual Channel Identifier (VCI) that will be reserved for ILMI management signaling on this port. For ATM access ports, this VCI is typically set to 16.

35) ILMI Polling

The ILMI status messages sent out at regular intervals (about every 3-5 seconds) from this port. If you want to enable ILMI polling, select the **On** option. If you want to disable ILMI polling, select the **Off** option. The default value for **ILMI Polling** is **Off**.

3) Max VCCs

The maximum number of Virtual Channel Connections (VCCs) allowed on this port. This parameter is not configurable and will always read **1023**. Each port can support up to 1023 virtual connections. You configure these VCCs through the **cvc** command.

4) Max VCI Bits

The maximum number of bits that can be used for Virtual Channel Identifiers (VCIs) created on this port. This parameter is not configurable and will always read **10**. ATM access ports support up to 10 bits per Virtual Path. The maximum number of Virtual Channels is $2^n - 1$ where n is the maximum VCI bits.

5) UNI Type

Specifies the type of User-to-Network Interface (UNI) that this port supports. ATM supports both Private and Public UNI connections, but typically Private is used for ATM uplink, or access, connections to an ATM switch. Only **Private** is supported on this port.

6) Tx SAR Buffer Size and 7) Rx SAR Buffer Size

The size of the segmentation cell buffer (**Tx SAR Buffer Size**) and the reassembly cell buffer (**Rx SAR Buffer Size**) on this UNI. These buffers comprise the entire Segmentation and Reassembly (SAR) buffer for this ATM access port.

◆ Important Note ◆

You *cannot* configure these fields on an Omni Switch/Router ATM access module or on an OmniSwitch ASM2 module.

On OmniSwitch ASM modules, sizes can range from 4,096 to 131,072 bytes. On OmniSwitch ASM2 and Omni Switch/Router ATM access modules, the size is fixed at 131,072 bytes (128 K).

SAR buffers are located in memory on the ATM board. On ASM modules, this memory can be factory-configured to either 512K or 2MB. On 512K boards, SAR buffer sizes are by default set to 8K. On 2MB boards, SAR buffer sizes are by default set to 16K. If you swap a 512k board for a 2 MB board, then you may need to reconfigure these buffer sizes. In addition, if the board swap changes the port type (e.g., single mode to multimode, OC-3 to DS-3) or the SAR type (e.g., ASM to an ASM2 module), then the switch will automatically detect the change and reset the segment size to the default for the new board.

A SAR buffer size of 8K should be sufficient for Ethernet-only connections. Connections to interfaces that use larger packets, such as FDDI and LAN Emulation services, require SAR buffer sizes of at least 16K and probably 32K for best performance.

The number of virtual circuits required should also be considered when choosing the SAR buffer size. The number of virtual connections possible depends on two conditions:

- a. The size of available SRAM (512K or 2 MB). The more memory available, the more connections can be supported.
- b. The size of the Segmentation and Reassembly (SAR) cell buffer (i.e, the value indicated in this field). As the SAR buffer size increases, the number of virtual circuits that can be supported decreases.

◆ Important Note ◆

If you change a SAR buffer size, you need to reboot the switch for the change to take effect

8) Tx Frame Buffer Size

The size of the transmit frame buffer, or the maximum size of packets that can be transmitted from ATM to the switch backplane. This value can range from 1800 to 131,072 bytes, but must be less than or equal to the **Tx SAR Buffer Size**. This value should be greater than or equal to the **Tx Maximum Frame Size** (set through the **cvc** command) of all connections on this port.

9) Rx Frame Buffer Size

The size of the receive frame buffer on this UNI, or the maximum size of packets that can be received from the switch backplane. This value can range from 1800 to 131,072 bytes, but must be less than or equal to the **Rx SAR Buffer Size** and should be greater than or equal to the **Rx Maximum Frame Size** (set through the **cvc** command) of all connections on this port.

10) Pl Scramble

Payload scramble. This option determines whether chip hardware on the module will perform cell scrambling/descrambling, which randomizes cell payloads. Payload scrambling helps avoid continuous non-variable bit patterns and improves cell delineation. Cell delineation is the process used to determine cell boundaries by finding the Header Error Control (HEC) in cell headers. By default, payload scrambling is enabled as required by UNI specifications.

11) Timing Mode

This parameter allows you to specify which clock the switch will use for this port. The choices are **Local** and **Loop**. Local is the transmit, or internal, clock. The local clock is generated by this switch; this is the default setting for ATM access ports. Loop is the receive, or external, clock. In a loop configuration, this port derives clocking from a remote device, such as an ATM switch or another Alcatel ATM access port.

Your choice of timing mode may be determined by the device to which this port is connected. Some ATM switches require uplink ports to generate their own clock. Other ATM switches require uplink ports to use their clock.

◆ **Note** ◆

If you set an ATM access port to **loop** and you are connecting it to another ATM uplink, or access, port (i.e., not a pure ATM switch port), then that other port must be on an Alcatel switch.

12) Loopback Config

The loopback configuration for this port. In live network situations, use the **NoLoop** option, which is the default. The other two loopback configurations, **DiagLoop** and **LineLoop**, are intended mainly for debugging or test situations. The following provides more detail on the three loopback configurations:

- NoLoop** No loopback occurs between receive and transmission paths.
- DiagLoop** Interface transmission path is connected to receive path at the connectors. The port receives its own transmission rather than the signal coming over the cable.
- LineLoop** The interface receive path is looped to the transmission path at the connectors. The signal on the receive connector is not passed into the UNI and processed.

13) Phy media

The type of physical media standard used for this port. In North America, ATM broadband services are delivered over Synchronous Optical Network (SONET) facilities. SONET is a high-speed fiber optic system that uses Synchronous Transfer Signal Level 1 (STS-1).

Outside North America, ATM broadband services use Synchronous Digital Hierarchy (SDH). SDH is a high-speed fiber optic system that uses Synchronous Transfer Mode (STM-1). The OmniSwitch supports both SONET and SDH fiber systems. You select the system with which you want this port to be compatible.

Creating a Virtual Channel Connection

The **cvc** command allows you to create a Permanent Virtual Circuit (PVC) for a physical port and logical VCI that you specify. These PVCs are used mainly by ATM services, which are described in Chapter 38. The commands for setting up ATM services (**cas** and **mas**) also create these PVCs, so use of the **cvc** command before configuring ATM services is not required.

To begin setting up a permanent virtual circuit, enter **cvc** followed by the slot number, a slash (/), and the port number where you want to set up the virtual circuit. After the slot and port number, leave a space, then specify the Virtual Channel Identifier (VCI). For example, the following command specifies a virtual circuit with a VCI of 100 on the first port on the module in slot 5:

```
cvc 5/1 100
```

The initial message will be followed by a screen of options similar to the following:

Slot 5 Port 1 Connection VCI 100 Configuration

Available bandwidth: Tx=353208 Rx=353208

- | | |
|--|------------------|
| 1) Description (30 chars max) | : Connection 200 |
| 2) Requested Tx QoS Class { Unspecified(0) } | : Unspecified |
| 3) Requested TX Best Effort { False (1), True (2) } | : True |
| 4) Requested Tx Traffic Descriptor { NoCLPNoSCR(2) } | : NoCLP NoSCR |
| 20) Peak Cell Rate (cells/sec) for CLP=0+1 | : 353208 |
| 5) Requested Rx QoS Class { Unspecified(0) } | : Unspecified |
| 6) Requested RX Best Effort { False (1), True (2) } | : True |
| 7) Requested Rx Traffic Descriptor { NoCLPNoSCR(2) } | : NoCLP NoSCR |
| 30) Peak Cell Rate (cells/sec) for CLP=0+1 | : 353208 |

More y/n? (y) :

This portion of the **cvc** screen shows “requested” parameters. These are the values for parameters that you would ideally like to meet on this virtual circuit. These values, such as the Peak Cell Rate (PCR), may not always be possible to meet depending upon traffic patterns. Therefore, you can also specify “acceptable” values for each of these parameters. You will see the acceptable parameters after you enter press **<Enter>** at the **More y/n?** prompt.

- | | |
|--|---------------|
| 8) Acceptable Tx QoS Class { Unspecified(0) } | : Unspecified |
| 9) Acceptable TX Best Effort { False (1), True (2) } | : True |
| 10) Acceptable Tx Traffic Descriptor { NoCLPNoSCR(2) } | : NoCLP NoSCR |
| 40) Peak Cell Rate (cells/sec) for CLP=0+1 | : 12200 |
| 11) Acceptable Rx QoS Class { Unspecified(0) } | : Unspecified |
| 12) Acceptable RX Best Effort { False (1), True (2) } | : True |
| 13) Acceptable Rx Traffic Descriptor { NoCLPNoSCR(2) } | : NoCLP NoSCR |
| 50) Peak Cell Rate (cells/sec) for CLP=0+1 | : 12200 |
| 14) Tx Maximum Frame Size | : 4520 |
| 15) Rx Maximum Frame Size | : 4520 |

Enter (option=value/save/cancel) :

The values you enter for the fields on the bottom half of the **cvc** screen represent what you consider acceptable. The hardware will make its best attempt to meet your requested parameters first. If it can not meet these requirements, it will attempt to meet your acceptable requirements. If it also cannot meet your acceptable requirements, then the VCC will not be operational. However, if you do not enter acceptable values, then the hardware will send traffic at the best possible rate below your requested rate.

For example, if you enter a requested Tx (transmit) Peak Cell Rate (PCR) of 150000 cells/second, then the ATM access port will make its best attempt to meet this rate. If the module cannot support that rate, then software will find the best possible rate below 150000 cells/second. If you did not enter any acceptable parameters, then the software might, as an example, find that traffic could be sent at 75000 cells/second on this VCC, and traffic would be transmitted at this rate. However, if you had entered an *acceptable* PCR of 100000 cells/second, the software would find that it could not meet this requirement and the VCC would not be operational.

1) Description: (30 chars max)

A textual description for this virtual circuit. The description may be up to 30 characters long. This description will be used in displays for other software commands to identify this virtual circuit.

2) Requested Tx QoS Class

The Quality of Service (QoS) for cells transmitted (from source to destination) on this virtual circuit. For ATM uplink connections to an ATM switch only the **Unspecified** QoS is supported. This QoS transmits data on a best effort basis; bandwidth is not guaranteed, but as much data as possible will be transmitted as long as bandwidth is available.

3) Requested Tx Best Effort

This field indicates whether you want this port to transmit traffic on a “best effort” basis or to use a Peak Cell Rate (PCR) parameter to transmit traffic. If you select True (option 2), then the port will transmit traffic if any bandwidth is available on the port. If you select False (option 1), then the Peak Cell Rate (PCR) parameter will be used to transmit traffic on this VCC. You enter a PCR value in line 20 of this screen. If data cannot be sent at the PCR you specify, then no data will be sent on the VCC.

4) Requested Tx Traffic Descriptor

The traffic descriptor to be used. The traffic descriptor determines which traffic parameters you specify. Only the **NoCLPNoSCR** traffic descriptor is supported. **NoCLPNoSCR** requires you to enter the Peak Cell Rate (PCR) on line 20. However, if you select **True** on line 3 (**Requested Tx Best Effort**), then the PCR will not be used to determine traffic flow, and traffic will be transmitted on a best effort basis.

20) Peak Cell Rate (cells/sec) for CLP=0+1

This value is only relevant if you enter **False** on line 3, **Requested Tx Best Effort**. In this field you specify the Peak Cell Rate (PCR), in cells per second, allowed for traffic transmitted on this VCC. The PCR is the fastest cell rate allowed on the connection. When using Peak Cell Rate, the bandwidth of an ATM uplink port can be partitioned among multiple connections each with a dedicated bandwidth. The ATM driver calculates the best rate nearest to the requested rate that the ATM hardware can support. This rate is shown using the **vvc** command. The CLP=0+1 in this field means that both high priority (CLP=0) and low priority (CLP=1) cells will be checked for PCR. Chapter 42, “Managing Cell Switching Modules (CSMs),” of this manual contains further information on CLP, which is the acronym for “Cell Loss Priority.”

5) Requested Rx Qos Class

The Quality of Service (QoS) for cells received (from destination to source) on this virtual circuit. For ATM uplink connections to an ATM switch only the **Unspecified** QoS is supported. This QoS receives data on a best effort basis; bandwidth is not guaranteed, but as much data as possible will be received as long as bandwidth is available.

6) Requested Rx Best Effort:

This field indicates whether you want this port to receive traffic on a “best effort” basis or to use a Peak Cell Rate (PCR) parameter. If you select True (option **2**), then the port will receive traffic if any bandwidth is available on the port. If you select False (option **1**), then the PCR parameter will be used. You enter a PCR value in line 20 of this screen. If data cannot be received at the PCR you specify, then this VCC will not be operational.

7) Requested RX Traffic Descriptor

The traffic descriptor to be used. Only the **NoCLPNoSCR** traffic descriptor is supported. **NoCLP-NoSCR** requires you to enter the Peak Cell Rate (PCR) on line 20. However, if you select **True** on line 6 (**Requested Rx Best Effort**), then the PCR will not be used to determine traffic flow, and traffic will be received on a best effort basis.

30) Peak Cell Rate (cells/sec) for CLP=0+1

This value is only relevant if you enter **False** on line 6, **Requested Rx Best Effort**. In this field you specify the Peak Cell Rate (PCR), in cells per second, allowed for traffic received on this VCC. The PCR is the fastest cell rate allowed on the connection. When using PCR, the bandwidth of an ATM uplink port can be partitioned among multiple connections each with dedicated bandwidth. The ATM driver calculates the best rate nearest to the requested rate that the ATM hardware can support. This rate is shown using the **vvc** command. The CLP=0+1 in this field means that both high priority (CLP=0) and low priority (CLP=1) cells will be checked for PCR.

8)Acceptable Tx QoS Class — 13)Acceptable Rx Traffic Descriptor

Definitions for fields 8 through 14, 40, and 50 are similar to those for fields 2 through 7, 20, and 30, respectively. The parameters are the same except these values specify your minimum acceptable thresholds. You do not have to enter any parameters for fields 8 through 13.

However, if you do, the ATM software will use them to determine whether traffic can be sent on this VCC. If software determines your acceptable values cannot be met, then the VCC will not be operational.

14) Tx Maximum Frame Size

The maximum frame size for traffic transmitted on this connection. Frames are composed of ATM cells. You specify the largest possible frame size, in bytes, in the field. If a frame exceeds this size, it will be discarded and counted as an error in statistics tables. The value in this field must be greater than zero (0), but less than the **Tx Frame Buffer Size**, which is specified through the **map** command.

15) Rx Maximum Frame Size

The maximum frame size for traffic received on this connection. Frames are composed of ATM cells. You specify the largest possible frame size, in bytes, in the field. If a frame exceeds this size it will be discarded and counted as an error in statistics tables. The value in this field must be greater than zero (0), but less than the **Rx Frame Buffer Size**, which is specified through the **map** command.

Modifying a Virtual Channel Connection

You can modify any parameters for a virtual circuit that you previously configured. The **mvc** command enables you to modify a virtual circuit. It uses the same screens and allows you to change the same parameters as the **cvc** command.

To begin modifying a virtual circuit, enter **mvc** followed by the slot number, a slash (/), and the port number for the virtual circuit. After the slot and port number, leave a space, then specify the Virtual Channel Identifier (VCI). For example, the following command specifies to modify a virtual circuit with a VCI of 100 on the first port on the module in slot 5:

```
mvc 5/1 100
```

For more information on the **mvc** screens and parameters, see *Creating a Virtual Channel Connection* on page 35-12.

Deleting a Virtual Channel Connection

To delete a virtual channel connection enter **dvc** followed by the slot number of the ATM access port where the circuit was set up, the physical port number for the circuit, and the VCI of the circuit. For example, if wanted to delete virtual channel 100 on port 1 of an ATM access module in slot 5, you would enter:

```
dvc 5/1 100
```

Note that there is a space between the slot/port specification and the VCI specification. After you specify to delete a circuit, you will receive a message asking you to confirm the deletion:

```
Remove ATM Slot 5 Port 1 Connection 100 (n)? :
```

Stop the deletion by pressing **<Enter>** or entering **N** at this prompt. A message similar to the following displays:

```
ATM Slot 5 Port 1 Connection 100 not removed
```

Confirm the deletion by entering a **Y** at the confirmation prompt. The VPI or VCI will be removed and a message similar to the following displays:

```
Removing ATM Slot 5 Port 1 Connection 100, please wait...
```

```
ATM Slot 5 Port 1 Connection 100 removed
```


Creating a Virtual ATM Address

The **cva** command allows you to create a virtual ATM address in this switch. To create an ATM address, enter **cva** followed by the a 40-character ATM address.

The following command creates the address **1234342525675845624198645276452354672456**

```
cva 1234342525675845624198645276452354672456
```

and displays a screen similar to the following:

Connection Address 1234342525675845624198645276452354672456 Configuration

1) Description (30 chars max)	: Address 2
2) Requested Tx QoS Class { Unspecified(0) }	: Unspecified
3) Requested TX Best Effort { False (1), True (2) }	: True
4) Requested Tx Traffic Descriptor { NoCLPNoSCR(2) }	: NoCLP NoSCR
20) Peak Cell Rate (cells/sec) for CLP=0+1	: 353208
5) Requested Rx QoS Class { Unspecified(0) }	: Unspecified
6) Requested RX Best Effort { False (1), True (2) }	: True
7) Requested Rx Traffic Descriptor { NoCLPNoSCR(2) }	: NoCLP NoSCR
30) Peak Cell Rate (cells/sec) for CLP=0+1	: 353208
14) Tx Maximum Frame Size	: 4520
15) Rx Maximum Frame Size	: 4520

Enter (option=value/save/cancel) :

The options in this screen are the same as those used in the **cvc** command. Refer to the section, *Creating a Virtual Channel Connection* on page 35-12 for a description of these parameters.

Once you have set up values in these fields you should enter **save** and press <Return>. The ATM address will then be created with the values you entered and the following message will display:

Creating address connection, please wait...

An index number will be assigned to this address. This index number is useful. It allows you to refer to this address using other commands without typing in the entire 40-byte address. You can see the index number assigned to the address using the **vva** command, which provides information on all configured virtual ATM addresses in the switch. The **vva** command is described in *Viewing Virtual ATM Addresses* on page 35-36.

Modifying Virtual ATM Addresses

You can modify parameters for a virtual ATM address that you previously configured through the **mva** command. The **mva** command uses the same screens and allows you to change the same parameters as the **cva** command.

To begin modifying an ATM address, enter **mva** followed by the index number assigned to the ATM address. You can view the index numbers for ATM addresses through the **vva** command, which is described in *Viewing Virtual ATM Addresses* on page 35-36. For example, you would enter the command

mya 2

to modify the virtual ATM address with an index number of 2. You can also enter the entire ATM address after the **mva** command if you prefer.

For more information on the **mva** parameters, see *Creating a Virtual Channel Connection* on page 35-12. Once you have set up values you should enter **save** and press <Return>.

Deleting a Virtual ATM Address

To delete an ATM virtual address enter **dva** followed by the index number of the address you want to delete. You can obtain the index number for an address through the **vva** command, which is described in *Viewing Virtual ATM Addresses* on page 35-36. For example, to delete the virtual ATM address with an index number of 4, you would enter:

dva 4

After you specify to delete an address, you will receive a message asking you to confirm the deletion:

Remove Address 4 (n)? :

Stop the deletion by pressing **<Enter>** or entering **N** at this prompt. A message similar to the following displays:

address xxxxxxxxxxxxxxxxxxxxxxxxaaaaaaaaabbbbbbbbbb not deleted

Confirm the deletion by entering a **Y** at the confirmation prompt. The address will be removed and a message similar to the following displays:

address index 4 removed

Viewing ATM Port Configuration Information

The **vap** command allows you to view basic information on a single ATM access port or all ATM access ports in a switch chassis. To view ATM access port configuration information, enter **vap** at a system prompt. The following is a sample display.

ATM Port Table

Slot	Port	ATM Port Description	Conn Type	Tran Type	Media Type	UNI Typ	Max VCC
2	1	ATM PORT	SVC	--	--	Pri	1023 10
2	2	ATM PORT	PVC	--	--	Pri	1023 10
5	1	ATM PORT	SVC	STS12	Multi	Pri	1023 10
6	1	ATM PORT	SVC	STS3c	Multi	Pri	1023 10

Slot	Port	Loopback Cfg	Tx Clk Source
2	1	NoLoop	LocalTiming
2	2	NoLoop	LocalTiming
5	1	NoLoop	LocalTiming
6	1	NoLoop	LocalTiming

Slot	Port	ATM Network Prefix	End System Identifier	Sig Ver	Sig VCI	ILMI Enable	ILMI VCI	ILMI Poll
2	1	3903488001bc90000101dbd400	0020da98e910	3.0	5	True	16	Off
2	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	1	3903488001bc90000101dbcfa0	0020dace0660	3.1	5	True	16	Off
6	1	00000000000000000000000000000000	0020dab344f0	3.0	5	True	16	Off

Status

Slot	Port	Sscop Up	Sscop Down	Up	Dn	Status
2	1	WED SEP 29 10:03:37 1999	WED SEP 29 10:03:32 1999	2	1	Up
2	2	-----	-----	0	0	Down
5	1	WED SEP 29 10:10:53 1999	WED SEP 29 10:10:46 1999	50	49	Up
6	1	-----	-----	0	0	Down

Slot	Port	Ilmi Up	Ilmi Down	Up	Dn	Status
2	1	WED SEP 29 10:03:30 1999	-----	1	0	Up
2	2	-----	-----	0	0	Down
5	1	WED SEP 29 10:02:51 1999	-----	1	0	Up
6	1	-----	-----	0	0	Down

Slot	Port	Phy Up	Phy Down	Up	Dn	Status
2	1	WED SEP 29 10:02:11 1999	-----	1	0	Enb (SVC)
2	2	WED SEP 29 10:01:46 1999	-----	1	0	Enb (CTL)
5	1	WED SEP 29 10:02:25 1999	-----	1	0	Enb (PVC)
6	1	-----	-----	0	0	Dis (R)

Slot	Port	Tx SegSz	Rx Seg Sz	Tx Buff Sz	Rx Buff Sz
2	1	16384	16384	4600	4600
2	2	8192	8192	8192	8192
5	1	131072	131072	4600	4600
6	2	131072	131072	4600	4600

Slot	Port	Primary	ATM HSM3 Secondary	Redundant FailOver	Port Status Reason of Last Failover
5	1	Active	Inactive	0	

Description, **Conn Type** (Connection type). These fields are described earlier in *Modifying an ATM Access Port Configuration* on page 35-7.

Tran Type. The transmission, or connection, type. Possible transmission types are **STS3c** (OC-3), **STS12c** (OC-12), **DS3**, **E3**, and -- (unknown type).

Media Type. The physical connector type used on this port. Possible types in this column are **Multi** (multimode fiber), **Single** (single mode fiber), **STP** (shielded twisted pair), **UTP** (unshielded twisted pair), **Coax** (coaxial cable), and **UNKN** (unknown connector).

UNI Typ (UNI type), **Max VCC**, **VCI Bits** (maximum VCI bits). These fields are described in *Modifying an ATM Access Port Configuration* on page 35-7.

Loopback Cfg. The loopback configuration for this port.

NoLoop	No loopback occurs between receive and transmission paths.
DiagLoop	Interface transmission path is connected to receive path at the connectors. The port receives its own transmission rather than the signal coming over the cable.
LineLoop	The interface receive path is looped to the transmission path at the connectors. The signal on the receive connector is not passed into the UNI and processed.

Tx Clk Source (timing mode). This field is described in *Modifying an ATM Access Port Configuration* on page 35-7.

ATM Network Prefix. The network prefix portion of the ATM address.

End System Identifier. The end station identifier (ESI) portion of the ATM address.

The following column headings fall under the table heading labeled **Status**.

SSCOP. The current state of the Service-Specific Connection Oriented Protocol (SSCOP). SSCOP operates on the ATM control plane and is a peer-to-peer protocol that helps set up connections and provides a reliable transport mechanism for signaling. The **Sscop Up** and **Sscop Down** columns will indicate the last time SSCOP last came up and went down, respectively. The **Up** and **Dn** (down) columns will indicate the number of times SSCOP came up and went down, respectively. The SSCOP **Status** column will indicate Up or Down. This value will always indicate **Down** if the Connection Type configured on this port is PVC.

ILMI. The Integrated Local Management Interface (ILMI) enabled on this port. The **Ilmi Up** and **Ilmi Down** columns will indicate the last time ILMI last came up and went down, respectively. The **Up** and **Dn** (down) columns will indicate the number of times ILMI came up and went down, respectively. The ILMI **Status** column will indicate Up or Down. This value will always indicate **Dn** if the Connection Type configured on this port is PVC.

PHY. The operational status of the port. The **Phy Up** and **Phy Down** columns will indicate the last time PHY last came up and went down, respectively. The **Up** and **Dn** (down) columns will indicate the number of times PHY came up and went down, respectively. The PHY **Status** column will indicate whether the port is **Enabled** or **Disabled** and provides information on upper service layers. The port will be enabled if the port is connected on this end and the far end. If there is a disconnection at either end, then the operational status will be **Disabled**. Possible values are as follows:

Enb (PVC)	Port is enabled to support PVCs.
Enb (SVC)	Port is enabled to support SVCs.
Enb (CTL)	Port is enabled to pass control signals.
Dis (R)	The receive is disabled on this port.
Dis (T/R)	Both the transmit and receive are disabled.
Dis (T)	Disabled transmit on this port.

Sig Ver, **Sig VCI**, **ILMI Enable**, **ILMI VCI**, **ILMI Poll**, **Tx Seg Sz** (transmit SAR buffer size), **Rx Seg Sz** (receive SAR buffer size), **Tx Buff Sz** (transmit frame buffer size), **Rx Buff Sz** (receive frame buffer size) are described in *Modifying an ATM Access Port Configuration* on page 35-7.

The column headings under the table heading labeled **ATM HSM3 Redundant Port Status** display only if you have an ASM2 with a redundant port on an HSM3 motherboard.

Primary. Indicates whether the primary port is active or inactive. If the primary port experiences a failover (activating the secondary port), it will remain inactive and will re-activate only when both its failover has been repaired *and* the secondary port experiences a failover

Secondary. Indicates whether the secondary port is active or inactive. If it is active, the primary port has experienced a failover.

FailOver. The total number of failovers that has occurred.

Reason of Last Failover. A brief explanation of the most recent failover. Port failovers occur, for example, when there is a physical disconnection. The following is an example of a **Reason of Last Failover** message: **SgnlLoss Cell Loss**.

Information on the Ports for One ATM Access Module

To view basic information on all ATM access ports in a single ATM access module, you enter the **vap** command along with the slot number for the ATM access module, as follows:

```
vap <slot>
```

where **<slot>** is the slot number where the ATM access module is installed. For example, if you wanted to obtain status information for the module in slot 2, you would enter:

```
vap 2
```

This command displays a screen similar to the following:

ATM Port Table									
Slot	Port	ATM Port Description		Conn Type	Tran Type	Media Type	UNI Typ	Max VCC	VCI bits
2	1	ATM PORT		SVC	--	--	Pri	1023	10
2	2	ATM PORT		PVC	--	--	Pri	1023	10

Slot	Port	Loopback	Cfg	Tx Clk Source
2	1	NoLoop		LocalTiming
2	2	NoLoop		LocalTiming

Slot	Port	ATM Network Prefix	End System Identifier	Sig Ver	Sig VCI	ILMI Enable	ILMI VCI	ILMI Poll
2	1	3903488001bc90000101dbd400	0020da98e910	3.0	5	True	16	Off
2	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Status									
Slot	Port	Sscop Up		Sscop Down		Up	Dn	Status	
2	1	WED SEP 29 10:03:37 1999		WED SEP 29 10:03:32 1999		2	1	Up	
2	2	-----		-----		0	0	Down	

Slot	Port	Ilmi Up		Ilmi Down		Up	Dn	Status	
2	1	WED SEP 29 10:03:30 1999		-----		1	0	Up	
2	2	-----		-----		0	0	Down	

Slot	Port	Phy Up		Phy Down		Up	Dn	Status	
2	1	WED SEP 29 10:02:11 1999		-----		1	0	Enb (SVC)	
2	2	WED SEP 29 10:01:46 1999		-----		1	0	Enb (CTL)	

Slot	Port	Tx SegSz	Rx SegSz	Tx Buff Sz	Rx Buff Sz
2	1	16384	16384	4600	4600
2	2	8192	8192	8192	8192

Descriptions of the columns included in this display are described earlier in *Viewing ATM Port Configuration Information* on page 35-19.

Information on One Port

To view information on a single ATM access port, you enter the **vap** command along with the slot number for the ATM access module and the port number for which you want to receive information, as follows:

```
vap <slot>/<port>
```

where **<slot>** is the slot number where the ATM access module is installed and **<port>** is the port number on the ATM access module. For example, if you wanted to view basic information for port 1 on the ATM access module in slot 2, you would enter:

```
vap 2/1
```

This command displays a screen similar to the following:

ATM Port Table											
Slot	Port	ATM Port Description				Conn Type	Tran Type	Media Type	UNI Typ	Max VCI	
2	1	ATM PORT				SVC	--	--	Pri	1023 10	
Slot	Port	Loopback Cfg		Tx Clk Source							
2	1	NoLoop		LocalTiming							
Slot	Port	ATM Network Prefix				End System Identifier	Sig Ver	Sig VCI	ILMI Enable	ILMI VCI Poll	
2	1	3903488001bc90000101dbd400				0020da98e910	3.0	5	True	16 Off	
Status											
Slot	Port	Sscop Up				Sscop Down			Up	Dn	Status
2	1	WED SEP 29 10:03:37 1999				WED SEP 29 10:03:32 1999			2	1	Up
Slot	Port	Ilmi Up				Ilmi Down			Up	Dn	Status
2	1	WED SEP 29 10:03:30 1999				-----			1	0	Up
Slot	Port	Phy Up				Phy Down			Up	Dn	Status
2	1	WED SEP 29 10:02:11 1999				-----			1	0	Enb (SVC)
Slot	Port	Tx SegSz	Rx Seg Sz	Tx Buff Sz	Rx Buff Sz						
2	1	16384	16384	4600	4600						

Descriptions of the columns included in this display are described earlier in *Viewing ATM Port Configuration Information* on page 35-19.

Viewing SSCOP, ILMI, and PHY

You can view general and detailed Service-Specific Connection Oriented Protocol (SSCOP), Interim Local Management protocol (ILMI), and Physical information on all ATM access ports in a switch, a single ATM access module, and individual ports. The **vap** command is used to provide this information.

Viewing SSCOP, ILMI, and PHY Information on All Ports

To view SSCOP, ILMI, and PHY information on all ATM access ports in a switch, you enter the **vap** command along with the following parameters:

vap sip

where **s** indicates SSCOP, **i** indicates ILMI, and **p** indicates PHY. This command displays a screen similar to the following:

ATM Port Table									
Slot	Port	ATM Port Description	Conn Type	Tran Type	Media Type	UNI Typ	Max VCI	VCC bits	
2	1	ATM PORT	SVC	--	--	Pri	1023	10	
2	2	ATM PORT	PVC	--	--	Pri	1023	10	
5	1	ATM PORT	SVC	STS12	Multi	Pri	1023	10	
6	1	ATM PORT	SVC	STS3c	Multi	Pri	1023	10	
Slot	Port	Loopback Cfg	Tx Clk Source						
2	1	NoLoop	LocalTiming						
2	2	NoLoop	LocalTiming						
5	1	NoLoop	LocalTiming						
6	1	NoLoop	LocalTiming						
Slot	Port	ATM Network Prefix	End System Identifier	Sig Ver	Sig VCI	ILMI Enable	ILMI VCI	ILMI Poll	
2	1	3903488001bc90000101dbd400	0020da98e910	3.0	5	True	16	Off	
2	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5	1	3903488001bc90000101dbcfa0	0020dace0660	3.1	5	True	16	Off	
5	1	0000000000000000000000000000	0020dab344f0	3.0	5	True	16	Off	
Status									
Slot	Port	Sscop Up		Sscop Down		Up	Dn	Status	
2	1	WED SEP 29 10:03:37 1999		WED SEP 29 10:03:32 1999		2	1	Up	
2	2	-----		-----		0	0	Down	
5	1	WED SEP 29 10:10:53 1999		WED SEP 29 10:10:46 1999		50	49	Up	
6	1	-----		-----		0	0	Down	
Slot	Port	Ilmi Up		Ilmi Down		Up	Dn	Status	
2	1	WED SEP 29 10:03:30 1999		-----		1	0	Up	
2	2	-----		-----		0	0	Down	
5	1	WED SEP 29 10:02:51 1999		-----		1	0	Up	
6	1	-----		-----		0	0	Down	
Slot	Port	Phy Up		Phy Down		Up	Dn	Status	
2	2	WED SEP 29 10:01:46 1999		-----		1	0	Enb (CTL)	
Slot	Port	Phy Up		Phy Down		Up	Dn	Status	
5	1	WED SEP 29 10:02:25 1999		-----		1	0	Enb (PVC)	
6	1	-----		-----		0	0	Dis (R)	

— Output continues on next page —

Slot	Port	Tx SegSz	Rx Seg Sz	Tx Buff Sz	Rx Buff Sz
2	1	16384	16384	4600	4600
2	2	8192	8192	8192	8192
5	1	131072	131072	4600	4600
6	1	131072	131072	4600	4600

Slot	Port	Primary	ATM HSM3 Secondary	Redundant FailOver	Port Status Reason of Last Failover
5	1	Active	Inactive	0	

Additionally, you may enter the parameters for SSCOP, ILMI, and PHY in any order and combination. For example, if you wanted to view only the ILMI and PHY, you enter the **vap** command along with the respective parameters as follows:

vap ip

or

vap pi

This command displays a screen similar to the following:

ATM Port Table						
		Status				
		=====				
Slot	Port	Ilmi Up	Ilmi Down	Up	Dn	Status
2	1	WED SEP 29 10:03:30 1999	-----	1	0	Up
2	2	-----	-----	0	0	Down
5	1	WED SEP 29 10:02:51 1999	-----	1	0	Up
6	1	-----	-----	0	0	Down
Slot	Port	Phy Up	Phy Down	Up	Dn	Status
2	1	WED SEP 29 10:02:11 1999	-----	1	0	Enb (SVC)
2	2	WED SEP 29 10:01:46 1999	-----	1	0	Enb (CTL)
5	1	WED SEP 29 10:02:25 1999	-----	1	0	Enb (PVC)
6	1	-----	-----	0	0	Dis (R)
Slot	Port	Tx SegSz	Rx Seg Sz	Tx Buff Sz	Rx Buff Sz	
2	1	16384	16384	4600	4600	
2	2	8192	8192	8192	8192	
5	1	131072	131072	4600	4600	
6	1	131072	131072	4600	4600	
Slot	Port	Primary	ATM HSM3 Secondary	Redundant FailOver	Port Status Reason of Last Failover	
5	1	Active	Inactive	0		

Descriptions of the columns included in the two displays above are described earlier in *Viewing ATM Port Configuration Information* on page 35-19.

Viewing SSCOP, ILMI, and PHY Information on One ATM Access Module

To view SSCOP, ILMI, and PHY information on a single ATM access module in a switch, you enter the **vap** command along with the slot number for the ATM access module and the following parameters:

vap <slot> sip

where **<slot>** is the slot number where the ATM access module is installed, **s** indicates SSCOP, **i** indicates ILMI, and **p** indicates PHY. For example, if you wanted to view SSCOP, ILMI, and PHY information for the module in slot 2, you would enter:

vap 2 sip

This command displays a screen similar to the following:

ATM Port Table									
Slot	Port	ATM Port Description	Conn Type	Tran Type	Media Type	UNI Typ	Max VCC	VCI bits	
2	1	ATM PORT	SVC	--	--	Pri	1023	10	
2	2	ATM PORT	PVC	--	--	Pri	1023	10	

Slot	Port	Loopback Cfg	Tx Clk Source
2	1	NoLoop	LocalTiming
2	2	NoLoop	LocalTiming

Slot	Port	ATM Network Prefix	End System Identifier	Sig Ver	Sig VCI	ILMI Enable	ILMI VCI	ILMI Poll
2	1	3903488001bc90000101dbd400	0020da98e910	3.0	5	True	16	Off
2	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Status									
Slot	Port	Sscop Up		Sscop Down		Up	Dn	Status	
2	1	WED SEP 29 10:03:37 1999		WED SEP 29 10:03:32 1999		2	1	Up	
2	2	-----		-----		0	0	Down	

Slot	Port	Ilmi Up		Ilmi Down		Up	Dn	Status	
2	1	WED SEP 29 10:03:30 1999		-----		1	0	Up	
2	2	-----		-----		0	0	Down	

Slot	Port	Phy Up		Phy Down		Up	Dn	Status	
2	1	WED SEP 29 10:02:11 1999		-----		1	0	Enb (SVC)	
2	2	WED SEP 29 10:01:46 1999		-----		1	0	Enb (CTL)	

Slot	Port	Tx SegSz	Rx Seg Sz	Tx Buff Sz	Rx Buff Sz
2	1	16384	16384	4600	4600
2	2	8192	8192	8192	8192

Additionally, you may enter the parameters for SSCOP, ILMI, and PHY in any order and combination. For example, if you wanted to view the statistics for only SSCOP and ILMI for a single board, you enter the **vap** command along with the slot number and the respective parameters as follows:

vap <slot> si

or

vap <slot> is

Descriptions of the columns included in the display above are described earlier in *Viewing ATM Port Configuration Information* on page 35-19.

Viewing SSCOP, ILMI, and PHY Information on One Port

To view SSCOP, ILMI, and PHY information on a single ATM access port, you enter the **vap** command along with the slot number for the ATM access module, the port number for which you want to receive information, and the following parameters:

vap <slot>/<port> sip

where **<slot>** is the slot number where the ATM access module is installed, **<port>** is the port number on the ATM access module, **s** indicates SSCOP, **i** indicates ILMI, and **p** indicates PHY. For example, if you wanted to view SSCOP, ILMI, and PHY information for port 1 on the ATM access module in slot 2, you would enter:

vap 2/1 sip

This command displays a screen similar to the following:

ATM Port Table									
Slot	Port	ATM Port Description			Conn Type	Tran Type	Media Type	UNI Typ	Max VCI VCC bits
2	1	ATM PORT			SVC	--	--	Pri	1023 10

Slot	Port	Loopback Cfg	Tx Clk Source	
2	1	NoLoop	LocalTiming	

Slot	Port	ATM Network Prefix	End System Identifier	Sig Ver	Sig VCI	ILMI Enable	ILMI VCI	ILMI Poll
2	1	3903488001bc90000101dbd400	0020da98e910	3.0	5	True	16	Off

Status									
Slot	Port	Sscop Up			Sscop Down			Up	Dn Status
2	1	WED SEP 29 10:03:37 1999			WED SEP 29 10:03:32 1999			2	1 Up

Slot	Port	Ilmi Up			Ilmi Down			Up	Dn Status
2	1	WED SEP 29 10:03:30 1999			-----			1	0 Up

Slot	Port	Phy Up			Phy Down			Up	Dn Status
2	1	WED SEP 29 10:02:11 1999			-----			1	0 Enb (SVC)

Slot	Port	Tx SegSz	Rx Seg Sz	Tx Buff Sz	Rx Buff Sz
2	1	16384	16384	4600	4600

Additionally, you may enter the parameters for SSCOP, ILMI, and PHY in any order and combination. For example, if you want to view the statistics for only SSCOP and PHY for a single ATM access port, you enter the **vap** command along with the slot number, the port number for which you want to receive information, and the respective parameters as follows:

vap <slot>/<port> sp

or

vap <slot>/<port> ps

Descriptions of the columns included in the display above are described earlier in *Viewing ATM Port Configuration Information* on page 35-19.

Viewing Virtual Channel Connections

The **vvc** command provides information on all VCIs associated with a given FCSM internal logical port or ATM module port. If you also have CSM modules in the OmniSwitch chassis, then a separate display is shown (below the ATM access ports section) for the VCIs associated with these ATM *switched* ports. Descriptions of CSM module columns can be found in Chapter 42, “Managing Cell Switching Modules (CSMs).”

The following is sample of the output from a **vvc** display for ATM access ports.

ATM Connections									
Slot	Port	VPI	VCI	Connection Description	Conn Type	Circuit Type	Operational Status		
3	1	0	100	Connection 100	VCC	PVC	LocalDown		
7	1	0	5	Connection 5	VCC	PVC	LocalUp End2endUnknown		
7	1	0	16	Connection 16	VCC	PVC	LocalUp End2endUnknown		
7	1	0	100	Connection 100	VCC	PVC	LocalDown		
7	2	0	100	Connection 100	VCC	PVC	LocalDown		
7	2	0	1015	Connection 1015	VCC	PVC	LocalUp End2endUnknown		
7	2	0	1016	Connection 1016	VCC	PVC	LocalUp End2endUnknown		
7	2	0	1017	Connection 1017	VCC	PVC	LocalUp End2endUnknown		
7	2	0	1019	Connection 1019	VCC	PVC	LocalUp End2endUnknown		
7	2	0	1022	Connection 1022	VCC	PVC	LocalUp End2endUnknown		

Slot	Port	VPI	VCI	Up Time		Down Time	Tx Max Frame Sz	Rx Max Frame Sz
3	1	0	100	THU JAN	01 00:00:00		4600	4600
7	1	0	5	WED FEB	17 15:59:30		4600	4600
7	1	0	16	WED FEB	17 15:59:30		4600	4600
7	1	0	100	THU JAN	01 00:00:00		4600	4600
7	2	0	100	THU JAN	01 00:00:00		2000	2000
7	2	0	1015	WED FEB	17 16:00:15		2048	2048
7	2	0	1016	WED FEB	17 16:00:15		2048	2048
7	2	0	1017	WED FEB	17 16:00:20		2000	2000
7	2	0	1019	WED FEB	17 16:00:15		2048	2048
7	2	0	1022	WED FEB	17 16:00:13		2048	2048

Actual Tx Traffic Information									
Slot	Port	VPI	VCI	Tx Traffic Descrip Type		Peak Cell Rate	Tx QoS	Best Effort	
3	1	0	100	NoCLP	NoSCR	0	Uns	True	
7	1	0	5	NoCLP	NoSCR	353208	Uns	True	
7	1	0	16	NoCLP	NoSCR	353208	Uns	True	
7	1	0	100	NoCLP	NoSCR	0	Uns	True	
7	2	0	100	NoCLP	NoSCR	0	Uns	True	
7	2	0	1015	NoCLP	NoSCR	353208	Uns	True	
7	2	0	1016	NoCLP	NoSCR	353208	Uns	True	
7	2	0	1017	NoCLP	NoSCR	353208	Uns	True	
7	2	0	1019	NoCLP	NoSCR	353208	Uns	True	
7	2	0	1022	NoCLP	NoSCR	353208	Uns	True	

— Output continues on next page —

Actual Rx Traffic Information

Slot	Port	VPI	VCI	Rx Traffic Descrip Type	Peak Cell Rate	Rx QoS	Best Effort
=====	=====	=====	=====	=====	=====	=====	=====
3	1	0	100	NoCLP NoSCR	0	Uns	True
7	1	0	5	NoCLP NoSCR	353208	Uns	True
7	1	0	16	NoCLP NoSCR	353208	Uns	True
7	1	0	100	NoCLP NoSCR	0	Uns	True
7	2	0	100	NoCLP NoSCR	0	Uns	True
7	2	0	1015	NoCLP NoSCR	353208	Uns	True
7	2	0	1016	NoCLP NoSCR	353208	Uns	True
7	2	0	1017	NoCLP NoSCR	353208	Uns	True
7	2	0	1019	NoCLP NoSCR	353208	Uns	True
7	2	0	1022	NoCLP NoSCR	353208	Uns	True

+ ==> PVC Connections

* ==> SVC Connections which cannot be modified by the user

@ ==> Soft PVC Connections

& ==> Control Connections

VPI. The virtual path identifier for this virtual channel. This virtual path defaults to **0** for ATM access connections.

VCI. The virtual channel identifier for this virtual channel. For PVCs, this value is specified during the virtual channel creation procedure via the **cvc** command. Some commonly used VCI are 5 (for signalling) and 16 (for ILMI).

Connection Description. A textual description of up to 30 characters for this virtual connection. Entered through the **cvc** command.

Connection Type. Indicates whether this connection is a virtual path or a virtual channel. All ATM access connections, or uplink connections, are virtual channels. Therefore, this column will always display as **VCC** (Virtual Channel Connection).

Circuit Type. The circuit type is configured with the **map** command. All circuit types on a single ATM port will be the same. The circuit type can be either **PVC** (Permanent Virtual Circuit) or **SVC** (Switched Virtual Circuit).

Operational Status. The current operational status of this virtual connection. This status will display as one of the following:

Unknown	The switch cannot tell if either the local or remote end of this connection is operational.
End2endUp	Remote end is operational. This value displays only if the end-to-end status of this connection is known.
End2endDown	Remote end is not operational. This value displays only if the end-to-end status of this connection is known.
LocalUp, End2endUnknown	Only local information is known. The local end of the connection is operational, but the switch cannot tell if the remote end is up or down.
LocalDown	Only local information is known. The local end of the connection is not operational.

◆ Note ◆

PVCs will always have an operational status in which the remote end status is unknown (i.e., **LocalUp,End2endUnknown** or **LocalDown**).

Up Time. The time and date when this virtual channel became active.

Down Time. The time and date when this virtual channel became inactive.

TX Max Frame Sz and **Rx Max Frame Sz**. Descriptions for these variables are provided in the section, *Creating a Virtual Channel Connection*.

Traffic information is supplied for Transmit (Tx) and Receive (Rx) traffic. These variables are **Tx/Rx Traffic Descrip Type**, **Peak Cell Rate**, **Tx/Rx QoS**, and **Best Effort**. Descriptions for these variables are provided in *Creating a Virtual Channel Connection* on page 35-12.

Information on the Ports for One ATM Access Module

To view status information on virtual circuits in a single ATM access module, you enter the **vvc** command along with the slot number for the ATM access module, as follows:

```
vvc <slot>
```

where **<slot>** is the slot number where the ATM access module is installed. For example, if you wanted to view status information for the board in slot 7, you would enter:

```
vvc 7
```

This command displays a screen similar to the following:

ATM Connections									
Slot	Port	VPI	VCI	Connection Description	Conn Type	Circuit Type	Operational Status		
7	1	0	5	Connection 5	VCC	PVC	LocalUp	End2endUnknown	
7	1	0	16	Connection 16	VCC	PVC	LocalUp	End2endUnknown	
7	1	0	100	Connection 100	VCC	PVC	LocalDown		
7	2	0	100	Connection 100	VCC	PVC	LocalDown		
7	2	0	1015	Connection 1015	VCC	PVC	LocalUp	End2endUnknown	
7	2	0	1016	Connection 1016	VCC	PVC	LocalUp	End2endUnknown	
7	2	0	1017	Connection 1017	VCC	PVC	LocalUp	End2endUnknown	
7	2	0	1019	Connection 1019	VCC	PVC	LocalUp	End2endUnknown	
7	2	0	1022	Connection 1022	VCC	PVC	LocalUp	End2endUnknown	

Slot	Port	VPI	VCI	Up Time	Down Time	Tx Max Frame Sz	Rx Max Frame Sz
7	1	0	5	WED FEB 17 15:59:30		4600	4600
7	1	0	16	WED FEB 17 15:59:30		4600	4600
7	1	0	100	THU JAN 01 00:00:00		4600	4600
7	2	0	100	THU JAN 01 00:00:00		2000	2000
7	2	0	1015	WED FEB 17 16:00:15		2048	2048
7	2	0	1016	WED FEB 17 16:00:15		2048	2048
7	2	0	1017	WED FEB 17 16:00:20		2000	2000
7	2	0	1019	WED FEB 17 16:00:15		2048	2048
7	2	0	1022	WED FEB 17 16:00:13		2048	2048

— Output continues on next page —

Viewing Virtual Channel Connections

Actual Tx Traffic Information

Slot	Port	VPI	VCI	Tx Traffic		Peak	Tx	Best
				Descrip	Type	Cell Rate	QoS	Effort
7	1	0	5	NoCLP	NoSCR	353208	Uns	True
7	1	0	16	NoCLP	NoSCR	353208	Uns	True
7	1	0	100	NoCLP	NoSCR	0	Uns	True
7	2	0	100	NoCLP	NoSCR	0	Uns	True
7	2	0	1015	NoCLP	NoSCR	353208	Uns	True
7	2	0	1016	NoCLP	NoSCR	353208	Uns	True
7	2	0	1017	NoCLP	NoSCR	353208	Uns	True
7	2	0	1019	NoCLP	NoSCR	353208	Uns	True
7	2	0	1022	NoCLP	NoSCR	353208	Uns	True

Actual Rx Traffic Information

Slot	Port	VPI	VCI	Rx Traffic		Peak	Rx	Best
				Descrip	Type	Cell Rate	QoS	Effort
7	1	0	5	NoCLP	NoSCR	353208	Uns	True
7	1	0	16	NoCLP	NoSCR	353208	Uns	True
7	1	0	100	NoCLP	NoSCR	0	Uns	True
7	2	0	100	NoCLP	NoSCR	0	Uns	True
7	2	0	1015	NoCLP	NoSCR	353208	Uns	True
7	2	0	1016	NoCLP	NoSCR	353208	Uns	True
7	2	0	1017	NoCLP	NoSCR	353208	Uns	True
7	2	0	1019	NoCLP	NoSCR	353208	Uns	True
7	2	0	1022	NoCLP	NoSCR	353208	Uns	True

+ ==> PVC Connections

* ==> SVC Connections which cannot be modified by the user

@ ==> Soft PVC Connections

& ==> Control Connections

Descriptions of the columns included in this display are described earlier in *Viewing Virtual Channel Connections* on page 35-28.

Information on One Port

To view status information on virtual circuits in a single ATM access port, you enter the **vvc** command along with the slot number for the ATM access module and the port number for which you want to receive information, as follows:

vvc <slot>/<port>

where **<slot>** is the slot number where the ATM access module is installed and **<port>** is the port number on the ATM access module. For example, if you wanted to view status information for port 1 on the ATM access module in slot 7, you would enter:

vvc 7/1

This command displays a screen similar to the following:

ATM Connections									
Slot	Port	VPI	VCI	Connection Description		Conn Type	Circuit Type	Operational Status	
7	1	0	5	Connection 5		VCC	PVC	LocalUp	End2endUnknown
7	1	0	16	Connection 16		VCC	PVC	LocalUp	End2endUnknown
7	1	1	100	Connection 100		VCC	PVC	LocalDown	
Slot	Port	VPI	VCI	Up Time		Down Time		Tx Max Frame Sz	Rx Max Frame Sz
7	1	0	5	WED FEB 17 15:59:30				4600	4600
7	1	0	16	WED FEB 17 15:59:30				4600	4600
7	1	1	100	THU JAN 01 00:00:00				4600	4600
Actual Tx Traffic Information									
Slot	Port	VPI	VCI	Tx Traffic Descrip Type		Peak Cell Rate	Tx QoS	Best Effort	
7	1	0	5	NoCLP	NoSCR	353208	Uns	True	
7	1	0	16	NoCLP	NoSCR	353208	Uns	True	
7	1	1	100	NoCLP	NoSCR		0	Uns	True
Actual Rx Traffic Information									
Slot	Port	VPI	VCI	Rx Traffic Descrip Type		Peak Cell Rate	Rx QoS	Best Effort	
7	1	0	5	NoCLP	NoSCR	353208	Uns	True	
7	1	0	16	NoCLP	NoSCR	353208	Uns	True	
7	1	1	100	NoCLP	NoSCR		0	Uns	True
+ ==> PVC Connections									
* ==> SVC Connections which cannot be modified by the user									
@ ==> Soft PVC Connections									
& ==> Control Connections									

Descriptions of the columns included in this display are described earlier in *Viewing Virtual Channel Connections* on page 35-28.

Information on One Virtual Path

To view status information on a single virtual path, you enter the **vvc** command along with the slot number for the ATM access module, the port number, and the VPI number for the virtual path on which you want information, as follows:

vvc <slot>/<port> <vpi>

where **<slot>** is the slot number where the ATM access module is installed, **<port>** is the port number on the ATM access module, and **<vpi>** is the virtual path identifier. For example, if you wanted to view status information for the board in slot 5, port 4, VPI 0, you would enter:

vvc 7/1 0

This command displays a screen similar to the following:

ATM Connections									
Slot	Port	VPI	VCI	Connection Description	Conn Type	Circuit Type	Operational Status		
7	1	0	5	Connection 5	VCC	PVC	LocalUp	End2endUnknown	
7	1	0	16	Connection 16	VCC	PVC	LocalUp	End2endUnknown	
Slot	Port	VPI	VCI	Up Time	Down Time	Tx Max Frame Sz		Rx Max Frame Sz	
7	1	0	5	WED FEB 17 15:59:30		4600		4600	
7	1	0	16	WED FEB 17 15:59:30		4600		4600	
Actual Tx Traffic Information									
Slot	Port	VPI	VCI	Tx Traffic Descrip	Type	Peak Cell Rate	Tx QoS	Best Effort	
7	1	0	5	NoCLP	NoSCR	353208	Uns	True	
7	1	0	16	NoCLP	NoSCR	353208	Uns	True	
Actual Rx Traffic Information									
Slot	Port	VPI	VCI	Rx Traffic Descrip	Type	Peak Cell Rate	Rx QoS	Best Effort	
7	1	0	5	NoCLP	NoSCR	353208	Uns	True	
7	1	0	16	NoCLP	NoSCR	353208	Uns	True	
+ ==> PVC Connections									
* ==> SVC Connections which cannot be modified by the user									
@ ==> Soft PVC Connections									
& ==> Control Connections									

Descriptions of the columns included in this display are described earlier in *Viewing Virtual Channel Connections* on page 35-28.

Information on One Virtual Channel

To view status information on a single virtual channel, you enter the **vvc** command along with the slot number for the ATM access module, the port number, the VPI number, and VCI number for the virtual path on which you want information, as follows:

vvc <slot>/<port> <vpi>/<vci>

where **<slot>** is the slot number where the ATM access module is installed, **<port>** is the port number on the ATM access module, **<vpi>** is the virtual path identifier, and **<vci>** is the virtual channel identifier. For example, if you wanted to view status information for the board in slot 5, port 4, VPI 0, and VCI 16, you would enter:

vvc 5/4 0/16

This command displays a screen similar to the following:

ATM Connections									
Slot	Port	VPI	VCI	Connection Description	Conn Type	Circuit Type	Operational Status		
7	1	0	5	Connection 5	VCC	PVC	LocalUp	End2end	Unknown
7	1	0	16	Connection 16	VCC	PVC	LocalUp	End2end	Unknown
Slot	Port	VPI	VCI	Up Time	Down Time	Tx Max Frame Sz		Rx Max Frame Sz	
7	1	0	5	WED FEB 17 15:59:30		4600		4600	
7	1	0	16	WED FEB 17 15:59:30		4600		4600	
Actual Tx Traffic Information									
Slot	Port	VPI	VCI	Tx Traffic Descrip	Type	Peak Cell Rate	Tx QoS	Best Effort	
7	1	0	5	NoCLP	NoSCR	353208	Uns	True	
7	1	0	16	NoCLP	NoSCR	353208	Uns	True	
Actual Rx Traffic Information									
Slot	Port	VPI	VCI	Rx Traffic Descrip	Type	Peak Cell Rate	Rx QoS	Best Effort	
7	1	0	5	NoCLP	NoSCR	353208	Uns	True	
7	1	0	16	NoCLP	NoSCR	353208	Uns	True	
+ ==> PVC Connections									
* ==> SVC Connections which cannot be modified by the user									
@ ==> Soft PVC Connections									
& ==> Control Connections									

Descriptions of the columns included in this display are described earlier in *Viewing Virtual Channel Connections* on page 35-28.

Viewing Virtual ATM Addresses

The **vva** command allows you to view information on all ATM addresses in an OmniSwitch. The **vva** display provides information on all end system addresses associated with a given FCSM internal logical port or ATM uplink port. The following is sample of the output from a **vva** display.

ATM Addresses							
Addr Indx	ATM Address						Description
====	=====						=====
1	1234567890987654321234567890987654321234						Address 1
2	1234342525675845624198645276452354672486						Address 2

Addr Indx	VPI	VCI	Conn Type	VC Type	TxMax SDU	Rx Max SDU	Arp Server
====	===	=====	=====	=====	=====	=====	=====
1	0	0000	VCC	SVC	4520	4520	False
2	0	0000	VCC	SVC	4520	4520	False

Requested Tx Traffic Information				
Addr Indx	Tx Traffic Descriptor Type	Peak Rate	Tx QoS	Best Effort
====	=====	=====	=====	=====
1	NoCLP NoSCR	353208	Uns	True
2	NoCLP NoSCR	353208	Uns	True

Requested Rx Traffic Information				
Addr Indx	Rx Traffic Descriptor Type	Peak Rate	Rx QoS	Best Effort
====	=====	=====	=====	=====
1	NoCLP NoSCR	353208	Uns	True
2	NoCLP NoSCR	353208	Uns	True

Acceptable Tx Traffic Information				
Addr Indx	Tx Traffic Descriptor Type	Peak Rate	Tx QoS	Best Effort
====	=====	=====	=====	=====
1	NoCLP NoSCR	353208	Uns	True
2	NoCLP NoSCR	353208	Uns	True

Acceptable Rx Traffic Information				
Addr Indx	Rx Traffic Descriptor Type	Peak Rate	Rx QoS	Best Effort
====	=====	=====	=====	=====
1	NoCLP NoSCR	353208	Uns	True
2	NoCLP NoSCR	353208	Uns	True

Addr Indx. An index that you can use to identify ATM addresses in this display. The index numbers are consistent throughout the rows in this display.

ATM Address. The ATM address for which QoS parameters were configured in the **cva** command.

Description. A textual description of up to 30 characters for this virtual connection. Entered through the **cva** command.

VPI. The virtual path identifier for this ATM address. This virtual path defaults to **0** for ATM access connections.

VCI. The virtual channel identifier for this ATM address. This value is specified during the virtual channel creation procedure via the **cva** command.

Conn Type. Connection Type. Indicates whether this connection is a virtual path or a virtual channel. All ATM access connections, or uplink connections, are virtual channels. Therefore, this column will always display as **VCC** (Virtual Channel Connection).

VC Type. The virtual channel type is configured with the **map** command. All circuit types for each ATM port will be the same. The circuit type can be either **PVC** (Permanent Virtual Circuit) or **SVC** (Switched Virtual Circuit).

Tx Max SDU. The maximum frame size for traffic transmitted on this connection. This value is configured via the **cva** command.

Rx Max SDU. The maximum frame size for traffic received on this connection. This value is configured via the **cva** command.

Arp Server. Indicates whether this address is an ARP server.

Traffic information is supplied for Transmit (Tx) and Receive (Rx) traffic. These variables are **Tx/Rx Traffic Descriptor Type**, **Peak Rate**, **Tx/Rx QoS**, and **Best Effort**. Descriptions for these variables are provided in the section, *Creating a Virtual Channel Connection* on page 35-12.

Viewing the ATM Layer Statistics Table

The **vls** command displays the ATM Layer Statistics Table. This table includes information at the ATM Service Data Unit (SDU), ATM cell, and octet level. Information for SDUs, which are composed of cells, are directly related to statistics for cells. When an SDU is counted, the cells in that SDU are counted and then added to the corresponding cell count.

The following is a sample **vls** display:

ATM Layer Statistics							
Slot	Port	Rx SDUs	Tx SDUs	Rx Cells	Tx Cells	Rx Octets	Tx Octets
=====	=====	=====	=====	=====	=====	=====	=====
2	1	0	6716	0	15775	0	757200
2	2	4104	13108	6945	18357	333360	881136
5	1	0	0	0	0	0	0
5	2	0	0	0	0	0	0

Rx SDUs. The number of Service Data Units received on this port.

Tx SDUs. The number of Service Data Units transmitted on this port.

Rx Cells. The number of cells received on this port. The value is derived from the **Rx SDUs** statistic. Once an SDU is received on the port, the cells in the SDU are counted and added to this statistic.

Tx Cells. The number of cells transmitted on this port. The value is derived from the **Tx SDUs** statistic. Once an SDU is transmitted on the port, the cells in the SDU are counted and added to this statistic.

Rx Octets. The number of octets, or bytes, received in the form of SDUs on this port.

Tx Octets. The number of octets, or bytes, transmitted in the form of SDUs on this port.

Viewing the ATM Layer Rx Error Statistics Table

The **vlrs** command displays the ATM Layer Rx (Receive) Error Statistics Table for each ATM access port. This table includes discard and error information at the ATM Service Data Unit (SDU), or frame, level and the ATM cell level.

Note that statistics for SDUs, which are composed of cells, are directly related to statistics for cells. When an SDU error or discard is counted, the cells in that SDU are counted and then added to the corresponding cell discard or error statistic for each port.

The following is a sample **vlrs** display:

ATM Layer Rx SDU Error Statistics							
Slot	Port	Discards	Errors	Invalid Sz	No Buffers	Trash	CRC Errors
3	1	0	0	0	0	0	0
3	2	0	0	0	0	0	0
7	1	0	0	0	0	0	0
7	2	0	0	0	0	0	0

ATM Layer Rx Cell Error Statistics						
Slot	Port	Discards	Errors	No Buffers	Trash	CRC Errors
3	1	0	0	0	0	0
3	2	0	0	0	0	0
7	1	0	0	0	0	0
7	2	0	0	0	0	0

SDU Discards. The number of Service Data Units (SDU), or frames, that have been discarded due to one of the following reasons: an invalid size error, CRC error, invalid format error, the frame was larger than the receive SAR buffer, or the frame was larger than the maximum size allowed on this port. Invalid size and CRC errors are also displayed in this table and described below. An invalid format error occurs when a frame is received in the wrong format. For example, a PTOP frame may be received that should be in 1483 format but instead is in Private encapsulation. The receive SAR buffer size (**Rx SAR Buffer Size**) is configured through the **map** command. The maximum frame size allowed on this port is configured through the **cvc** or **mvc** command.

SDU Errors. The number of Service Data Units that had one or more of the following errors: invalid size, invalid format, frame larger than SAR buffer size, CRC error, or the frame was larger than that allowed on this port. This error statistic will typically match the **SDU Discards** statistic.

SDU Invalid Size. The number of Service Data Units, or frames, received that are either larger than the receive frame buffer or had an AAL5 length mismatch. One cell in an SDU contains an AAL trailer that includes a length field; an AAL5 mismatch error occurs when that length field is incorrect. The receive frame buffer size (**Rx Frame Buffer Size**) is configured through the **map** command.

SDU No Buffers. The number of SDUs that were discarded because there was no room in the receive frame buffer. Note that the SDUs counted in this statistic are not included in the **Rx SDU Discards** or **Errors** statistics in the **vlrs** display. The receive frame buffer size (**Rx Frame Buffer Size**) may be configured through the **map** command.

SDU Trash. The number of Service Data Units that were discarded at the ATM physical layer. These SDUs were discarded by the Segmentation and Reassembly (SAR) due to a lack of reassembly buffer space. Note that the SDUs counted in this statistic are not included in the **Rx SDU Discards** or **Errors** statistics in the **vlrs** display.

SDU CRC Errors. The number of SDUs received with errors in the CRC (cyclical redundancy check) header. This error is counted in the **Rx SDU Discards** and **Errors** columns of the **vlrs** display.

Cell Discards. The total number of cells discarded as a result of SDU Discards. SDUs are discarded due to invalid size, CRC errors, invalid format, frame size larger than SAR buffer, or frame size larger than allowed on this port. For each SDU discarded, the number of cells within that SDU are counted and then added to this statistic.

Cell Errors. The total number of cells within SDUs that had one or more of the following errors: invalid size, invalid format, frame larger than SAR buffer size, CRC error, or the frame was larger than that allowed on this port. For each errored SDU, the number of cells within that SDU are counted and then added to this statistic.

Cell No Buffers. The total number of cells that were discarded because there was no room in the receive frame buffer. Note that the cells counted in this statistic are not included in the **Rx Cell Discards** or **Errors** statistics in the **vlrs** display.

Cell Trash. The total number of cells that were discarded at the ATM physical layer. These cells were discarded by the Segmentation and Reassembly (SAR) due to a lack of reassembly buffer space. Note that the cells counted in this statistic are not included in the **Rx Cell Discards** or **Errors** statistics in the **vlrs** display.

Cell CRC Errors. The number of cells received with errors in the CRC (cyclical redundancy check) header. This error is counted in the **Rx Cell Discards** and **Errors** columns of the **vlrs** display.

ATM Layer Receive Error Statistics Table For One ATM Access Module

To view the ATM Layer receive error statistics table on a single ATM access module, you enter the **vlrs** command along with the slot number for the ATM access module as follows:

vlrs <slot>

where **<slot>** is the slot number where the CSM board is installed. For example, if you wanted to obtain status information for the board in slot 3, you would enter:

vlrs 3

This command displays a screen similar to the following:

ATM Layer Rx SDU Error Statistics							
Slot	Port	Discards	Errors	Invalid Sz	No Buffers	Trash	CRC Errors
3	1	0	0	0	0	0	0
3	2	0	0	0	0	0	0

ATM Layer Rx Cell Error Statistics						
Slot	Port	Discards	Errors	No Buffers	Trash	CRC Errors
3	1	0	0	0	0	0
3	2	0	0	0	0	0

Descriptions of the columns included in this display are described earlier in *Viewing the ATM Layer Rx Error Statistics Table* on page 35-39.

ATM Layer Receive Error Statistics Table For One ATM Access Port

To view ATM Layer receive error statistics on a single ATM access port, you enter the **vlrs** command along with the slot number for the ATM access module and the port number for which you want to receive information, as follows:

```
vlrs <slot>/<port>
```

where **<slot>** is the slot number where the ATM access module is installed and **<port>** is the port number on the ATM access module. For example, if you wanted to view status information for port 2 on the ATM access module in slot 3, you would enter:

```
vlrs 3/2
```

This command displays a screen similar to the following:

ATM Layer Rx SDU Error Statistics							
Slot	Port	Discards	Errors	Invalid Sz	No Buffers	Trash	CRC Errors
3	2	0	0	0	0	0	0

ATM Layer Rx Cell Error Statistics						
Slot	Port	Discards	Errors	No Buffers	Trash	CRC Errors
3	2	0	0	0	0	0

Descriptions of the columns included in this display are described earlier in *Viewing the ATM Layer Rx Error Statistics Table* on page 35-39.

Viewing the ATM Layer Tx Error Statistics Table

The **vlts** command displays the ATM Layer Tx (Transmit) Error Statistics Table for each port. This table includes discard and error information at the ATM Service Data Unit (SDU), or frame, level and the ATM cell level.

Note that statistics for SDUs, which are composed of cells, are directly related to statistics for cells. When an SDU error or discard is counted, the cells in that SDU are counted and then added to the corresponding cell discard or error statistic.

The following is a sample **vlts** display.

ATM Layer Tx Error Statistics							
Slot	Port	Tx SDU Discards	Tx SDU Errors	Tx SDU No Buffers	Tx Cell Discards	Tx Cell Errors	Tx Cell No Buffers
====	====	=====	=====	=====	=====	=====	=====
2	1	0	0	0	0	0	0
2	2	0	0	0	0	0	0
5	1	0	0	0	0	0	0
5	2	0	0	0	0	0	0

Tx SDU Discards. The number of Service Data Units discarded because there was no room in the transmit SAR buffer or the SDU was larger than the transmit frame buffer. Transmit SAR buffer size (**Tx SAR Buffer Size**) and transmit frame buffer size (**Tx Frame Buffer Size**) are configured through the **map** command.

Tx SDU Errors. The number of Service Data Units that were received from the switch back-plane in an invalid format.

Tx SDU No Buffers. The number of SDUs that were discarded because there was no room in the transmit frame buffer to dequeue and attempt to transmit frames. Note that the SDUs counted in this statistic are not included in the **Tx SDU Discards** statistic. The transmit frame buffer size (**Tx Frame Buffer Size**) is configured through the **map** command.

Tx Cell Discards. The total number of cells discarded as a result of SDU Discards. SDUs are discarded because there is no room in the transmit SAR buffer, or the SDU was larger than the transmit frame buffer. For each SDU discarded, the number of cells within that SDU are counted and then added to this statistic.

Tx Cell Errors. The total number of cells within SDUs that were received from the switch back-plane in an invalid format.

Tx Cell No Buffers. The total number of cells within SDUs that were discarded because there was no room in the transmit frame buffer. Note that the cells counted in this statistic are not included in the **Tx Cell Discards** statistic.

ATM Layer Transmit Error Statistics Table For One ATM Access Module

To view the ATM Layer transmit error statistics table on a single ATM access module, you enter the **vlts** command along with the slot number for the ATM access module as follows:

```
vlts <slot>
```

where **<slot>** is the slot number where the ATM access module is installed. For example, if you wanted to obtain status information for the board in slot 5, you would enter:

```
vlts 5
```

This command displays a screen similar to the following:

ATM Layer Tx Error Statistics							
Slot	Port	Tx SDU Discards	Tx SDU Errors	Tx SDU No Buffers	Tx Cell Discards	Tx Cell Errors	Tx Cell No Buffers
====	====	=====	=====	=====	=====	=====	=====
5	1	0	0	0	0	0	0
5	2	0	0	0	0	0	0

Descriptions of the columns included in this display are described earlier in *Viewing the ATM Layer Tx Error Statistics Table* on page 35-43.

ATM Layer Transmit Error Statistics Table For One ATM Access Port

To view ATM Layer transmit error statistics on a single ATM access port, you enter the **vlts** command along with the slot number for the ATM access module and the port number for which you want to receive information, as follows:

```
vlts <slot>/<port>
```

where **<slot>** is the slot number where the ATM access module is installed and **<port>** is the port number on the ATM access board. For example, if you wanted to view status information for port 2 on the ATM access module in slot 5, you would enter:

```
vlts 5/2
```

This command displays a screen similar to the following:

ATM Layer Tx Error Statistics							
Slot	Port	Tx SDU Discards	Tx SDU Errors	Tx SDU No Buffers	Tx Cell Discards	Tx Cell Errors	Tx Cell No Buffers
====	====	=====	=====	=====	=====	=====	=====
5	2	0	0	0	0	0	0

Descriptions of the columns included in this display are described earlier in *Viewing the ATM Layer Tx Error Statistics Table* on page 35-43.

Viewing the ATM Connection Statistics Table

The **vcs** command displays the ATM Connection Statistics Table for each virtual channel. This table includes information at the ATM Service Data Unit (SDU), ATM cell, and octet level. Information for SDUs, which are composed of cells, are directly related to statistics for cells. When an SDU is counted, the cells in that SDU are counted and then added to the corresponding cell count.

◆ Note ◆

Information is displayed for a virtual channel only if that channel has been used for data transmission. If a virtual channel has been configured, but not used, then it will not be displayed by **vcs**.

The following is a sample **vcs** display:

ATM Connection Statistics								
Slot	Port	VCI	Rx SDUs	Tx SDUs	Rx Cells	Tx Cells	Rx Octets	Tx Octets
=====	=====	=====	=====	=====	=====	=====	=====	=====
2	1	100	0	6769	0	15892	0	762816
2	2	1002	0	349	0	1047	0	50256
2	2	1004	0	2445	0	2445	0	117360
2	2	1005	0	350	0	1050	0	50400
2	2	1007	0	2445	0	2445	0	117360
2	2	1008	350	350	1050	1050	50400	50400
2	2	1010	679	679	679	679	32592	32592
2	2	101	375	353	1142	1056	54816	50688
2	2	1013	679	681	679	681	32592	32688
2	2	1014	350	352	1050	1055	50400	50640
2	2	1016	681	682	681	682	32688	32736
2	2	1017	354	367	1058	1112	50784	53376
2	2	1019	679	679	679	679	32592	32592
2	2	1021	0	1052	0	2104	0	100992
2	2	1022	0	2452	0	2452	0	117696
7	1	5	6650	6671	6650	6921	319200	332208
7	1	16	462	472	924	944	44352	45312
7	2	1015	462	464	924	928	44352	44544
7	2	1016	6650	6651	6900	6651	331200	319248
7	2	1017	318	346	959	1027	46032	49296
7	2	1019	5212	5213	5212	5213	250176	250224
7	2	1022	6319	6321	6319	6321	303312	303408

Slot. The port's slot number.

Port. The port number.

VCI. The virtual channel identifier (VCI).

Rx SDUs. The number of Service Data Units received on this virtual channel.

Tx SDUs. The number of Service Data Units transmitted on this virtual channel.

Rx Cells. The number of cells received on this virtual channel. The value is derived from the **Rx SDUs** statistic. Once an SDU is received on the virtual channel, the cells in the SDU are counted and added to this statistic.

Tx Cells. The number of cells transmitted on this virtual channel. The value is derived from the **Tx SDUs** statistic. Once an SDU is transmitted on the virtual channel, the cells in the SDU are counted and added to this statistic.

Rx Octets. The number of octets, or bytes, received as SDUs on this virtual channel.

Tx Octets. The number of octets, or bytes, transmitted as SDUs on this virtual channel.

Information on the Ports for one ATM Access Module

To view status information on a single ATM access module, you enter the **vcs** command along with the slot number for the ATM access module, as follows:

```
vcs <slot>
```

where the **<slot>** is the slot number where the ATM access module is installed. For example, if you wanted to view status information for the ATM access module in slot 7, you would enter:

```
vcs 7
```

This command displays a screen similar to the following:

ATM Connection Statistics								
Slot	Port	VCI	Rx SDUs	Tx SDUs	Rx Cells	Tx Cells	Rx Octets	Tx Octets
====	====	====	=====	=====	=====	=====	=====	=====
7	1	5	6650	6671	6650	6921	319200	332208
7	1	16	462	472	924	944	44352	45312
7	2	1015	462	464	924	928	44352	44544
7	2	1016	6650	6651	6900	6651	331200	319248
7	2	1017	318	346	959	1027	46032	49296
7	2	1019	5212	5213	5212	5213	250176	250224
7	2	1022	6319	6321	6319	6321	303312	303408

Descriptions of the columns included in this display are described earlier in *Viewing the ATM Connection Statistics Table* on page 35-45.

Information on One Port

To view status information on a single ATM access port, you enter the **vcs** command along with the slot number for the ATM access module and the port number for which you want to receive information, as follows:

```
vcs <slot>/<port>
```

where **<slot>** is the slot number where the ATM access module is installed and **<port>** is the port number on the ATM access module. For example, if you want to view status information for port 2 on the ATM access module in slot 7, you would enter:

```
vcs 7/2
```

This command displays a screen similar to the following:

ATM Connection Statistics								
Slot	Port	VCI	Rx SDUs	Tx SDUs	Rx Cells	Tx Cells	Rx Octets	Tx Octets
====	====	====	=====	=====	=====	=====	=====	=====
7	2	1015	462	464	924	928	44352	44544
7	2	1016	6650	6651	6900	6651	331200	319248
7	2	1017	318	346	959	1027	46032	49296
7	2	1019	5212	5213	5212	5213	250176	250224
7	2	1022	6319	6321	6319	6321	303312	303408

Descriptions of the columns included in this display are described earlier in *Viewing the ATM Connection Statistics Table* on page 35-45.

Information on One Virtual Channel

To view status information on a single virtual channel, you enter the **vcs** command along with the slot number for the ATM access module, the port number, the VPI number, and the VCI number for the virtual channel on which you want information, as follows:

```
vcs <slot>/<port> <vpi>/<vci>
```

where **<slot>** is the slot number where the ATM access module is installed, **<port>** is the port number on the ATM access module, and **<vpi>** is the virtual path identifier, and **<vci>** is the virtual channel identifier. For example, if you wanted to obtain status information for the board in slot 7, port 2, VPI 0, and VCI 6650, you would enter:

```
vcs 7/2 0/1016
```

This command displays a screen similar to the following:

ATM Connection Statistics								
Slot	Port	VCI	Rx SDUs	Tx SDUs	Rx Cells	Tx Cells	Rx Octets	Tx Octets
====	====	====	=====	=====	=====	=====	=====	=====
7	2	1016	6650	6651	6900	6651	331200	319248

Descriptions of the columns included in this display are described earlier in *Viewing the ATM Connection Statistics Table* on page 35-45.

◆ Note ◆

Although the VPI number for an ATM access module is not displayed, it is always 0 by default. Therefore, in order to view status information on a single virtual channel, you must first enter 0 for the VPI number.

Viewing the ATM Connection Rx Error Statistics Table

The **vcrs** command displays the ATM Connection Rx (Receive) Error Statistics Table on a virtual channel-by-virtual channel basis. This table includes discard and error information at the ATM Service Data Unit (SDU), or frame, level and the ATM cell level for each virtual channel.

Note that statistics for SDUs, which are composed of cells, are directly related to statistics for cells. When an SDU error or discard is counted, the cells in that SDU are counted and then added to the corresponding cell discard or error statistic.

The following is a sample **vcrs** display:

ATM Connection Rx SDU Error Statistics

Slot	Port	VCI	Discards	Errors	Invalid Sz	No Buffers	Trash	CRC Errors
2	1	100	0	0	0	0	0	0
5	1	100	0	0	0	0	0	0
5	2	100	0	0	0	0	0	0

ATM Connection Rx Cell Error Statistics

Slot	Port	VCI	Discards	Errors	No Buffers	Trash	CRC Errors
2	1	100	0	0	0	0	0
5	1	100	0	0	0	0	0
5	2	100	0	0	0	0	0

Slot. The port's slot number.

Port. The port number.

VCI. The virtual channel identifier (VCI).

SDU Discards. The number of Service Data Units (SDU), or frames, that have been discarded due to one of the following reasons: an invalid size error or CRC error. Invalid size and CRC errors are also displayed in this table and described below. The receive SAR buffer size (**Rx SAR Buffer Size**) is configured through the **map** command. The maximum frame size allowed on this virtual connection is configured through the **cvc** or **mvc** command.

SDU Errors. The number of Service Data Units that had one or more of the following errors: an invalid size error or CRC error. This Error statistic will typically match the **SDU Discards** statistic.

SDU Invalid Size. The number of Service Data Units, or frames, received that are either larger than the receive frame buffer or had an AAL5 length mismatch. One cell in an SDU contains an AAL trailer that includes a length field; an AAL5 mismatch error occurs when that length field is incorrect. The receive frame buffer size (**Rx Frame Buffer Size**) is configured through the **map** command.

SDU No Buffers. This statistic is not supported and will display zeroes.

SDU Trash. This statistic is not supported and will display zeroes.

SDU CRC Errors. The number of SDUs received with errors in the CRC (cyclical redundancy check) header. This error is counted in the **Rx SDU Discards** and **Errors** columns of the **vcrs** display.

Cell Discards. The total number of cells discarded as a result of SDU discards. SDUs are discarded due to CRC errors only. For each SDU discarded, the number of cells within that SDU are counted and then added to this statistic.

Cell Errors. The total number of cells within SDUs that had one or more CRC errors. For each errored SDU, the number of cells within that SDU are counted and then added to this statistic.

Cell No Buffers. This statistic is not supported and will display zeroes.

Cell Trash. This statistic is not supported and will display zeroes.

Cell CRC Errors. The number of cells received with errors in the CRC (cyclical redundancy check) header. This error is counted in the **Rx Cell Discards** and **Errors** columns of the **vcrs** display.

Viewing the ATM Connection Tx Error Statistics Table

The **vcts** command displays the ATM Connection Tx (Transmit) Error Statistics Table on a virtual channel-by-virtual channel basis. This table includes discard and error information at the ATM Service Data Unit (SDU), or frame, level and the ATM cell level.

Note that statistics for SDUs, which are composed of cells, are directly related to statistics for cells. When an SDU error or discard is counted, the cells in that SDU are counted and then added to the corresponding cell discard or error statistic.

The following is a sample **vcts** display.

ATM Connection Tx Error Statistics

Slot	Port	VCI	Tx SDU Discards	Tx SDU Errors	Tx SDU No Buffers	Tx Cell Discards	Tx Cell Errors	Tx Cell No Buffers
2	1	100	0	0	0	0	0	0
2	2	1002	0	0	0	0	0	0
2	2	1004	0	0	0	0	0	0
2	2	1005	0	0	0	0	0	0
2	2	1007	0	0	0	0	0	0
2	2	1008	0	0	0	0	0	0
2	2	1010	0	0	0	0	0	0
2	2	1011	0	0	0	0	0	0
2	2	1013	0	0	0	0	0	0
2	2	1014	0	0	0	0	0	0
2	2	1016	0	0	0	0	0	0
2	2	1017	0	0	0	0	0	0
2	2	1019	0	0	0	0	0	0
2	2	1021	0	0	0	0	0	0
2	2	1022	0	0	0	0	0	0
5	1	100	0	0	0	0	0	0
5	2	100	0	0	0	0	0	0

Slot. The port's slot number.

Port. The port number.

VCI. The virtual channel identifier (VCI).

Tx SDU Discards. The number of Service Data Units discarded because there was no room in the transmit SAR buffer or the SDU was larger than the transmit frame buffer. Transmit SAR buffer size (**Tx SAR Buffer Size**) and transmit frame buffer size (**Tx Frame Buffer Size**) are configured through the **map** command.

Tx SDU Errors. The number of Service Data Units that were received from the switch backplane in an invalid format.

Tx SDU No Buffers. The number of SDUs that were discarded because there was no room in the transmit frame buffer to dequeue and attempt to transmit frames. Note that the SDUs counted in this statistic are not included in the **Tx SDU Discards** statistic. The transmit frame buffer size (**Tx Frame Buffer Size**) is configured through the **map** command.

Tx Cell Discards. The total number of cells discarded as a result of SDU Discards. SDUs are discarded because there is no room in the transmit SAR buffer, or the SDU was larger than the transmit frame buffer. For each SDU discarded, the number of cells within that SDU are counted and then added to this statistic.

Tx Cell Errors. The total number of cells within SDUs that were received from the switch back-plane in an invalid format.

Tx Cell No Buffers. The total number of cells within SDUs that were discarded because there was no room in the transmit frame buffer. Note that the cells counted in this statistic are not included in the **Tx Cell Discards** statistic.

Traffic Shaping (ASM2/ASX Modules)

Older ASM modules are capable of transmitting ATM cells on a “best effort” basis; that is, no specific traffic parameters can be set up for a given ASM port. Newer ASM2, FCSM II, and ASX module ports allow you to configure several traffic parameters. These parameters include the Peak Cell Rate (PCR), Sustaining Cell Rate (SCR), and Maximum Burst Size (MBS). Traffic shaping using these parameters takes place on data that is exiting (i.e., transmitted out) a switch port.

You can divide ASM2 and ASX ports into discrete “bandwidth groups” to which you can assign unique PCR, SCR, and MBS values. This feature, referred to as “traffic shaping,” can be configured on all Omni Switch/Router ATM access ports and on the following OmniSwitch ATM access modules:

- ASM2-155F
- ASM2-155RF
- ASM2-622F
- ASM2-622RF
- ASM2-DS3
- ASM2-E3
- FCSM II (ASM half)

◆ Note ◆

Traffic shaping is *not* supported on the FCSM I (FCSM-155).

On each ASM2 or ASX port you can configure up to eight (8) bandwidth groups. A bandwidth group is a reserved amount of bandwidth on the port. Bandwidth groups are ordered by priority, with bandwidth group 1 having the highest priority and bandwidth group 8 the lowest.

Bandwidth groups are associated with ATM services. When you configure any ATM service on an ASM2 or ASX port through the **cas** command, you are prompted for the bandwidth group to which the service will be associated. By default a service will be associated with bandwidth group 1. ATM services are described in Chapter 38, “Configuring ATM Services.”

Configuring ASM2/ASX Traffic Shaping

The **mbwg** command allows you to configure the transmit traffic parameters on an ASM2 or ASX port. The syntax for this command is as follows:

mbwg <slot>/<port> <bandwidth group number>

For example if you wanted to set up bandwidth group 1 on Port 1 of the ASM2 or ASX module in slot 4 you would enter

mbwg 4/1 1

Follow these steps to set up traffic parameters on an ASM2 or ASX port:

1. Enter **mbwg** followed by the slot number, a slash (/), the ASM2 or ASX port number and then the bandwidth group for which you want to configure parameters. A screen similar to the following displays:

```
The following service numbers use the current Traffic Descriptors
Changing any of the traffic descriptor values would result in
toggling status of the following service numbers...
1
```

Bandwidth allocation: Slot 4, Port 1, Bwgld=1

```

Tx Traffic parameters
1) Best Effort {False (1), True (2) }      : TRUE

```

Enter (option=value/save/cancel):

2. Enter **1=1** at the **Enter (option=value/save/cancel):** prompt to configure traffic parameters. If you enter **1=2**, then traffic will be transmitted on this bandwidth group on a “best effort” basis and you will not be able to configure traffic parameters. A screen similar to the following displays:

Bandwidth allocation: Slot 4, Port 1, Bwgld=1

```

Tx Traffic parameters
1) Best Effort {False (1), True (2) }      : FALSE
  11) Peak Cell Rate (PCR kbps)           : 540
  12) Sustained Cell rate (SCR kbps)      : 50
  13) Maximum Burst Size (MBS cells)      : 5

```

Enter (option=value/save/cancel):

You change a value in a field by entering the line number for the value, an equal sign (=), and then the new value for the variable. For example, to change the **Peak Cell Rate** field to **2000** you would enter an **11** (the line number for **Peak Cell Rate**), an equal sign, and then the new value as follows:

11=2000

This specification would provide 2 Megabits of bandwidth on this channel.

11) Peak Cell Rate (PCR kbps)

The maximum number of kilobits per second allowed on this bandwidth group. The PCR is specified for all types of ATM traffic. (The minimum value currently supported is 535.)

12) Sustained Cell Rate (SCR kbps)

The maximum *average* cell rate (in kilobits per second) allowed for traffic on this bandwidth group. The SCR is always less than or equal to the Peak Cell Rate. The SCR is not specified for Constant Bit Rate (CBR) traffic as this traffic requires a steady data flow at all times. For CBR traffic, the PCR is equal to the SCR. In the event that the PCR cannot be satisfied due to other configured channels, this channel should at least support the bandwidth you configure here for the SCR.

13) Maximum Burst Size (MBS cells)

The maximum number of cells that can be sent in a burst at the Peak Cell Rate. The MBS is not specified for CBR traffic. CBR traffic is constant and continuous, not bursty. (The valid range is 4 to 64.)

◆ Note ◆

If most of the traffic in a bandwidth group consists of very small packets (i.e., 64 bytes), then the actual speed achieved will be less than the values you configure for PCR, SCR, and MBS.

Viewing Traffic Shaping Parameters

The **vbwg** command allows you to view the traffic descriptor parameters for one or more ASM2 or ASX ports. When you enter

vbwg

a screen similar to the following displays:

Slot	Port	Bwg	Best Effort	PCR (kbps)	SCR (kbps)	MBS (cells)	Dependent Active Service Numbers
4	1	1	True	----	----	----	1
4	1	2	False	20000	20000	5	2
4	1	3	False	20000	20000	5	3
4	1	4	False	20000	20000	5	4
4	1	5	False	20000	20000	5	5
4	1	6	False	20000	20000	5	6
4	1	7	False	20000	20000	5	7
4	1	8	False	20000	20000	5	8
4	2	1	True	----	----	----	1
4	2	2	True	----	----	----	
4	2	3	True	----	----	----	
4	2	4	True	----	----	----	
4	2	5	True	----	----	----	
4	2	6	True	----	----	----	
4	2	7	True	----	----	----	
4	2	8	True	----	----	----	

Slot. The slot in the switch where this ASM2 or ASX module resides.

Port. The port on the ASM2 or ASX module for which information is supplied.

Bwg. The bandwidth group. You can configure up to eight bandwidth groups on each ASM2 or ASX port through the **mbwg** command. Bandwidth groups are ranked by priority with bandwidth group 1 having the highest priority and bandwidth group 8 having the lowest.

Best Effort. Indicates whether or not traffic will be transmitted from this port on a “best effort” basis. When set to **False**, data transmission will be based on the traffic descriptor parameters—PCR, SCR, and MBS—specified through the **mbwg** command. When set to **True**, traffic is transferred on a “Best Effort” basis.

PCR (kbps). The Peak Cell Rate, which is the maximum number of kilobits per second allowed on this bandwidth group.

SCR (kbps). The Sustained Cell Rate, which is the maximum average cell rate (in kilobits per second) allowed for traffic in this bandwidth group. The SCR is always less than or equal to the Peak Cell Rate.

MBS (cells). The Maximum Burst Size, which is the maximum number of cells that can be sent in a burst at the Peak Cell Rate.

Dependent Active Service Numbers. The number for the active ATM service to which this bandwidth group belongs. A bandwidth group is assigned to a service through the **cas** command. Only services that are currently active are displayed.

