PA-A1-OC3MM and PA-A1-OC3SM ATM Port Adapters

Description

Asynchronous Transfer Mode (ATM) port adapters (PA-A1-OC3MM and PA-A1-OC3SM) are available on Cisco 7200 series routers, on the second-generation Versatile Interface Processor (VIP2) in Cisco 7500 series routers, and in Cisco 7000 series routers with the 7000 Series Route Switch Processor (RSP7000) and 7000 Series Chassis Interface (RSP7000CI).

The ATM port adapter provides a single SONET/SDH OC-3 full-duplex interface (either multimode or single-mode intermediate reach) and supports data rates of up to 155 Mbps bidirectionally. The ATM port adapter connects to a SONET/SDH multimode or SONET/STC-3C single-mode optical fiber cable (STS-3C or STM-1 physical layer) to connect the router to an external DSU (an ATM network). The ATM port adapter supports the following features:

- Segmentation and Reassembly (SAR) of up to 512 buffers simultaneously, where each buffer represents a packet
- Up to 256 transmit buffers for simultaneous fragmentation
- Up to 2,048 SAR virtual circuits (VCs)
- ATM adaptation layer (AAL) 5
- Operation, Administration, and Maintenance (OAM) cells

Platforms

This feature is supported on these platforms:

- Cisco 7200 series
- Cisco 7500 series
- Cisco 7000 series routers with the RSP7000 and RSP7000CI

Configuration Tasks

For information on how to configure the PA-A1-OC3MM and PA-A1-OC3SM ATM interfaces, refer to the "Configuring ATM" chapter of the *Wide-Area Networking Configuration Guide*.

Because the ATM port adapter does not support traffic shaping, the *peak*, *average*, and *burst* rate options for the **atm pvc** interface configuration command are not available.

For information on other commands that can be used by the PA-A1-OC3MM and PA-A1-OC3SM ATM interfaces, refer to the Cisco IOS Release 11.2 configuration guides.

Configuration Examples

The examples in this section show the configuration needed to connect two ATM port adapters back to back. Two routers, each containing an ATM port adapter, can be connected directly with a standard cable, which allows you to verify the operation of the ATM port or to directly link the routers to build a larger node.

By default, the ATM port adapter expects a connected ATM switch to provide transmit clocking. To specify that the ATM port adapter generates the transmit clock internally for SONET PLIM operation, add the **atm clock internal** command to your configuration.

Note For SONET interfaces, one of the ATM port adapters in each router must be configured to supply its internal clock to the line.

The following example shows the configuration file commands for two Cisco 7200 series routers connected through their SONET interface. For additional ATM examples, refer to the "Cisco 7000 Family Configuration Examples" section in the "Configuring ATM" chapter of the *Wide-Area Networking Configuration Guide*.

First router:

```
interface ATM3/0
ip address 192.168.1.10 255.0.0.0
no keepalive
map-group atm-in
atm clock internal
atm pvc 1 1 5 aal5snap
!
map-list atm-in
ip 192.168.1.20 atm-vc 1 broadcast
```

Second router:

```
interface ATM3/0
ip address 192.168.1.20 255.0.0.0
no keepalive
map-group atm-in
atm clock internal
atm pvc 1 1 5 aal5snap
!
map-list atm-in
ip 192.168.1.10 atm-vc 1 broadcast
```

Command Reference

This section documents modified commands. All other commands used with this feature are documented in the Cisco IOS Release 11.2 command references.

- **atm clock internal**
- **atm pvc**
- **loopback**
- **show interfaces atm**

atm clock internal

To cause the ATM Interface Processor (AIP) or the ATM port adapter (PA-A1-OC3MM and PA-A1-OC3SM) to generate the transmit clock internally, use the **atm clock internal** interface configuration command. The **no** form of this command restores the default value.

atm clock internal
no atm clock internal

Syntax Description

This command has no arguments or keywords.

Default

The transmit clock signal from the remote connection (the line). The switch provides the clocking.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command was modified in Cisco IOS Release 11.2 P and 11.1 CA to add information on the PA-A1-OC3MM and PA-A1-OC3SM ATM port adapters.

This command is meaningless on a 4B/5B physical layer interface module (PLIM).

Example

The following example causes the interface to generate the transmit clock internally:

```
atm clock internal
```

atm pvc

To create a permanent virtual circuit (PVC) on the AIP or NPM interface, or on the ATM port adapter (PA-A1-OC3MM and PA-A1-OC3SM) and, optionally, to generate Operation, Administration, and Maintenance (OAM) F5 loopback cells or enable Inverse ATM ARP, use the **atm pvc** interface configuration command. The **no** form of this command removes the specified PVC.

atm pvc *vcd vpi vci aal-encap* [[*midlow midhigh*] [*peak average burst*]] [**oam** *seconds*] [**inarp** *minutes*]
no atm pvc *vcd vpi vci aal-encap* [[*midlow midhigh*] [*peak average burst*]] [**oam** *seconds*] [**inarp** [*minutes*]

Syntax Description

vcd — Virtual circuit descriptor. A unique number that identifies to the processor which VPI-VCI pair to use for a particular packet. Values range from 1 to the value set with the **atm maxvc** command. This feature is required to manage packet transmission. The *vcd* value is not associated with the VPI-VCI pair used for the ATM network cells.

vpi — ATM network virtual path identifier (VPI) of this PVC. On the Cisco 7000 series, this value ranges from 0 through 255; on the Cisco 4500 and Cisco 4700, this value ranges from 0 to (8192 divided by the value set by the **atm vc-per-vp** command) minus one. The VPI is an 8-bit field in the header of the ATM cell. The VPI value is unique only on a single link, not throughout the ATM network because it has local significance only. The VPI value must match that of the switch.

Both *vpi* and *vci* cannot be specified as 0; if one is 0, the other cannot be 0.

vci — ATM network virtual channel identifier (VCI) of this PVC, in the range of 0 through one less than the maximum value set for this interface by the **atm vc-per-vp** command. The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single link, not throughout the ATM network (it has local significance only).

Both *vpi* and *vci* cannot be specified as 0; if one is 0, the other cannot be 0.

aal-encap — ATM adaptation layer (AAL) and encapsulation type. When **aal5mux** is specified, a protocol is required. Possible values are as follows:

- **aal34smds**—Encapsulation for SMDS networks. This option is supported on the AIP, and is not available for the ATM port adapter.
- **aal5nlpid**—Encapsulation that allows ATM interfaces to interoperate with High-Speed Serial Interfaces (HSSIs) that are using an ATM data service unit (ADSU) and running ATM-Data Exchange Interface (DXI).
- **aal5mux decnet**—MUX-type virtual circuit.
- **aal5mux ip**—MUX-type virtual circuit.
- **aal5mux novell**—MUX-type virtual circuit.
- **aal5mux vines**—MUX-type virtual circuit.
- **aal5mux xns**—MUX-type virtual circuit.
- **aal5snap**—Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) precedes the protocol datagram. *This is the only encapsulation supported for Inverse ARP.*

- **ilmi**—Sets up communication with the ILMI; the associated *vpi* and *vci* values are ordinarily 0 and 16, respectively.
- **qsaal**—Signaling-type PVC used for setting up or tearing down SVCs; the associated *vpi* and *vci* values are ordinarily 0 and 5, respectively.

midlow (Optional) Starting message identifier (MID) number for this PVC. The default is 0. If you set the *peak*, *average*, and *burst* values, you must also set the *midlow* and *midhigh* values.

midhigh (Optional) Ending MID number for this PVC. The default is 0. If you set the *peak*, *average*, and *burst* values, you must also set the *midlow* and *midhigh* values.

peak (Optional) Maximum rate (in kbps) at which this virtual circuit can transmit data. Valid values are in the range from 1 to the maximum rate set for a rate queue. The value should match a value specified by the **atm rate-queue** command. If you set this value, you must also specify a value for the *average*, *burst*, *midlow,* and *midhigh* arguments.

This option is not available for the ATM port adapter.

average (Optional) Average rate (in kbps) at which this virtual circuit will transmit data. Valid values are in the range from 1 to the maximum rate set for a rate queue. If you set this value, you must also specify a value for the *peak*, *burst*, *midlow,* and *midhigh* arguments.

This option is not available for the ATM port adapter.

burst (Optional) Value (in the range 1 through 2047) that relates to the maximum number of ATM cells the virtual circuit can transmit to the network at the *peak* rate of the PVC. The actual burst cells equals *burst* * 32 cells, thereby allowing for a burst size of 32 cells to 65504 cells. The largest practical value of *burst* is the maximum transmission unit (MTU) size of the AIP card. If you set this value, you must also specify a value for the *peak* and *average* arguments.

This option is not available for the ATM port adapter.

oam *seconds* (Optional) Specifies how often to generate an OAM F5 loopback cell from this virtual circuit. The default value is 10 seconds.

inarp *minutes* (Optional) Specifies how often Inverse ARP datagrams will be sent on this virtual circuit. The default value is 15 minutes.

Defaults

If *peak* and *average* rates are omitted, the PVC defaults to the highest bandwidth rate queue available. *Peak* and *average* rates are then equal. By default, the virtual circuit is configured to run as fast as possible.

The default value of both *midlow* and *midhigh* is 0.

If the **oam** keyword is omitted, OAM cells are not generated. If the **oam** keyword is present but the *seconds* value is omitted, the default value of **oam** *seconds* is 10 seconds.

If the **inarp** keyword is missing, inverse ARPs are not generated. If the **inarp** keyword is present, but the timeout value is not given, then inverse ARPs are generated every 15 minutes.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0. The *midlow* and *midhigh* arguments first appeared in Cisco IOS Release 10.3. The **oam** *seconds* and **inarp** *minutes* commands first appeared in Cisco IOS Release 11.0.

This command was modified in Cisco IOS Release 11.2 P and 11.1 CA to add information on the PA-A1-OC3MM and PA-A1-OC3SM ATM port adapters.

Because the PA-A1-OC3MM and PA-A1-OC3SM ATM port adapters on Cisco 7200 series routers, on the second-generation Versatile Interface Processor (VIP2) in Cisco 7500 series routers, and on Cisco 7000 series routers with the 7000 Series Route Switch Processor (RSP7000) and 7000 Series Chassis Interface (RSP7000CI) do not support traffic shaping, the *peak, average,* and *burst* rate options are not available. For more information on the ATM port adapter, refer to the *PA-A1 ATM Port Adapter Installation and Configuration* publication.

The order of command options is important. The **inarp** keyword can be specified either separately or after **oam** has been enabled. The *peak*, *average*, and *burst* arguments, if specified, cannot be specified after either the **inarp** or the **oam** keywords.

The Cisco IOS software dynamically creates rate queues as necessary to satisfy the requests of **atm pvc** commands. The software dynamically creates a rate queue when an **atm pvc** command specifies a peak/average rate that does not match any user-configured rate queue.

The **atm pvc** command creates a PVC and attaches it to the VPI and VCI specified. Both *vpi* and *vci* cannot be specified as 0; if one is 0, the other cannot be 0. The *aal-encap* argument determines the AAL mode and the encapsulation method used. The *peak* and *average* arguments determine the rate queue used.

Use one of the **aal5mux** encapsulation options to dedicate the specified virtual circuit to a single protocol; use the **aal5snap** encapsulation option to multiplex two or more protocols over the same virtual circuit. Whether you select **aal5mux** or **aal5snap** encapsulation might depend on practical considerations, such as the type of network and the pricing offered by the network. If the network's pricing depends on the number of virtual circuits set up, **aal5snap** might be the appropriate choice. If pricing depends on the number of bytes transmitted, **aal5mux** might be the appropriate choice because it has slightly less overhead.

If you choose to specify any of the *peak*, *average,* and *burst* values, you must specify all three values. You can specify *midlow* and *midhigh* values only if you have also specified the *peak*, *average*, and *burst* values.

Message identifier (MID) numbers, which are available only with AAL3/4 (AIP only), are used by receiving devices to reassemble cells from multiple packets. You can assign different *midlow* to *midhigh* ranges to different PVCs to ensure that the message identifiers will be unique at the receiving end and, therefore, that messages can be reassembled correctly.

If you are configuring an SVC, this command is required to configure the PVC that handles the SVC call setup and termination. In this case, specify **qsaal** for the *aal-encap* argument. See the third example that follows.

The router generates and echoes OAM F5 loopback cells, which verify connectivity. After OAM cell generation is enabled, a cell is transmitted periodically. The remote end must respond by echoing back the cells.

The router does not generate alarm indication signal (AIS) cells, which are used for alarm surveillance functions. However, if it receives an AIS cell, it responds by sending an OAM Far-end Remote Failure (FERF) cell.

Examples

The following example creates a PVC with VPI 0, VCI 6, and uses AAL AAL5-MUX with IP protocol:

```
atm pvc 1 0 6 aal5mux ip
```

The following example creates a PVC with VPI 0, VCI 6, and uses AAL AAL3/4-SMDS protocol for an AIP:

```
atm pvc 1 0 6 aal34smds 0 15 150000 70000 10
```

The following example creates a PVC to be used for ATM signaling for an SVC, and specifies VPI 0 and VCI 5:

```
atm pvc 1 0 5 qsaal
```

Assuming that no static rate queue has been defined, the following example creates the PVC and also creates a dynamic rate queue with the peak rate set to the maximum allowed by the PLIM and the average set to equal the peak rate:

```
atm pvc 1 1 1 aal5snap
```

Assuming that no static rate queue has been defined, the following example creates the PVC and also creates a dynamic rate queue with the peak rate set to 100 Mbps (100,000 kbps), the average rate set to 50 Mbps (50,000 kbps), and a burst size of 64 cells (2 * 32 cells):

```
atm pvc 1 1 1 aal5snap 100000 50000 2
```

Related Commands

atm aal aal3/4
atm maxvc
atm multicast
atm rate-queue
atm smds
mtu

loopback

To place OC-3c, DS3, or E3 interfaces on the Cisco 7000 and Cisco 7500 series AIP into loopback mode, to place the interface on the PA-A1-OC3MM and PA-A1-OC3SM ATM port adapters on Cisco 7200 series routers, on the second-generation Versatile Interface Processor (VIP2) in Cisco 7500 series routers, and on Cisco 7000 series routers with the 7000 Series Route Switch Processor (RSP7000) and 7000 Series Chassis Interface (RSP7000CI), or to place OC-3c interfaces on the Cisco 4500 and Cisco 4700 NPM into loopback mode, use the following form of the **loopback** interface configuration command. Use the **no** form of this command to remove the loopback.

loopback [**diagnostic | line**]
no loopback [**diagnostic | line**]

To place E3 or DS3 interfaces on the Cisco 4500 and Cisco 4700 NPM into loopback mode, use the following form of the **loopback** interface configuration command. Use the **no** form of this command to remove the loopback.

loopback [**line | payload | cell | diagnostic**]
no loopback [**line | payload | cell | diagnostic**]

Syntax Description

diagnostic	(Optional) Places the interface into internal loopback at the PLIM.
line	(Optional) Places the interface into external loopback at the line. This is the default.
payload	(Optional) Places the interface into external loopback at the payload level.
cell	(Optional) Places the interface into external loopback at the cell level.

Default

line; packets loop from the ATM interface back to the ATM network.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

This command was modified in Cisco IOS Release 11.2 P and 11.1 CA to add information on the PA-A1-OC3MM and PA-A1-OC3SM ATM port adapters.

This command is useful for testing because it loops all packets from the ATM interface back to the interface as well as directing the packets to the network.

Example

The following example loops all packets back to the AIP or NPM:

```
loopback diagnostic
```

show interfaces atm

To display information about the ATM interface, use the **show interfaces atm** privileged EXEC command.

show interfaces atm [*slot*/*port*] (Cisco 7000 and Cisco 7200 series)
show interfaces atm [*slot*/*port-adapter*/*port*] (on VIP cards in Cisco 7000 series and Cisco 7500 series)

Syntax Description

slot	(Optional) Backplane slot number.
port-adapter	(Optional) Port adapter number on the VIP2, either 0 or 1.
port	(Optional) Interface port number. This is always 0.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command was modified in Cisco IOS Release 11.2 P and 11.1 CA to add information on the PA-A1-OC3MM and PA-A1-OC3SM ATM port adapters.

Sample Displays

The following is sample output from the **show interfaces atm** command:

```
Router# show interfaces atm 4/0
ATM4/0 is up, line protocol is up
  Hardware is cxBus ATM
  Internet address is 131.108.97.165, subnet mask is 255.255.255.0
  MTU 4470 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ATM, loopback not set, keepalive set (10 sec)
  Encapsulation(s): AAL5, PVC mode
  256 TX buffers, 256 RX buffers, 1024 Maximum VCs, 1 Current VCs
  Signalling vc = 1, vpi = 0, vci = 5
  ATM NSAP address: BC.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.13
  Last input 0:00:05, output 0:00:05, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     144 packets input, 3148 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     154 packets output, 4228 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets, 0 restarts
```

The following is sample output from the **show interfaces atm** command for the ATM port adapter on a Cisco 7500 series router:

```
Router# show interfaces atm 0/0/0
ATM0/0/0 is up, line protocol is up
  Hardware is cyBus ATM
  Internet address is 1.1.1.1/24
  MTU 4470 bytes, sub MTU 4470, BW 156250 Kbit, DLY 80 usec, rely 255/255, load 1/255
  Encapsulation ATM, loopback not set, keepalive set (10 sec)
  Encapsulation(s): AAL5, PVC mode
  256 TX buffers, 256 RX buffers,
  2048 maximum active VCs, 1024 VCs per VP, 1 current VCCs
  VC idle disconnect time: 300 seconds
  Last input never, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 1 packets/sec
  5 minute output rate 0 bits/sec, 1 packets/sec
     5 packets input, 560 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5 packets output, 560 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

Table 50 describes the fields shown in both the displays.

Table 50 Show Interfaces ATM Field Descriptions

Field	Description
ATM... is {up | down} ...is administratively down	Indicates whether the interface hardware is currently active (whether carrier detect is present) and if it has been taken down by an administrator.
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol think the line is usable (that is, whether keepalives are successful).
Hardware is	Hardware type.
Internet address is	Internet address and subnet mask.
MTU	Maximum Transmission Unit of the interface.
sub MTU	Maximum Transmission Unit of the subinterface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100% reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether the interface is configured for loopback testing.
keepalive set	This feature is not applicable for ATM interfaces.
Encapsulation(s)	Type of encapsulation used on the interface (for example, AAL5, and either PVC or SVC mode).

Table 50 Show Interfaces ATM Field Descriptions (Continued)

Field	Description
TX buffers	Number of buffers configured with the **atm txbuff** command.
RX buffers	Number of buffers configured with the **atm rxbuff** command.
Maximum active VCs	Maximum number of virtual circuits.
VCs per VP	Number of virtual circuits per virtual path (the default is 1024).
Current VCCs	Number of virtual circuits connections currently open.
VC idle disconnect time	Number of seconds the SVC must be idle before the SVC is disconnected.
Signaling VC	Number of the signaling PVC.
vpi	Virtual path identifier number.
vci	Virtual channel identifier number.
ATM NSAP address	NSAP address of the ATM interface.
keepalive	Indicates whether keepalives are set or not.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface failed.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	The time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31}ms (and less than 2^{32}ms) ago.
Queueing strategy	First-in, first-out queuing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.

Table 50 Show Interfaces ATM Field Descriptions (Continued)

Field	Description
Receive broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum may not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on the interface. This usually indicates a clocking problem between the interface and the data link equipment.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	This feature is not applicable for ATM interfaces.

Table 50 Show Interfaces ATM Field Descriptions (Continued)

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
output buffer failures	Number of times that a packet was not output from the output hold queue because of a shortage of MEMD shared memory.
output buffers swapped out	Number of packets stored in main memory when the output queue is full; swapping buffers to main memory prevents packets from being dropped when output is congested. The number is high when traffic is bursty.
restarts	Number of times the controller was restarted because of errors.

Supported MIBs

The ATM UNI specification defines the required MIB functionality for ATM interfaces. MIB attributes are readable and writable across the Interim Local Management Interface (ILMI) using Simple Network Management Protocol (SNMP). The ILMI uses SNMP, without UDP, and IP addressing along with the ATM MIB.

The ATM port adapter supports RFC 1213 and interface MIBs as specified in the ATM MIB V2 specification. Refer to the ATM UNI specification for additional details on the MIB.

What to Do Next

For more information on the PA-A1-OC3MM and PA-A1-OC3SM ATM port adapters, refer to the *PA-A1 ATM Port Adapter Installation and Configuration* publication.