ATM Commands

This chapter describes the commands available to configure an Asynchronous Transfer Mode (ATM) interface in the Cisco 7000 series routers and Cisco 4500 routers, and to configure a serial interface for ATM access in other routers.

For ATM configuration information and examples, refer to the chapter entitled "Configuring ATM" in the *Router Products Configuration Guide*.

atm aal aal3/4

To enable support for ATM adaptation layer 3/4 (AAL3/4) on an ATM interface, use the **atm aal aal3/4** interface configuration command.

atm aal aal3/4

Syntax Description

This command has no arguments or keywords.

Default

Support for AAL3/4 is disabled.

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500.

Only one virtual circuit can exist on a subinterface that is being used for AAL3/4 processing, and that virtual circuit must be an AAL3/4 virtual circuit.

The AAL3/4 support feature requires static mapping of all protocols except IP.

Example

The following example enables AAL3/4 on ATM interface 2/0:

```
interface atm2/0
ip address 131.108.177.178 255.255.255.0
atm aal aal3/4
```

Related Commands

atm multicast
atm mid-per-vc
atm pvc
atm smds
interface atm

atm backward-max-burst-size-clp0

To change the maximum number of high-priority cells coming from the destination router to the source router at the burst level on the switched virtual circuit (SVC), use the **atm backward-max-burst-size-clp0** map-class configuration command. The **no** form of this command restores the default.

> **atm backward-max-burst-size-clp0** *cell-count*
> **no atm backward-max-burst-size-clp0**

Syntax Description

cell-count	Maximum number of high-priority cells coming from the destination router at the burst level. Default is -1.

Default

-1. The router does not request this quality of service (QOS) parameter of the ATM switch, so the switch provides a "best effort service." The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

The keyword **clp0** indicates that this command affects only cells with a cell loss priority (CLP) of 0 (high-priority cells).

Example

The following example sets the maximum number of high-priority cells coming from the destination router at the burst level to 800 cells:

```
atm backward-max-burst-size-clp0 800
```

atm backward-max-burst-size-clp1

To request the maximum number of low-priority and high-priority cells coming from the destination router to the source router at the burst level on the SVC, use the
atm backward-max-burst-size-clp1 map-class configuration command. The **no** form of this command restores the default value.

> **atm backward-max-burst-size-clp1** *cell-count*
> **no atm backward-max-burst-size-clp1**

Syntax Description

cell-count	Maximum number of low-priority and high-priority cells coming from the destination router at the burst level. Default is –1.

Default

–1. The router does not request this traffic parameter of the ATM switch. The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on the Cisco 7000 series and Cisco 4500 series routers.

This command defines a traffic parameter for the SVC connection.

The suffix **clp1** applies to the cumulative flow of CLP0 and CLP1 (high-priority and low-priority) cells.

On the Cisco 7000 series, this parameter can be between 32 and 2106 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 series, this parameter can be between 1 and 65535 cells.

Example

The following example requests the maximum number of low-priority and high-priority cells coming from the destination router at the burst level to 100,000:

```
atm backward-max-burst-size-clp1 100000
```

atm backward-peak-cell-rate-clp0

To change the peak rate of high-priority cells coming from the destination router to the source router on the SVC, use the **atm backward-peak-cell-rate-clp0** map-class configuration command. The **no** form of this command restores the default.

> **atm backward-peak-cell-rate-clp0** *rate*
> **no atm backward-peak-cell-rate-clp0**

Syntax Description

rate	Maximum rate in kilobits per second (kbps) that this SVC can receive high-priority cells from the destination router. Default is -1. Maximum upper range is 155,000 kbps.

Default

-1. The router does not request this quality of service (QOS) parameter of the ATM switch, so the switch provides a "best effort service." The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

The keyword **clp0** indicates that this command affects only cells with a cell loss priority (CLP) of 0 (high-priority cells).

Example

The following example sets the peak rate for high-priority cells from the destination router to 8000 kbps:

```
atm backward-peak-cell-rate-clp0 8000
```

atm backward-peak-cell-rate-clp1

To request the peak rate of low-priority and high-priority cells coming from the destination router to the source router on the SVC, use the **atm backward-peak-cell-rate-clp1** map-class configuration command. The **no** form of this command restores the default.

> **atm backward-peak-cell-rate-clp1** *rate*
> **no atm backward-peak-cell-rate-clp1**

Syntax Description

rate	Maximum rate in kilobits per second (kbps) that this SVC can receive low-priority and high-priority cells from the destination router. Default is –1. Maximum upper range is 7,113,539 kbps (limited by 0xffffff cells-per-second).

Default

–1. The router does not request this traffic parameter of the ATM switch. The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on the Cisco 7000 series and Cisco 4500 series routers.

This command defines a traffic parameter for the SVC connection.

The suffix **clp1** applies to the cumulative flow of CLP0 and CLP1 (high-priority and low-priority) cells.

On the Cisco 7000 series, this parameter can be between 32 and 2106 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 series, this parameter can be between 1 and 65535 cells.

Example

The following example requests the peak rate for low-priority and high-priority cells from the destination router to 7000 kbps:

```
atm backward-peak-cell-rate-clp1 7000
```

atm backward-sustainable-cell-rate-clp0

To change the sustainable rate of high-priority cells coming from the destination router to the source router on the SVC, use the **atm backward-sustainable-cell-rate-clp0** map-class configuration command. The **no** form of this command restores the default.

> **atm backward-sustainable-cell-rate-clp0** *rate*
> **no atm backward-sustainable-cell-rate-clp0**

Syntax Description

rate	Sustainable rate in kilobits per second (kbps) that this SVC can receive high-priority cells from the destination router. Default is -1. Maximum upper range is 155,000 kbps.

Default

-1. The router does not request this quality of service (QOS) parameter of the ATM switch, so the switch provides a "best effort service." The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

The keyword **clp0** indicates that this command affects only cells with a cell loss priority (CLP) of 0 (high-priority cells).

Example

The following example sets the sustainable rate for high-priority cells from the destination router to 800 kbps:

```
atm backward-sustainable-cell-rate-clp0 800
```

atm backward-sustainable-cell-rate-clp1

To request the sustainable rate of low-priority and high-priority cells coming from the destination router to the source router on the SVC, use the **atm backward-sustainable-cell-rate-clp1** map-class configuration command. The **no** form of this command restores the default value.

> **atm backward-sustainable-cell-rate-clp1** *rate*
> **no atm backward-sustainable-cell-rate-clp1**

Syntax Description

rate	Sustainable rate in kilobits per second (kbps) that this SVC can receive low-priority and high-priority cells from the destination router. Default is –1. Maximum upper range is 7,113,539 kbps (limited by 0xffffff cells-per-second).

Default

–1. The router does not request this traffic parameter of the ATM switch. The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on the Cisco 7000 series and Cisco 4500 series routers.

This command defines a traffic parameter for the SVC connection.

The suffix **clp1** applies to the cumulative flow of CLP0 and CLP1 (high-priority and low-priority) cells.

Example

The following example requests the sustainable rate for low-priority and high-priority cells from the destination router to 700 kbps:

```
atm backward-sustainable-cell-rate-clp1 700
```

atm clock internal

To cause the AIP 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 AIP uses the transmit clock signal from the remote connection (the line). The switch provides the clocking.

Command Mode

Interface configuration

Usage Guidelines

This command is meaningless on a 4B/5B PLIM.

Example

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

```
atm clock internal
```

atm exception-queue

To set the exception-queue length, use the **atm exception-queue** interface configuration command. The **no** form of this command restores the default value.

> **atm exception-queue** *number*
> **no atm exception-queue**

Syntax Description

number	Number of entries in the range of 8 to 256. Default is 32 entries.

Default

32 entries

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500.

The exception-queue is used for reporting ATM events, such as CRC errors.

Example

In the following example, the exception-queue is set to 50 entries:

```
atm exception-queue 50
```

atm forward-max-burst-size-clp0

To change the maximum number of high-priority cells going from the source router to the destination router at the burst level on the SVC, use the **atm forward-max-burst-size-clp0** map-class configuration command. The **no** form of this command restores the default value.

atm forward-max-burst-size-clp0 *cell-count*
no atm forward-max-burst-size-clp0

Syntax Description

cell-count   Maximum number of high-priority cells going from the source router at the burst level. Default is -1.

Default

-1. The router does not request this quality of service (QOS) parameter of the ATM switch, so the switch provides a "best effort service." The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

The keyword **clp0** indicates that this command affects only cells with a cell loss priority (CLP) of 0 (high-priority cells).

Example

The following example sets the maximum number of high-priority cells going from the source router at the burst level to 100,000:

```
atm forward-max-burst-size-clp0 100000
```

atm forward-max-burst-size-clp1

To request the maximum number of low-priority and high-priority cells going from the source router to the destination router at the burst level on the SVC, use the **atm forward-max-burst-size-clp1** map-class configuration command. The **no** form of this command restores the default value.

> **atm forward-max-burst-size-clp1** *cell-count*
> **no atm forward-max-burst-size-clp1**

Syntax Description

cell-count	Maximum number of low-priority and high-priority cells going from the source router at the burst level. Default is –1.

Default

–1. The router does not request this traffic parameter of the ATM switch. The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on the Cisco 7000 series and Cisco 4500 series routers.

This command defines a traffic parameter for the SVC connection.

The suffix **clp1** applies to the cumulative flow of CLP0 and CLP1 (high-priority and low-priority) cells.

On the Cisco 7000 series, this parameter can be between 32 and 2106 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 series, this parameter can be between 1 and 65535 cells.

Example

The following example requests the maximum number of low-priority and high-priority cells going from the source router at the burst level to 100,000:

```
atm forward-max-burst-size-clp1 100000
```

atm forward-peak-cell-rate-clp0

To change the peak rate of high-priority cells going from the source router to the destination router on the SVC, use the **atm forward-peak-cell-rate-clp0** map-class configuration command. The **no** form of this command restores the default value.

atm forward-peak-cell-rate-clp0 *rate*
no atm forward-peak-cell-rate-clp0

Syntax Description

rate	Maximum rate in kilobits per second (kbps) that this SVC can send high-priority cells from the source router. Default is -1. Maximum upper range is 155,000 kbps.

Default

-1. The router does not request this quality of service (QOS) parameter of the ATM switch, so the switch provides a "best effort service." The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

The keyword **clp0** indicates that this command affects only cells with a cell loss priority (CLP) of 0 (high-priority cells).

Example

The following example sets the peak high-priority cell rate from the source router to 1000 Kbps:

```
atm forward-peak-cell-rate-clp0 1000
```

atm forward-peak-cell-rate-clp1

To request the peak rate of low-priority and high-priority cells coming from the source router to the destination router on the SVC, use the **atm forward-peak-cell-rate-clp1** map-class configuration command. The **no** form of this command restores the default value.

atm forward-peak-cell-rate-clp1 *rate*
no atm forward-peak-cell-rate-clp1

Syntax Description

rate	Maximum rate in kilobits per second (kbps) that this SVC can send low-priority and high-priority cells from the source router. Default is –1. Maximum upper range is 7,113,539 kbps (limited by 0xffffff cells-per-second).

Default

–1. The router does not request this traffic parameter of the ATM switch. The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on the Cisco 7000 series and Cisco 4500 series routers.

This command defines a traffic parameter for the SVC connection.

The suffix **clp1** applies to the cumulative flow of CLP0 and CLP1 (high-priority and low-priority) cells.

On the Cisco 7000 series, this parameter can be between 32 and 2106 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 series, this parameter can be between 1 and 65535 cells.

Example

The following example requests the peak low-priority and high-priority cell rate from the source router to 100,000 kbps:

```
atm forward-peak-cell-rate-clp1 100000
```

atm forward-sustainable-cell-rate-clp0

To change the sustainable rate of high-priority cells coming from the source router to the destination router on the SVC, use the **atm forward-sustainable-cell-rate-clp0** map-class configuration command. The **no** form of this command restores the default value.

atm forward-sustainable-cell-rate-clp0 *rate*
no atm forward-sustainable-cell-rate-clp0

Syntax Description

rate   Sustainable rate in kilobits per second (kbps) that this SVC can send high-priority cells from the source router. Default is -1. Maximum upper range is 155,000 kbps.

Default

-1. The router does not request this quality of service (QOS) parameter of the ATM switch, so the switch provides a "best effort service." The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

The keyword **clp0** indicates that this command affects only cells with a cell loss priority (CLP) of 0 (high-priority cells).

Example

The following example sets the sustainable rate for high-priority cells from the source router to 100,000 kbps:

```
atm forward-sustainable-cell-rate-clp0 100000
```

atm forward-sustainable-cell-rate-clp1

To request the sustainable rate of low-priority and high-priority cells coming from the source router to the destination router on the SVC, use the **atm forward-sustainable-cell-rate-clp1** map-class configuration command. The **no** form of this command restores the default value.

> **atm forward-sustainable-cell-rate-clp1** *rate*
> **no atm forward-sustainable-cell-rate-clp1**

Syntax Description

rate	Sustainable rate in kilobits per second (kbps) that this SVC can send low-priority and high-priority cells from the source router. Default is –1. Maximum upper range is 7,113,539 kbps (limited by 0xffffff cells-per-second).

Default

–1. The router does not request this traffic parameter of the ATM switch. The switch will drop cells if there is not enough buffer space.

Command Mode

Map-class configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on the Cisco 7000 series and Cisco 4500 series routers.

This command defines a traffic parameter for the SVC connection.

The suffix **clp1** applies to the cumulative flow of CLP0 and CLP1 (high-priority and low-priority) cells.

Example

The following example requests the sustainable rate for low-priority and high-priority cells from the source router to100,000 kbps:

```
atm forward-sustainable-cell-rate-clp1 100000
```

atm maxvc

To set the ceiling value of the virtual circuit descriptor (VCD) on the AIP card, use the **atm maxvc** interface configuration command. The **no** form of this command restores the default value.

atm maxvc *number*
no atm maxvc

Syntax Description

number	Maximum number of supported virtual circuits. Valid values are 256, 512, 1024, 2048, or 4096. Default is 4096.

Default

4096 virtual circuits

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500.

This command sets the maximum value supported for the *vcd* argument in the **atm pvc** command. It also determines the maximum number of virtual circuits on which the AIP allows segmentation and reassembly (SAR) to occur.

However, if you set a **maxvc** limit and then enter the **atm pvc** command with a larger value for the *vcd* argument, the software does not generate an error message.

This command does not affect the VPI/VCI of each virtual circuit.

Example

The following example sets a ceiling VCD value of 2048 and restricts the AIP to supporting at most 2048 virtual circuits:

```
atm maxvc 2048
```

atm mid-per-vc

To limit the number of message identifier (MID) numbers allowed on each virtual circuit, use the **atm mid-per-vc** interface configuration command.

atm mid-per-vc *maximum*

Syntax Description

maximum	Number of MIDs allowed per virtual circuit on this interface. The values allowed are 16, 32, 64, 128, 256, 512, and 1024. The default is 16 MIDs per virtual circuit.

Default

The default limit is 16 MIDs per virtual circuit.

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500.

Message identifier (MID) numbers are used by receiving devices to reassemble cells from multiple sources into packets.

This command limits the number of discrete messages allowed on the PVC at the same time. It does not limit the number of cells associated with each message.

The *maximum* set by the **atm mid-per-vc** command overrides the range between the *midhigh* and *midlow* values set by the **atm pvc** command. If you set a *maximum* of 16 but a *midlow* of 0 and a *midhigh* of 255, only 16 MIDs (not 256) will be allowed on the virtual circuit.

Example

The following example allows 64 MIDs per ATM virtual circuit:

```
atm mid-per-vc 64
```

Related Command

atm pvc

atm multicast

To assign an SMDS E.164 multicast address to the ATM subinterface that supports AAL3/4 and SMDS encapsulation, use the **atm multicast** interface configuration command.

   atm multicast *address*

Syntax Description

address	Multicast E.164 address assigned to the subinterface.

Default

No multicast E.164 address is defined.

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500. The Cisco 4500 does not support AAL3/4.

Each AAL3/4 subinterface is allowed only one multicast E.164 address. This multicast address is used for all protocol broadcast operations.

Example

The following example assigns a multicast E.164 address to the ATM subinterface that is being configured:

```
atm multicast e180.0999.000
```

Related Commands

atm aal aal3/4
atm pvc
atm smds
interface atm

atm nsap-address

To set the NSAP address for an ATM interface using SVC mode, use the **atm nsap-address** interface configuration command. The **no** form of this command removes any configured address for the interface.

> **atm nsap-address** *nsap-address*
> **no atm nsap-address**

Syntax Description

nsap-address   The 40-digit (hexadecimal) NSAP address of this interface (the source address).

Default

No NSAP address is defined for this interface.

Command Mode

Interface configuration

Usage Guidelines

When you are configuring an SVC, the **atm nsap-address** command is required, as it defines the source NSAP address. It identifies a particular port on the ATM network and must be unique across the network.

Configuring a new address on the interface will overwrite the previous address. The router considers the address as a string of bytes and will not prefix or suffix the address with any other strings or digits. The complete NSAP address must be specified, because this value will be used in the Calling Party Address Information Element in the SETUP message to establish a virtual circuit.

ATM NSAP addresses have a fixed length of 40 hexadecimal digits. You must configure the complete address in the following dotted format:

XX.XXXX.XX.XXXXXX.XXXX.XXXX.XXXX.XXXX.XXXX.XXXX.XX

Note   All ATM NSAP addresses must be entered in the dotted hexadecimal format shown above, which conforms to the UNI specification.

Example

In the following example, the source NSAP address for the interface is AB.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12:

```
atm nsap-address AB.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
```

atm pvc

To create a permanent virtual circuit (PVC) on the AIP interface, 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*]]
no atm pvc *vcd vpi vci aal-encap* [[*midlow midhigh*] [*peak average burst*]]

Syntax Description

vcd	Virtual circuit descriptor. A unique number per AIP that identifies to the AIP which VPI/VCI to use for a particular packet. Valid values range from 1 to the value set with the **atm maxvc** command. The AIP requires this feature to manage packet transmission. The vcd is not associated with the VPI/VCI used for the ATM network cells.
vpi	ATM network virtual path identifier (VPI) of this PVC, in the range from 0 through 255. The VPI is an 8-bit field in the header of the ATM cell. The VPI value is unique only on a single interface, 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.
vci	ATM network virtual channel identifier (VCI) of this PVC, in the range of 0 through 65535. The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single interface, 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); not supported on the Cisco 4500
	• **aal5nlpid** (encapsulation that allows ATM interfaces to interoperate with HSSI interfaces that are using an ADSU and running ATM-DXI)
	• **aal5mux decnet** (a MUX-type virtual circuit)
	• **aal5mux ip** (a MUX-type virtual circuit)
	• **aal5mux novell** (a MUX-type virtual circuit)
	• **aal5mux vines** (a MUX-type virtual circuit)
	• **aal5mux xns** (a MUX-type virtual circuit)
	• **aal5snap** (LLC/SNAP precedes the protocol datagram).
	• **qsaal** (a signaling-type PVC used for setting up or tearing down SVCs)
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. 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.
average	(Optional) Average rate (in kbps) at which this virtual circuit will transmit. 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.
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 MTU size of the AIP card. If you set this value, you must also specify a value for the *peak* and *average* arguments.

Default

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.

Command Mode

Interface configuration

Usage Guidelines

The 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 are used by receiving devices to reassemble cells from multiple sources into 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 second example that follows.

Examples

The following example creates a PVC with VPI 0 and VCI 6. The PVC uses AAL aal5mux with IP protocol.

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

The following example creates a PVC with VPI 0 and VCI 6. The PVC uses AAL aal3/4-SMDS protocol.

```
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. It 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

atm rate-queue

To create a permanent rate queue for the AIP, use the **atm rate-queue** interface configuration command. The **no** form of this command removes the rate queue.

> **atm rate-queue** *queue-number speed*
> **no atm rate-queue**

Syntax Description

queue-number Queue number in the range 0 through 7. Queues 0 through 3 are in the high-priority bank and queues 4 through 7 are in the low-priority bank.

speed Speed in megabits per second (Mbps) in the range from 1 through 155. The maximum speed is determined by the detected PLIM type on the AIP:

- 34 Mbps for E3
- 45 Mbps for DS-3 (when available)
- 100 Mbps for TAXI
- 155 Mbps for SONET

Default

No rate-queue is defined.

Command Mode

Interface configuration

Usage Guidelines

If you do not create permanent rate queues or if you create PVCs with peak/average rates that are not matched by the rate queues you configure, the software will dynamically create rate queues as necessary to satisfy the requests of the **atm pvc** commands.

You can create multiple rate queues. A warning message appears if all rate queues are deconfigured or if the combined rate-queues exceed the PLIM rate.

Example

In the following example, rate queue 1 is configured for 100 Mbps:

```
atm rate-queue 1 100
```

Related Command

atm pvc

atm rawq-size

To define the AIP raw-queue size, use the **atm rawq-size** interface configuration command. The **no** form of this command restores the default value.

atm rawq-size *number*
no atm rawq-size

Syntax Description

number	Maximum number of cells in the raw queue simultaneously, in the range 8 through 256. Default is 32.

Default

32 cells

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500.

The raw queue is used for raw ATM cells, which include OAM (F4 and F5) and Interim Local Management Interface (ILMI) cells.

Example

In the following example, a maximum of 48 cells are allowed in the raw queue:

```
atm rawq-size 48
```

atm rxbuff

To set the maximum number of Receive buffers for simultaneous packet reassembly, use the **atm rxbuff** interface configuration command. The **no** form of this command restores the default value.

> **atm rxbuff** *number*
> **no atm rxbuff**

Syntax Description

number	Maximum number of packet reassemblies that the AIP can perform simultaneously, in the range 0 through 512. Default is 256.

Default

256 packet reassemblies

Command Mode

Interface configuration

Example

This command is supported on the Cisco 7000, but not on the Cisco 4500.

In the following example, the AIP can perform a maximum of 300 packet reassemblies simultaneously:

```
atm rxbuff 300
```

atm sig-traffic-shaping strict

To specify that an SVC should be established on an ATM interface only if shaping can be done per the signaled traffic parameters, use the **atm sig-traffic-shaping strict** interface configuration command. To disable strict traffic shaping, use the **no** form of this command.

atm sig-traffic-shaping strict
no atm sig-traffic-shaping

Default

The default value is lenient (not strict) traffic shaping for SVCs.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

This command is supported on the Cisco 7000 series, Cisco 7500 series, Cisco 4500 and Cisco 4700 routers.

If strict traffic-shaping is configured on the router ATM interface, then an SVC is established only if traffic shaping can be provided for the transmit cell flow per the signaled traffic parameters. If such shaping cannot be provided, the SVC is released.

If strict traffic-shaping is not configured on the router ATM interface, an attempt is made to establish an SVC with traffic shaping for the transmit cell flow per the signaled traffic parameters. If such shaping cannot be provided, the SVC is installed with default shaping parameters (behaves as though a PVC were created without specifying traffic parameters).

The signaling SETUP message carries the forward and backward traffic parameters. For connections initiated by the source router, traffic is shaped to the SETUP message forward parameters. For connections initiated by another router/host, traffic is shaped to the backward parameters.

Example

The following example allows an SVC to be established on an ATM interface using only signaled traffic parameters:

```
atm sig-traffic-shaping strict
```

atm smds-address

To assign a unicast E.164 address to the ATM subinterface that supports AAL3/4 and SMDS encapsulation, use the **atm smds-address** interface configuration command.

atm smds-address *address*

Syntax Description

address	Unicast E.164 address assigned to the subinterface.

Default

No E.164 address is assigned.

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500.

Each AAL3/4 subinterface is allowed only one unicast E.164 address.

Example

The following example assigns a unicast E.164 address to the ATM subinterface that is being configured:

```
atm smds-address c141.555.1212
```

Related Commands

atm aal aal3/4
atm multicast
atm pvc
interface atm

atm sonet stm-1

To set the proper mode of operation for the SONET PLIM, use the **atm sonet stm-1** interface configuration command. The **no** form of this command restores the default.

> **atm sonet stm-1**
> **no atm sonet stm-1**

Syntax Description

This command has no arguments or keywords.

Default

STS-3C

Command Mode

Interface configuration

Usage Guidelines

Use STM-1 in applications where the ATM switch requires "unassigned cells" for rate adaptation. Use the default (STS-3C) in applications where the ATM switch requires "idle cells" for rate adaptation.

Example

The following example specifies ATM SONET STM-1:

```
atm sonet stm-1
```

atm txbuff

To set the maximum number of Transmit buffers for simultaneous packet fragmentation, use the **atm txbuff** interface configuration command. The **no** form of this command restores the default value.

atm txbuff *number*
no atm txbuff

Syntax Description

number	Maximum number of packet fragmentations that the AIP can perform simultaneously, in the range 0 through 512. Default is 256.

Default

256 packet fragmentations

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000, but not on the Cisco 4500.

Example

In the following example, the AIP is configured to perform up to 300 packet fragmentations simultaneously:

```
atm txbuff 300
```

atm vc-per-vp

To set the maximum number of VCIs to support per VPI, use the **atm vc-per-vp** interface configuration command. The **no** form of this command restores the default value.

atm vc-per-vp *number*
no atm vc-per-vp

Syntax Description

number	Maximum number of VCIs to support per VPI. On the Cisco 7000 AIP, valid values are 32, 64, 128, 256, 512, 1024, 2048, or 4096. On the Cisco 4500 NPM, valid values are 32, 64, 128, 256, 512, 1024, 2048, 4096, or 8192. Default is 1024.

Default

1024

Command Mode

Interface configuration

Usage Guidelines

This command controls the memory allocation in the AIP to deal with the VCI table. It defines the maximum number of VCIs to support per VPI; it does not bound the VCI numbers.

An invalid VCI causes a warning message to be displayed.

Example

In the following example, the maximum number of VCIs to support per VPI is set to 512:

```
atm vc-per-vp 512
```

Related Command

atm pvc

atm vp-filter

To set the AIP filter register, use the **atm vp-filter** interface configuration command. The **no** form of this command restores the default value.

> **atm vp-filter** *hexvalue*
> **no atm vp-filter**

Syntax Description

hexvalue	Value in hexadecimal format. Default is 0x7B.

Default

0x7B

Command Mode

Interface configuration

Usage Guidelines

This command is supported on the Cisco 7000 AIP, but not on the Cisco 4500 NPM.

This command configures the hexadecimal value used in the VP filter register in the reassembly operation. The VP filter comprises 16 bits. The VP Filter Register uses the most significant bits (bits 15 through 8, the left half of the filter) as mask bits and uses bits 7 through 0 (the right half of the filter) as compare bits. When a cell is received, the right half of the filter is exclusively NORed with the binary value of the incoming VPI. The result is then ORed with the left half of the filter (the mask). If the result is all ones, then reassembly is done using the VCI/MID table (AAL3/4 processing). Otherwise, reassembly is done using the VPI/VCI table (AAL5 processing).

In other words, this command allows a way to specify which VPI (or range of VPIs) will be used for AAL3/4 processing; all other VPIs map to AAL5 processing. If only AAL5 processing is desired, the VP filter can default or be set to an arbitrary VPI and AAL5 processing will be performed on all VPIs.

Examples

In the following example, all incoming cells will be reassembled using AAL3/4 processing:

```
atm vp-filter ff00
```

In the following example, all incoming cells with VP=0 will be reassembled using AAL3/4 processing; all other cells will be reassembled using AAL5 processing:

```
atm vp-filter 0
```

In the following example, all incoming cells with the most significant bit of the VP set will be reassembled using AAL3/4; all other cells will be reassembled using AAL5 processing:

```
atm vp-filter 7f80
```

atm-nsap

To define an ATM map statement for an SVC, use the **atm-nsap** map-list configuration command in conjunction with the **map-list** global configuration command. The **no** form of this command removes the address.

protocol protocol-address **atm-nsap** *atm-nsap-address* [**class** *class-name*] [**broadcast**]
no *protocol protocol-address* **atm-nsap** *atm-nsap-address* [**class** *class-name*] [**broadcast**]

Syntax Description

protocol	One of the following keywords: **appletalk**, **apollo**, **bridge**, **clns**, **decnet**, **ip**, **ipx**, **vines**, **xns**.
protocol-address	Destination address that is being mapped to this SVC.
atm-nsap-address	Destination ATM NSAP address. Must be exactly 40 hexadecimal digits long and in the correct dotted format.
class	(Optional) Keyword.
class-name	(Optional) Name of a table that contains encapsulation-specific parameters. Such a table can be shared between maps that have the same encapsulation.
broadcast	(Optional) Indicates this map entry is to be used when the corresponding *protocol* wants to send broadcast packets to the interface (for example, IGRP updates).

Default

No map statements are defined.

Command Mode

Map-list configuration

Usage Guidelines

This command is required with the **map-list** command when you are configuring an SVC.

Example

In the following example, a map list named atmsvc includes one map statement for a destination address being mapped:

```
map-list atmsvc
ip 131.108.97.17 atm-nsap AB.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12 class qos
broadcast
```

Related Command

map-list

atm-vc

To define an ATM map statement for a PVC, use the **atm-vc** map-list configuration command in conjunction with the **map-list** global configuration command. The **no** form of this command removes the address.

protocol protocol-address **atm-vc** *vcd* [**broadcast**]
no *protocol protocol-address* **atm-vc** *vcd* [**broadcast**]

Syntax Description

protocol	One of the following keywords: **appletalk**, **apollo**, **bridge**, **clns**, **decnet**, **ip**, **ipx**, **vines**, **xns**.
protocol-address	Destination address that is being mapped to this PVC.
vcd	Virtual circuit descriptor of the PVC.
broadcast	(Optional) Indicates that this map entry is to be used when the corresponding *protocol* wants to send broadcast packets to the interface (for example, IGRP updates). Provides pseudo-broadcasting support.

Default

No map statements are defined.

Command Mode

Map-list configuration

Usage Guidelines

When operating in PVC mode, multicast capabilities may not exist in the ATM switch. For this reason, all static maps for a specific protocol should be marked as **broadcast** for multicasting. When a protocol is sending a packet to its multicast address, all static maps marked as **broadcast** will get a copy of that packet. This procedure simulates the multicast environment of a LAN.

Some switches may have point-to-multipoint PVCs that do the equivalent process. If one exists, then that PVC may be used as the sole **broadcast** PVC for all multicast requests.

Example

In the following example, a map list named atm includes two map statements for protocol addresses being mapped:

```
map-list atm
ip 131.108.168.112 atm-vc 1 broadcast
decnet 10.2 atm-vc 2 broadcast
```

Related Command

map-list

atmsig close

To disconnect an SVC, use the **atmsig close** EXEC command.

> **atmsig close atm** *slot***/0** *vcd*

Syntax Description

slot	Slot of the SVC to close.
vcd	Virtual circuit descriptor of the signaling PVC to close.

Command Mode
EXEC

Usage Guidelines
Since the AIP does not perform packet-level accounting on a per-virtual circuit basis, the interface does not close an idle SVC automatically. You must execute this command if you want to close a particular SVC. Since virtual circuits are numbered per interface, you must specify which ATM interface by its slot number.

Example
The following example closes SVC 2 on ATM interface 4/0:

```
atmsig close atm4/0 2
```

dxi map

To map a protocol address to a given VPI and VCI, use the **dxi map** interface configuration command. Use the **no** form of this command to remove the mapping for that protocol and protocol address.

dxi map *protocol protocol-address vpi vci* [**broadcast**]
no dxi map *protocol protocol-address*

Syntax Description

protocol	The bridging or protocol keyword: **apollo**, **appletalk**, **bridge**, **clns**, **decnet**, **ip**, **novell**, **vines**, or **xns**.
protocol-address	Protocol-specific address.
vpi	Virtual path identifier in the range 0 to 15.
vci	Virtual circuit identifier in the range 0 to 63.
broadcast	(Optional) Broadcasts should be forwarded to this address.

Default

No map definition is established.

Command Mode

Interface configuration

Usage Guidelines

This command is used in configurations where the router is intended to communicate with an ATM network through an ATM Data Service Unit (ADSU). Given the circuit identifier parameters (VPI and VCI) for the ATM permanent virtual circuit, the router computes and uses the DXI frame address (DFA) that is used for communication between the router and the ADSU.

The **dxi map** command can be used only on a serial interface or HSSI configured for ATM-DXI encapsulation.

Example

In the following example, all IP packets intended for the host with IP address 131.108.170.49 are converted into ATM cells identified with a VPI of 2 (binary 0000 0010) and a VCI of 46 (binary 0000 0000 0010 1110) by the ADSU.

```
interface serial 0
dxi map ip 131.108.170.49 2 46 broadcast
```

Using the mapping defined in Annex A of the ATM DXI Specification, the router will use the VPI and VCI information in this example to compute a DFA of 558 (binary 1000101110). The ADSU will use DFA of the incoming frame to extract the VPI and VCI information when formulating ATM cells.

Related Commands

A dagger (†) indicates that the command is documented in another chapter.

dxi pvc
encapsulation atm-dxi
interface serial [†]

dxi pvc

Use the **dxi pvc** interface configuration command to configure multiprotocol or single protocol ATM-DXI encapsulation. The **no** form of this command disables multiprotocol ATM-DXI encapsulation.

dxi pvc *vpi vci* [**snap** | **nlpid** | **mux**]
no dxi pvc *vpi vci* [**snap** | **nlpid** | **mux**]

Syntax Description

vpi	ATM network virtual path identifier (VPI) of this PVC, in the range from 0 through 255. The VPI is an 8-bit field in the header of the ATM cell. The VPI value is unique only on a single interface, 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.
vci	ATM network virtual channel identifier (VCI) of this PVC, in the range of 0 through 65535. The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single interface, 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.
snap	(Optional) LLC/SNAP encapsulation based on the protocol used in the packet. This keyword defines a PVC that can carry multiple network protocols. This is the default.
nlpid	(Optional) RFC 1294/1490 encapsulation. This option is provided for backward compatibility with the default encapsulation in earlier versions of the Cisco IOS.
mux	(Optional) MUX encapsulation; the carried protocol is defined by the **dxi map** command when the PVC is set up. This keyword defines a PVC that carries only one network protocol.

Default
LLC/SNAP encapsulation.

Command Mode
Interface configuration

Usage Guidelines
This command can be used only on a serial interface or HSSI that is configured with ATM-DXI encapsulation.

Select the **nlpid** option if software earlier than Release 10.3 was loaded previously on this router and the router was configured for the default encapsulation, which was **nlpid** in pre-10.3 releases.

Examples

The following example configures ATM-DXI MUX encapsulation on serial interface 1. The PVC identified by a VPI of 10 and a VCI of 10 will carry a single protocol. Then the protocol to be carried on this PVC is defined by the **dxi map** command.

```
interface serial 1
dxi pvc 10 10 mux
dxi map ip 131.108.176.45 10 10 broadcast
```

The following example configures ATM-DXI NLPID encapsulation on serial interface 1. The PVC identified by a VPI of 11 and a VCI of 11 can carry multiprotocol traffic that is encapsulated with a header described in RFC 1294/1490.

```
interface serial 0
dxi pvc 11 11 nlpid
```

Related Commands

dxi map
encapsulation atm-dxi
show dxi pvc

loopback plim

To place the AIP into loopback mode, use the **loopback plim** interface configuration command. The **no** form of this command removes the loopback.

> **loopback plim**
> **no loopback plim**

Syntax Description

This command has no arguments or keywords.

Default

Packets go from the AIP to the ATM network.

Command Mode

Interface configuration

Usage Guidelines

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

Example

The following example places the AIP into loopback mode:

```
loopback plim
```

map-class atm

To enter map-class configuration mode to define parameters used to signal a request for an ATM SVC (the SETUP message), use the **map-class atm** global configuration command. The **no** form of this command deletes this class.

> **map-class atm** *class-name*
> **no map-class atm** *class-name*

Syntax Description

class-name	User-assigned name of the traffic parameters table.

Default

No traffic parameters are defined.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

If the ATM map class identified by *class-name* does not already exist, the router creates a new one. In either case, this command specifies the ATM map class to which subsequent ATM commands apply. Configuration of an ATM map class is allowed only if the ATM subsystem is linked.

If parameters are required, it is up to the media-specific routing that uses a static map to ensure that the referenced class exists.

Most parameters specified through an ATM map class are used to dictate the contents of the ATM Traffic Descriptor Information Element (ATD IE) present in a SETUP message used to initiate an SVC (note that this IE was called the User Cell Rate IE in UNI 3.0). These parameters are configured with the following commands:

atm backward-max-burst-size-clp0
atm backward-max-burst-size-clp1
atm backward-peak-cell-rate-clp0
atm backward-peak-cell-rate-clp1
atm backward-sustainable-cell-rate-clp0
atm backward-sustainable-cell-rate-clp1
atm forward-max-burst-size-clp0
atm forward-max-burst-size-clp1
atm forward-peak-cell-rate-clp0
atm forward-peak-cell-rate-clp1
atm forward-sustainable-cell-rate-clp0
atm forward-sustainable-cell-rate-clp1

Note The 1-parameters specify the traffic characteristics of the aggregate of Cell Loss Priority 0 (CLP0) and CLP1 cells; the 0-parameters are CLP0 only.

When possible, Best Effort is signaled. In UNI 3, a Best Effort Indication can be included in the ATD IE only if the contents of the IE consist of forward and backward Peak Cell Rate for CLP 0+1 (and the Best Effort Indication). Therefore, if any of the above commands other than **atm forward-peak-cell-rate-clp1** and **atm backward-peak-cell-rate-clp1** are specified in the map-class, Best Effort cannot be signaled.

It is important that Best Effort is signaled, because this causes a switch to interpret the SETUP as a request for an Unspecified Bit Rate (UBR) connection. UBR requests do not cause bandwidth to be reserved per-connection.

If Best Effort cannot be signaled (one of the other parameters is specified in map-class), then this causes a switch to interpret the SETUP as a request for Non-Real Time Variable Bit Rate (VBR-NRT) service.

All combinations of parameters are allowed in the definition of map-class. The following recommendations can help to specify a correct set of parameters:

- The maximum length of the contents of the ATD IE is 30 bytes. All of the cell-rate and burst parameters require 4 bytes in the IE. Therefore, no more than seven of the 4-byte parameters should be specified.

- The allowable combinations of cell-rate and burst-size parameters from the UNI 3.0 specification are (per direction):

  — peak-cell-rate0, peak-cell-rate0+1

  — peak-cell-rate0+1, sustained-cell-rate0, max-burst0

  — peak-cell-rate0+1

  — peak-cell-rate0+1, sustained-cell-rate0+1, max-burst0+1

- A clp0+1 parameter should be greater than or equal to the clp0 parameter for the same direction.

If default traffic parameters are used in the initiation of an SVC, a Best Effort ATD IE is used. The forward and backward peak-cell-rate0+1 values are 24-bits set to "1" (0xffffff). This is a unique value used to indicate that default shaping parameters can be applied.

Example

The following example establishes traffic parameters for map class *atmclass1*

```
map-list atmlist
ip 172.21.180.121 atm-nsap 12.3456.7890.abcd.0000.00 broadcast class atmclass1
map-class atm atmclass1
atm forward-peak-cell-rate-clp1 8000
atm backward-peak-cell-rate-clp1 8000
interface atm 2/0/0
map-group atmlist
```

Related Commands
show atm map

map-group

To associate an ATM map list to an interface or subinterface for either a PVC or SVC, use the **map-group** interface configuration command. The **no** form of this command removes the reference to the map list.

map-group *name*
no map-group *name*

Syntax Description

name	Name of the map list identified by the **map-list** command.

Default

No ATM map lists are associated.

Command Mode

Interface configuration

Usage Guidelines

More than one map-group can be configured for an interface.

Example

In the following example, the map list named atm is associated with the ATM interface:

```
interface atm 2/0
map-group atm
```

Related Command

map-list

map-list

To define an ATM map statement for either a PVC or SVC, use the **map-list** global configuration command. The **no** form of this command deletes this list and all associated map statements.

map-list *name*
no map-list *name*

Syntax Description

name   Name of the map list.

Default
No map statements are defined.

Command Mode
Global configuration

Usage Guidelines
ATM currently does not provide broadcasting or multicasting capabilities. To allow the router to propagate routing updates and ARP requests, a static map that maps the protocol address and the ATM address of the next-hop ATM station must be configured. The router supports a mapping scheme that identifies the ATM address of remote hosts/routers. This address can be specified either as a virtual circuit descriptor (*vcd*) for a PVC or an NSAP address for an SVC.

The **map-list** command specifies the map list to which the subsequent map-list configuration commands apply. These map-list configuration commands identify destination addresses. One map list can contain multiple map entries. A map-list can be referenced by more than one interface.

Examples
In the following example for a PVC, a map list named atm is followed by two map statements for protocol addresses being mapped:

```
map-list atm
ip 131.108.168.112 atm-vc 1 broadcast
decnet 10.2 atm-vc 2 broadcast
```

In the following example for an SVC, a map list named atm includes two map statements for protocol addresses being mapped:

```
map-list atm
ip 131.108.97.165 atm-nsap BC.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.13
ip 131.108.97.166 atm-nsap BC.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
```

Related Commands
atm-nsap
atm-vc
map-group

show atm interface atm

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

show atm interface atm *slot*/**0**

show atm interface atm *number* (Cisco 4500)

Syntax Description

slot   Slot number of the AIP.

Command Mode

Privileged EXEC

Sample Display

The following is sample output from the **show atm interface atm** command to display statistics on slot 4, port 0:

```
Router# show atm interface atm 4/0

ATM interface ATM4/0:
AAL enabled: AAL5, Maximum VCs: 1024, Current VCs: 6
Tx buffers 256, Rx buffers 256, Exception Queue: 32, Raw Queue: 32
VP Filter: 0x7B, VCIs per VPI: 1024, Max Datagram Size:4496, MIDs/VC:16
PLIM Type:4B5B - 100Mbps, No Framing, TX clocking: LINE
4897 input, 2900 output, 0 IN fast, 0 OUT fast
Rate-Queue 1 set to 100Mbps, reg=0x4EA DYNAMIC, 1 VCCs
ATM4/0.1:AAL3/4-SMDS address c111.1111.1111 Multicast e222.2222.222
Config. is ACTIVE
```

Table 7-1 describes the fields shown in the display.

Table 7-1   Show ATM Interface ATM Field Descriptions

Field	Description
ATM interface	Slot/port number of the interface.
AAL enabled	Type of AAL. If both AAL5 and AAL3/4 are enabled on the interface, the output will include both AAL5 and AAL3/4.
Maximum VCs	Maximum number of virtual circuits this interface can support.
Current VCs	Number of active virtual circuits.
Tx buffers, Rx buffers	Number of buffers configured with the **atm txbuff** or **atm rxbuff** command, respectively.
Exception Queue	Number of buffers configured with the **atm exception-queue** command.
Raw Queue	Queue size configured with the **atm rawq-size** command.
VP Filter	Hexadecimal value of the VP filter as configured by the **atm vp-filter** command.

Field	Description
VCIs per VPI	Maximum number of VCIs to support per VPI, as configured by the **atm vc-per-vp** command.
Max Datagram Size	The configured maximum number of bytes in the largest datagram.
MIDs/VC	The configured maximum number of message identifiers allowed per virtual circuit on this interface.
PLIM Type	Physical Layer Interface Module (PLIM) type (E3, 4B/5B, or SONET).
Framing	For E3, this might be G.804; otherwise, no framing.
TX clocking	Clocking on the router. For E3 or SONET, this might be INTERNAL, meaning the AIP generates the clock. Otherwise, LINE indicates that the ATM switch provides the clocking.
input	Number of packets received and process switched.
output	Number of packets sent from process switch.
IN fast	Number of input packets fast-switched.
OUT fast	Number of output packets fast-switched.
Rate-Queue	List of configured rate queues.
reg=	Actual register value passed to the AIP to define a specific rate queue.
DYNAMIC	Indicates that the rate queue is dynamic and was created automatically by the software. Dynamic rate queues are created when an **atm pvc** command specifies a peak/average rate that does not match any user configured rate queue. The value PERMANENT indicates that the rate queue was user-configured.
VCCs	Number of virtual channel connections (VCCs) dynamically attached to this rate queue.
ATM4/0.1	Indicates that the subinterface supports ATM adaptation layer AAL3/4 and displays the SMDS E.164 unicast address and the SMDS E.164 multicast address assigned to the subinterface.
Config. is	ACTIVE or VALID in *n* SECONDS. ACTIVE indicates that the current AIP configuration has been loaded into the AIP and is being used. There is a 5-second window when a user changes a configuration and the configuration is sent to the AIP.

Related Command
atm pvc

show atm map

To display the list of all configured ATM static maps to remote hosts on an ATM network, use the **show atm map** privileged EXEC command.

> **show atm map**

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Sample Display

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

```
Router# show atm map
Map list atm :

vines 3004B310:0001 maps to VC 4, broadcast
ip 131.108.168.110 maps to VC 1, broadcast
clns 47.0004.0001.0000.0c00.6e26.00 maps to VC 6, broadcast
appletalk 10.1 maps to VC 7, broadcast
decnet 10.1 maps to VC 2, broadcast
```

Table 7-2 describes the fields shown in the display.

Table 7-2   Show ATM Map Field Descriptions

Field	Description
Map list	Name of map list.
protocol address maps to VC *x*	Name of protocol, the protocol address, and the VCD that the address is mapped to.
broadcast	Indicates pseudo broadcasting.

Related Commands

atm pvc
map-list

show atm traffic

To display current, global ATM traffic information to and from all ATM networks connected to the router, use the **show atm traffic** privileged EXEC command.

> **show atm traffic**

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Sample Display

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

```
Router# show atm traffic

4915 Input packets
0 Output packets
2913 Broadcast packets
0 Packets for non-existent VC
```

Table 7-3 describes the fields shown in the display.

Table 7-3   Show ATM Traffic Field Descriptions

Field	Description
Input packets	Total packets input.
Output packets	Total packets output (non-broadcast).
Broadcast packets	Total broadcast packets output.
Packets for non-existent VC	Packets sent to virtual circuits not configured.

Related Command

atm pvc

show atm vc

To display all active ATM virtual circuits (PVCs and SVCs) and traffic information, use the **show atm vc** privileged EXEC command.

show atm vc [*vcd*]

Syntax Description

vcd   (Optional) Specifies which virtual circuit to display information about.

Command Mode

Privileged EXEC

Usage Guidelines

If no *vcd* is specified, the command displays information for all PVCs and SVCs. The output is in summary form (one line per virtual circuit).

Sample Displays

The following is sample output from the **show atm vc** command when no *vcd* is specified, displaying statistics for all virtual circuits:

```
Router# show atm vc

Intfc.    VCD  VPI  VCI  Type  AAL/Encaps   Peak  Avg.  Burst
ATM4/0.1  1    1    1    PVC   AAL3/4-SMDS  0     0     0
ATM4/0    2    2    2    PVC   AAL5-SNAP    0     0     0
ATM4/0    3    3    3    PVC   AAL5-SNAP    0     0     0
ATM4/0    4    4    4    PVC   AAL5-MUX     0     0     0
ATM4/0    6    6    6    PVC   AAL5-SNAP    0     0     0
ATM4/0    7    7    7    PVC   AAL5-SNAP    0     0     0
```

The following is sample output from the **show atm vc** command when a *vcd is* specified, displaying statistics for that virtual circuit only:

```
Router# show atm vc 8

ATM4/0: VCD: 8, VPI: 8, VCI: 8, etype:0x0, AAL5 - LLC/SNAP, Flags: 0x30
PeakRate: 0, Average Rate: 0, Burst: 0 *32cells, VCmode: 0xE000
InPkts: 181061, OutPkts: 570499, InBytes: 757314267, OutBytes: 2137187609
InPRoc: 181011, OutPRoc: 10, Broadcasts: 570459
InFast: 39, OutFast: 36, InAS: 11, OutAS: 6
```

The following is sample output from the **show atm vc** command when a *vcd* is specified, AAL3/4 is enabled, an ATM SMDS subinterface has been defined, and a range of message identifier numbers (MIDs) has been assigned to the PVC:

```
Router# show atm vc 1

ATM4/0.1: VCD: 1, VPI: 0, VCI: 1, etype:0x1, AAL3/4 - SMDS, Flags: 0x35
PeakRate: 0, Average Rate: 0, Burst: 0 *32cells, VCmode: 0xE200
MID start: 1, MID end: 16
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
```

Table 7-4 describes the fields shown in the displays.

Table 7-4   Show ATM VC Field Descriptions

Field	Description
Intfc.	Interface slot/port.
VCD	Virtual circuit descriptor (virtual circuit number).
VPI	Virtual path identifier.
VCI	Virtual channel identifier.
Type	Type of virtual circuit, either PVC or SVC.
AAL/Encaps	Type of ATM adaptation layer (AAL) and encapsulation.
etype	Ether type.
Flags	Bit mask describing virtual circuit information. The flag values are summed to result in the displayed value.
	0x40 SVC
	0x20 PVC
	0x10 ACTIVE
	0x1 AAL5SNAP
	0x2 AAL5NLPID
	0x3 AAL5FRNLPID
	0x4 AAL5MUX
	0x5 AAL3/4-SMDS
	0x6 QSAAL
PeakRate	Number of packets transmitted at the peak rate.
Average Rate	Number of packets transmitted at the average rate.
Burst	Value that, when multiplied by 32, equals the maximum number of ATM cells the virtual circuit can transmit at the peak rate of the virtual circuit.
Vcmode	AIP-specific register describing the usage of the virtual circuit. Contains values such as rate queue, peak rate, and AAL mode, which are also displayed in other fields.
InPkts	Total number of packets received on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-switched, and process-switched packets.
OutPkts	Total number of packets sent on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-switched, and process-switched packets.
InBytes	Total number of bytes received on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-switched, and process-switched bytes.
OutBytes	Total number of bytes sent on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-switched, and process-switched bytes.
InPRoc	Number of process-switched input packets.
OutPRoc	Number of process-switched output packets.
Broadcast	Number of process-switched broadcast packets.

Field	Description
InFast	Number of fast-switched input packets.
OutFast	Number of fast-switched output packets.
InAS	Number of autonomous-switched or silicon-switched input packets.
OutAS	Number of autonomous-switched or silicon-switched output packets.

Related Command

atm pvc

show dxi map

To display all the protocol addresses mapped to a serial interface, use the **show dxi map** EXEC command.

   show dxi map

Command Mode

EXEC

Sample Display

The following is sample output from the **show dxi map** command. It displays output for several previously defined ATM-DXI maps that defined Apollo, IP, DECnet, CLNS, and AppleTalk protocol addresses, various encapsulations, and broadcast traffic.

```
Router# show dxi map

Serial0 (administratively down): ipx 123.0000.1234.1234
   DFA 69(0x45,0x1050), static, vpi = 4, vci = 5,
   encapsulation: SNAP
Serial0 (administratively down): appletalk 2000.5
   DFA 52(0x34,0xC40), static, vpi = 3, vci = 4,
   encapsulation: NLPID
Serial0 (administratively down): ip 131.108.177.1
   DFA 35(0x23,0x830), static,
   broadcast, vpi = 2, vci = 3,
   encapsulation: VC based MUX,
   Linktype IP
```

Table 7-5 explains significant fields shown in the display.

Table 7-5　　**Show DXI Map Field Descriptions**

Field	Description
DFA	DXI Frame Address, similar to a DLCI for Frame Relay. The DFA is shown in decimal, hexadecimal, and in DXI header format. The router computes this address value from the VPI and VCI values.
encapsulation:	Encapsulation type selected by the **dxi pvc** command. Displayed values can be SNAP, NLPID, or VC based MUX.
Linktype	Value used only with MUX encapsulation and therefore with only a single network protocol defined for the PVC. Maps configured on a PVC with MUX encapsulation must have the same link type.

show dxi pvc

To display the PVC statistics for a serial interface, use the **show dxi pvc** EXEC command.

show dxi pvc

Command Mode
EXEC

Sample Display
The following is sample output from the **show dxi pvc** command. It displays output for ATM-DXI
PVCs previously defined for serial interface 0.

```
Router# show dxi pvc

PVC Statistics for interface Serial0 (ATM DXI)

DFA = 17, VPI = 1, VCI = 1, PVC STATUS = STATIC, INTERFACE = Serial0

  input pkts 0          output pkts 0          in bytes 0
  out bytes 0           dropped pkts 0

DFA = 34, VPI = 2, VCI = 2, PVC STATUS = STATIC, INTERFACE = Serial0

  input pkts 0          output pkts 0          in bytes 0
  out bytes 0           dropped pkts 0

DFA = 35, VPI = 2, VCI = 3, PVC STATUS = STATIC, INTERFACE = Serial0

  input pkts 0          output pkts 0          in bytes 0
  out bytes 0           dropped pkts 0
```

Table 7-6 describes significant fields shown in the display.

Table 7-6   Show DXI PVC Field Descriptions

Field	Description
DFA	DXI Frame Address, similar to a DLCI for Frame Relay. The DFA is shown in decimal, hexadecimal, and in DXI header format. The router computes this address value from the VPI and VCI values.
PVC STATUS = STATIC	Only static maps are supported. Maps are not created dynamically.
input pkts	Number of packets received.
output pkts	Number of packets transmitted.
in bytes	Number of bytes in all packets received.
out bytes	Number of bytes in all packets transmitted.
dropped pkts	Should display a zero (0) value. A nonzero value indicates a configuration problem, specifically that a PVC does not exist.

show sscop

To show SSCOP details for all ATM interfaces, use the **show sscop** privileged EXEC command.

> **show sscop**

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Sample Display

The following is sample output from the **show sscop** command:

```
Router# show sscop
SSCOP details for interface ATM4/0
   Current State = Data Transfer Ready
   Send Sequence Number: Current = 2,  Maximum = 9
   Send Sequence Number Acked = 3
   Rcv Sequence Number: Lower Edge = 2, Upper Edge = 2, Max = 9
   Poll Sequence Number = 1876, Poll Ack Sequence Number = 2
   Vt(Pd) = 0
   Connection Control:  timer = 1000
   Timer currently Inactive
   Keep Alive Timer = 30000
   Current Retry Count = 0, Maximum Retry Count = 10
      Statistics -
      Pdu's Sent = 0, Pdu's Received = 0, Pdu's Ignored = 0
      Begin = 0/1, Begin Ack = 1/0, Begin Reject = 0/0
      End = 0/0, End Ack = 0/0
      Resync = 0/0, Resync Ack = 0/0
      Sequenced Data = 2/0, Sequenced Poll Data = 0/0
      Poll = 1591/1876, Stat = 0/1591, Unsolicited Stat = 0/0
      Unassured Data = 0/0, Mgmt Data = 0/0, Unknown Pdu's = 0
```

Table 7-7 describes the fields shown in the display. Interpreting this output requires a good understanding of the SSCOP; it is usually displayed by our technicians to help diagnose network problems.

Table 7-7   Show SSCOP Field Descriptions

Field	Description
SSCOP details for interface	Interface slot and port.
Current State	SSCOP state for the interface.
Send Sequence Number	Current and maximum send sequence number.
Send Sequence Number Acked	Sequence number of packets already acknowledged.
Rcv Sequence Number	Sequence number of packets received.
Poll Sequence Number	Current poll sequence number.
Poll Ack Sequence Number	Poll sequence number already acknowledged.

Field	Description
Vt(Pd)	Number of Sd frames sent which triggers a sending of a Poll frame.
Connection Control	Timer used for establishing and terminating SSCOP.
Keep Alive Timer	Timer used to send keepalives on an idle link.
Current Retry Count	Current count of the retry counter.
Maximum Retry Count	Maximum value the retry counter can take.
Pdu's Sent	Total number of SSCOP frames sent.
Pdu's Received	Total number of SSCOP frames received.
Pdu's Ignored	Number of invalid SSCOP frames ignored.
Begin	Number of Begin frames sent/received.
Begin Ack	Number of Begin Ack frames sent/received.
Begin Reject	Number of Begin Reject frames sent/received.
End	Number of End frames sent/received.
End Ack	Number of End Ack frames sent/received.
Resync	Number of Resync frames sent/received.
Resync Ack	Number of Resync Ack frames sent/received.
Sequenced Data	Number of Sequenced Data frames sent/received.
Sequenced Poll Data	Number of Sequenced Poll Data frames sent/received.
Poll	Number of Poll frames sent/received.
Stat	Number of Stat frames sent/received.
Unsolicited Stat	Number of Unsolicited Stat frames sent/received.
Unassured Data	Number of Unassured Data frames sent/received.
Mgmt Data	Number of Mgmt Data frames sent/received.
Unknown Pdu's	Number of Unknown Pdu's frames sent/received.

sscop cc-timer

To change the connection control timer, use the **sscop cc-timer** interface configuration command. The **no** form of this command restores the default value.

>**sscop cc-timer** *seconds*
>**no sscop cc-timer**

Syntax Description

seconds   Number of seconds between Begin messages. Default is 10 seconds.

Default

10 seconds

Command Mode

Interface configuration

Usage Guidelines

The connection control timer determines the time between transmission of BGN, END, or RS PDUs as long as an acknowledgment has not been received.

Example

In the following example, the connection control timer is set to 15 seconds:

```
sscop cc-timer 15
```

Related Command

sscop max-cc

sscop keepalive-timer

To change the keepalive timer, use the **sscop keepalive-timer** interface configuration command. The **no** form of this command restores the default value.

sscop keepalive-timer *seconds*
no sscop keepalive-timer *seconds*

Syntax Description

seconds   Number of seconds the router waits between transmission of POLL PDUs when no SD or SDP PDUs are queued for transmission or are outstanding pending acknowledgments.

Default

30 seconds

Command Mode

Interface configuration

Example

In the following example, the keepalive timer is set to 15 seconds:

```
sscop keepalive-timer 15
```

sscop max-cc

To change the retry count of connection control, use the **sscop max-cc** interface configuration command. The **no** form of this command restores the default value.

sscop max-cc *retries*
no sscop max-cc

Syntax Description

retries	Number of times that SSCOP will retry to transmit BGN, END, or RS PDUs as long as an acknowledgment has not been received. Valid range is 1 to 6000.

Default

10 retries

Command Mode

Interface configuration

Example

In the following example, the retry count of the connection control is set to 20:

```
sscop max-cc 20
```

Related Command

sscop cc-timer

sscop poll-timer

To change the poll timer, use the **sscop poll-timer** interface configuration command. The **no** form of this command restores the default value.

> **sscop poll-timer** *seconds*
> **no sscop poll-timer**

Syntax Description

seconds	Number of seconds the router waits between transmission of POLL PDUs.

Default

10 seconds

Command Mode

Interface configuration

Usage Guidelines

The poll timer controls the maximum time between transmission of POLL PDUs when SD or SDP PDUs are queued for transmission or are outstanding pending acknowledgments.

Example

In the following example, the poll timer is set to 15 seconds:

```
sscop poll-timer 15
```

sscop rcv-window

To change the receiver window, use the **sscop rcv-window** interface configuration command. The **no** form of this command restores the default value.

> **sscop rcv-window** *packets*
> **no sscop rcv-window**

Syntax Description

packets	Number of packets the interface can receive before it must send an acknowledgment to the ATM switch. Valid range is 1 to 6000.

Default

7 packets

Command Mode

Interface configuration

Example

In the following example, the receiver's window is set to 10 packets:

```
sscop rcv-window 10
```

sscop send-window

To change the transmitter window, use the **sscop send-window** interface configuration command. The **no** form of this command restores the default value.

> **sscop send-window** *packets*
> **no sscop send-window**

Syntax Description

packets	Number of packets the interface can send before it must receive an acknowledgment from the ATM switch. Valid range is 1 to 6000.

Default

7 packets

Command Mode

Interface configuration

Example

In the following example, the transmitter's window is set to 10 packets:

```
sscop send-window 10
```