

ATM Commands

This chapter describes the commands available to configure Asynchronous Transfer Mode (ATM) interfaces on the following:

- Cisco 7200 series routers with ATM port adapter
- Cisco 7500 series routers with AIP or ATM port adapter
- Cisco 4500 and Cisco 4700 routers with Network Processor Module (NPM)

This chapter also describes the commands available to configure a serial interface for ATM access in other routers.

Note ATM is currently not supported on Cisco 2500 series, Cisco AS5100, and Cisco AS5200 access servers. In Cisco IOS Release 11.3, all commands supported on the Cisco 7500 series routers are also supported on the Cisco 7000 series routers equipped with RSP7000.

For ATM configuration information and examples, refer to the ATM chapters in the *Wide-Area Networking 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. To disable support for ATM adaptation layer 3/4 (AAL3/4) on an ATM interface, use the **no** form of this command.

atm aal aal3/4
no 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 first appeared in Cisco IOS Release 10.3.

This command is supported on Cisco 7500 series routers with AIP. This command is not supported on the ATM port adapter. Because Cisco 4500 and Cisco 4700 routers always support both AAL3/4 and AAL5, this command is not required on Cisco 4500 and Cisco 4700 routers.

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 172.21.177.178 255.255.255.0
 atm aal aal3/4
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

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

atm address-registration

To enable the router to engage in address registration and callback functions with the Interim Local Management Interface (ILMI), use the **atm address-registration** interface configuration command. To disable ILMI address registration functions, use the **no** form of this command.

atm address-registration
no atm address-registration

Syntax Description

This command has no keywords and arguments.

Default

Enabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

This command enables a router to register its address with the ILMI for callback when specific events occur, such as incoming Simple Network Management Protocol (SNMP) traps or incoming new network prefixes.

Example

The following example enables ATM interface I/O to register its address:

```
interface atm 1/0
 atm address-registration
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm ilmi-keepalive

atm arp-server

To identify an ATM Address Resolution Protocol (ARP) server for the IP network or set time-to-live (TTL) values for entries in the ATM ARP table, use the **atm arp-server** interface configuration command. To remove the definition of an ATM ARP server, use the **no** form of this command.

```
atm arp-server [self [time-out minutes] | nsap nsap-address]  
no atm arp-server [self [time-out minutes] | nsap nsap-address]
```

Syntax Description

self	(Optional) Specifies the current router as the ATM ARP server.
time-out <i>minutes</i>	(Optional) Number of minutes a destination entry listed in the ATM ARP server's ARP table will be kept before the server takes any action to verify or time out the entry. The default is 20 minutes.
nsap <i>nsap-address</i>	(Optional) Network service access point (NSAP) address of an ATM ARP server.

Defaults

The ARP server process is disabled. The default timeout value is 20 minutes.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

If an NSAP address is specified, the ARP client on this interface uses the specified host as an ARP server. You can specify multiple ATM ARP servers by repeating the command. If **self** is specified, this interface acts as the ARP server for the logical IP network.

The ATM ARP server takes one of the following actions if a destination listed in the server's ARP table expires:

- If a virtual circuit still exists to that destination, the server sends an Inverse ARP request. If no response arrives, the entry times out.
- If a virtual circuit does not exist to the destination, the entry times out immediately.

This implementation follows RFC 1577, Classical IP over ATM.

Example

The following example configures ATM on an interface and configures the interface to function as the ATM ARP server for the IP subnetwork:

```
interface atm 0/0
  ip address 10.0.0.1.255.0.0.0
  atm nsap-address ac.1533.66.020000.0000.0000.0000.0000.0000.0000.00
  atm rate-queue 1 100
  atm maxvc 1024
  atm pvc 1 0 5 qsaal
  atm arp-server self
```

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

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

This command defines a traffic parameter for the SVC connection.

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

On the Cisco 7500 series, this parameter can be between 32 and 2016 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 and Cisco 4700 routers, this parameter can be between 1 and 65535 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

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

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 7500 series, this parameter can be between 32 and 2016 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 and 4700 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 2016:

```
atm backward-max-burst-size-clp1 2016
```

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) at which this SVC can receive high-priority cells from the destination router. Default is -1. Maximum upper range is 155,000 kbps.

Default

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

This command defines a traffic parameter for the SVC connection.

The suffix **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) at which 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 0xfffff cells-per-second).

Default

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

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 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

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

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

This command defines a traffic parameter for the SVC connection.

The suffix **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

<i>rate</i>	Sustainable rate in kilobits per second (kbps) at which 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 0xfffff cells-per-second).
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Default

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

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 class

To specify a class for an ATM interface, use the **atm class** global configuration command. The **no** form of this command deletes this class from the interface.

```
atm class class-name  
no atm class class-name
```

Syntax Description

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

Default

No class is defined.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

One command is permitted per interface. Entering a second **atm class** command on an interface results in the original entry being overwritten.

Example

The following example illustrates the configuration of an ATM ARP client in an SVC environment using the class *classicip* for traffic shaping:

```
interface atm 2/0  
  atm pvc 1 0 5 qsaal  
  atm pvc 2 0 16 ilmi  
  atm esi-address 345678901234.12  
  ip address 10.0.0.2 255.0.0.0  
  atm arp-server nsap ac.1533.66.020000.0000.0000.0000.0000.0000.00  
  atm class classicip  
  no shutdown  
  
map-class classicip  
  atm forward-peak-cell-rate-clp1 7000  
  atm backward-peak-cell-rate-clp1 7000  
  atm forward-sustainable-cell-rate-clp0 800
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

map-class atm

atm clock internal

To cause the ATM interface 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 ATM interface uses 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 is meaningless on a 4B/5B physical layer interface module (PLIM).

For SONET interfaces, use the **atm clock internal** command to configure an ATM port adapter to supply its internal clock to the line.

Example

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

```
atm clock internal
```

atm ds3-scramble

To enable scrambling of the ATM cell payload for the DS-3 PLIM, use the **atm ds3-scramble** interface configuration command. To disable this functionality, use the **no** form of this command.

atm ds3-scramble
no atm ds3-scramble

Syntax Description

This command has no arguments or keywords.

Default

Disabled.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Example

The following example enables scrambling of the ATM cell payload for the DS-3 PLIM on the ATM interface 2/0:

```
interface atm 2/0
 atm ds3-scramble
```

atm esi-address

To enter the end station ID (ESI) and selector byte fields of the ATM NSAP address, use the **atm esi-address** interface configuration command. The NSAP address prefix is filled in via ILMI from the ATM switch. The **no** form deletes the end station address.

```
atm esi-address esi.selector  
no atm esi-address esi.selector
```

Syntax Description

<i>esi</i>	End station ID field value in hexadecimal; 6 bytes long.
<i>selector</i>	Selector field value in hexadecimal; 1 byte long.

Default

No end station is defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Before Cisco IOS Release 11.1, ATM addresses were configured on the router only by use of the **atm nsap-address** interface configuration command. The complete 20-byte NSAP (40 hexadecimal characters) had to be configured.

The **atm esi-address** command allows you to configure the ATM address by entering the ESI (12 hexadecimal characters) and the selector byte (2 hexadecimal characters). The ATM prefix (26 hexadecimal characters) will be provided by the ATM switch. To get the prefix from the ATM switch, the ILMI permanent virtual circuit (PVC) must be configured on the router and the ATM switch must be able to supply a prefix via ILMI.

Note When ILMI is configured, use the **atm esi-address** command instead of the **atm nsap-address** command. The **atm esi-address** and **atm nsap-address** commands are mutually exclusive. Configuring the router with the **atm esi-address** command negates the **atm nsap-address** setting, and vice versa.

The ILMI PVC must be configured in order to get an NSAP address prefix from the switch.

Example

The following example sets up the ILMI PVC and assigns the ESI and selector field values on the ATM interface 4/0:

```
interface atm 4/0
  atm pvc 2 0 16 ilmi
  atm esi-address 345678901234.12
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm nsap-address

atm pvc ilmi

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 first appeared in Cisco IOS Release 10.0.

This command is supported on AIP for Cisco 7500 series routers. This command is not supported on the ATM port adapter for Cisco 7200 and 7500 series routers, nor is it supported on Cisco 4500 and Cisco 4700 routers.

The exception queue is used for reporting ATM events, such as cycle redundancy check (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

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

This command defines a traffic parameter for the SVC connection.

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

On the Cisco 7500 series, this parameter can be between 32 and 2016 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 and Cisco 4700 routers, this parameter can be between 1 and 65535 cells.

Example

The following example sets the maximum number of high-priority cells going from the source router at the burst level to 2016:

```
atm forward-max-burst-size-clp0 2016
```

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

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

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 7500 series, this parameter can be between 32 and 2016 cells, with values that are not multiples of 32 rounded to the nearest multiple of 32. On the Cisco 4500 and 4700 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 2016:

```
atm forward-max-burst-size-clp1 2016
```

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) at which this SVC can send high-priority cells from the source router. Default is -1. Maximum upper range is 155,000 kbps.

Default

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

This command defines a traffic parameter for the SVC connection.

The suffix **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) at which 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 0xffff cells-per-second).

Default

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

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 peak rate for low-priority and high-priority cells 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) at which this SVC can send high-priority cells from the source router. Default is -1. Maximum upper range is 155,000 kbps.

Default

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

This command defines a traffic parameter for the SVC connection.

The suffix **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) at which 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 0xfffff cells-per-second).

Default

The default is -1. The router does not request this traffic parameter of the ATM switch. The switch drops 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 following:

- Cisco 4500 and Cisco 4700 routers with NPM
- Cisco 7500 series routers with AIP

This command is not supported on the ATM port adapter.

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 to 100,000 kbps:

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

atm framing (DS3)

To specify DS3 line framing on Cisco 4500 and Cisco 4700 routers, use the following form of the **atm framing** interface configuration command. To return to the default C-bit with Physical Layer Convergence Protocol (PLCP) framing, use the **no** form of this command.

```
atm framing [m23adm | cbitplcp | m23plcp]
no atm framing [m23adm | cbitplcp | m23plcp]
```

Syntax Description

m23adm	(Optional) Specifies M-23 ATM direct mapping.
cbitplcp	(Optional) Specifies C-bit with PLCP framing.
m23plcp	(Optional) Specifies M-23 with PLCP framing.

Default

No framing

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

This command is available only on Cisco 4500 and Cisco 4700 routers with DS3 access speeds. This command is not available on the Cisco 7200 and 7500 series routers.

Framing on the interface must match that on the switch for this ATM link.

Example

The following example specifies M-23 ADM framing on a Cisco 4500 or Cisco 4700 router that has been set up with DS3 access to an ATM network:

```
atm framing m32adm
```

atm framing (E3)

To specify E3 line framing, use the **atm framing** interface configuration command. To return to the default G.751 Physical Layer Convergence Protocol (PLCP) framing, use the **no** form of this command.

atm framing g832adm (Cisco 7200 and 7500 series routers)

no atm framing g832adm

atm framing [g832adm | g751adm] (Cisco 4500 and Cisco 4700 routers)

no atm framing [g832adm | g751adm]

Syntax Description

g832adm (Required for Cisco 7200 and 7500 series routers; optional for Cisco 4500 and Cisco 4700 routers) Specifies G.832 ATM Direct Mapping.

g751adm (Optional) Specifies G.751 ATM Direct Mapping.

Default

No framing

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

This command is available on the Cisco 7200 and 7500 series routers, Cisco 4500 routers, and Cisco 4700 routers with E3 access speeds. This command is not available on the Cisco 7500 with DS3 access speeds; that combination supports only one type of line framing. The default framing is described in the ITU-T Recommendation G.751.

Note The ITU-T carries out the functions of the former Consultative Committee for International Telegraph and Telephone (CCITT).

Framing on the interface must match that on the switch for this ATM link.

Example

The following example specifies G.832 ADM framing on a Cisco 7500 router that has been set up with E3 access to an ATM network:

```
atm framing g832adm
```

atm idle-timeout

To change the idle timer for SVCs on an interface that will cause the SVCs to disconnect when inactive for a specified interval, use the **atm idle-timeout** interface configuration command. To return to the default setting, use the **no** form of this command.

atm idle-timeout *seconds*
no atm idle-timeout

Syntax Description

<i>seconds</i>	Number of seconds the SVC can be inactive before disconnecting. Setting <i>seconds</i> to 0 disables idle timeouts.
----------------	---

Default

The default is 300 seconds (5 minutes).

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

To disable idle timeouts entirely, set the value of *seconds* to zero.

Prior to Cisco IOS Release 11.0, idle timeouts were not supported; that is, the prior configuration was equivalent to **atm idle-timeout 0**.

Example

The following example disconnects an SVC after 300 seconds for the ATM interface 1/0:

```
interface atm 1/0
  atm idle-timeout 300
```

atm ilmi-keepalive

To enable Interim Local Management Interface (ILMI) keepalives, use the **atm ilmi-keepalive** interface configuration command. To disable ILMI keepalives, use the **no** form of this command.

atm ilmi-keepalive [*seconds*]
no atm ilmi-keepalive [*seconds*]

Syntax Description

seconds (Optional) Number of seconds between keepalives. The default is 3 seconds. Values less than 3 seconds are rounded to 3 seconds, and there is no upper bound to the range of values.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Example

The following example enables ILMI keepalives for the ATM interface 1/0:

```
interface atm 1/0
  atm address-registration
  atm ilmi-keepalive
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm address-registration

atm maxvc

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

```
atm maxvc number  
no atm maxvc
```

Syntax Description

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

Default

2048 virtual circuits

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on Cisco 7500 series routers; it is not supported on the Cisco 4500 and Cisco 4700 routers, which have a fixed maximum of 1024.

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 virtual path identifier (VPI)-virtual channel identifier (VCI) pair of each virtual circuit.

Example

The following example sets a ceiling VCD value of 1024 and restricts the AIP to supporting no more than 1024 virtual circuits:

```
atm maxvc 1024
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm pvc

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

<i>maximum</i>	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 first appeared in Cisco IOS Release 10.3.

This command is supported on Cisco 7200 and 7500 series routers.

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) are allowed on the virtual circuit.

Example

The following example allows 64 MIDs per ATM virtual circuit:

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm pvc

atm multicast

To assign a Switched Multimegabit Data Service (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 first appeared in Cisco IOS Release 10.3.

This command is supported on Cisco 7500 series, Cisco 4500, and Cisco 4700 routers. This command is not supported on the ATM port adapter.

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

You can use the master indexes or search online to find documentation of related commands.

atm aal aal3/4

atm pvc

atm smds-address

atm multipoint-interval

To specify how often new destinations can be added to multipoint calls to an ATM switch in the network, use the **atm multipoint-interval** interface configuration command. To return to the default interval, use the **no** form of this command.

```
atm multipoint-interval interval  
no atm multipoint-interval interval
```

Syntax Description

<i>interval</i>	Interval length in seconds, in the range between 0 and 4294967. The default is 30 seconds.
-----------------	--

Default

30 seconds

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

This command applies to SVCs only, not to PVCs.

This command has no effect unless ATM multipoint signaling is enabled on the interface.

Example

The following example enables point-to-multipoint signaling on the ATM interface 2/0. It also specifies that new destinations can be added to multipoint calls every 60 seconds:

```
interface atm 2/0  
  atm multipoint-signalling  
  atm multipoint-interval 60
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm multipoint-signalling

atm multipoint-signalling

To enable point-to-multipoint signaling to the ATM switch, use the **atm multipoint-signalling** interface configuration command. To disable point-to-multipoint signaling to the ATM switch, use the **no** form of this command.

atm multipoint-signalling
no atm multipoint-signalling

Syntax Description

This command has no keywords and arguments.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

If multipoint signaling is enabled, the router uses existing static map entries that have the **broadcast** keyword set to establish multipoint calls. One call is established for each logical subnet of each protocol.

All destinations are added to the call. One multicast packet is sent to the ATM switch for each multipoint call. The ATM switch replicates the packet to all destinations.

The **atm multipoint-interval** command determines how often new destinations can be added to a multipoint call.

Example

The following example enables point-to-multipoint signaling on the ATM interface 2/0:

```
interface atm 2/0
  atm multipoint-signalling
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm multipoint-interval

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

<i>protocol</i>	One of the following keywords: appletalk , apollo , bridge , clns , decnet , ip , ipx , vines , xns .
<i>protocol-address</i>	Destination address that is being mapped to this SVC.
<i>atm-nsap-address</i>	Destination ATM NSAP address. Must be exactly 40 hexadecimal digits long and in the correct dotted format.
class 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 <i>protocol</i> sends broadcast packets to the interface—for example, Interior Gateway Routing Protocol (IGRP) updates.

Default

No map statements are defined.

Command Mode

Map-list configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

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 172.21.97.17 atm-nsap AB.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12 class qos
 broadcast
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

map-list

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

This command first appeared in Cisco IOS Release 10.0.

When you are configuring an SVC, you must use the **atm nsap-address** command to define the source NSAP address. It identifies a particular port on the ATM network and must be unique across the network.

Note When ILMI is configured, use the **atm esi-address** command instead of the **atm nsap-address** command. The **atm esi-address** and **atm nsap-address** commands are mutually exclusive. Configuring the router with the **atm esi-address** command negates the **atm nsap-address** setting, and vice versa.

Configuring a new address on the interface overwrites 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 is 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 should be entered in the dotted hexadecimal format shown above, which conforms to the User-Network Interface (UNI) specification. The dotted method provides some validation that the address is a legal value. If you know your address format is correct the dots may be omitted.

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 an ATM interface 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]*]] [**inarp** [*minutes*]] [**oam** [*seconds*]]

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

atm pvc *vcd vpi vci aal5ciscopp* [*peak average [burst]*] [**oam** [*seconds*]] **virtual-template** *number* (used for PPP over ATM only)

no atm pvc *vcd vpi vci aal5ciscopp* [*peak average [burst]*] [**oam** [*seconds*]] **virtual-template** *number* (used for PPP over ATM only)

Syntax Description

<i>vcd</i>	Virtual circuit descriptor. A unique number that identifies to the processor which VPI-VCI pair to use for a particular packet. Valid values range from 1 to the value set with the atm maxvc command. The AIP or ATM port adapter requires this feature to manage packet transmission. The <i>vcd</i> value is not associated with the VPI-VCI pair used for the ATM network cells. The NPM has a hard coded max <i>vcd</i> value of 1023.
<i>vpi</i>	<p>ATM network virtual path identifier (VPI) of this PVC. On the Cisco 7200 and 7500 series routers, this value ranges from 0 to 255; on the Cisco 4500 and Cisco 4700 series, this value ranges from 0 to 1 less than the quotient of 8192 divided by the value set by the atm vc-per-vc command.</p> <p>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.</p> <p>The arguments <i>vpi</i> and <i>vci</i> cannot both be set to 0; if one is 0, the other cannot be 0.</p>
<i>vci</i>	<p>ATM network virtual channel identifier (VCI) of this PVC, in the range of 0 to 1 less than the maximum value set for this interface by the atm vc-per-vc command. Typically, lower values 0 to 31 are reserved for specific traffic (for example, F4 OAM, SVC signaling, ILMI, and so on) and should not be used.</p> <p>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, because it has local significance only.</p> <p>The arguments <i>vpi</i> and <i>vci</i> cannot both be set to 0; if one is 0, the other cannot be 0.</p>

<i>aal-encap</i>	<p>ATM adaptation layer (AAL) and encapsulation type. When the aal5mux keyword is specified, a protocol is required. Possible values are as follows:</p> <ul style="list-style-type: none"> • 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 apollo—A multiplex (MUX)-type virtual circuit. • aal5mux appletalk—A MUX-type virtual circuit. • aal5mux decnet—A MUX-type virtual circuit. • aal5mux ip—A MUX-type virtual circuit. • aal5mux ipx—A MUX-type virtual circuit. • aal5mux vines—A MUX-type virtual circuit. • aal5mux xns—A MUX-type virtual circuit. • aal5ciscopp—Encapsulation for PPP over ATM. • aal5snap—Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) precedes the protocol datagram. <i>This is the only encapsulation supported for Inverse ARP.</i> • ilmi—Used to set up communication with the ILMI; the associated <i>vpi</i> and <i>vci</i> values are ordinarily 0 and 16, respectively. • qsaal—A signaling-type PVC used for setting up or tearing down SVCs; the associated <i>vpi</i> and <i>vci</i> values are ordinarily 0 and 5, respectively.
<i>midlow</i>	<p>(Set for the aal34smds encapsulation only) (Optional) Starting message identifier (MID) number for this PVC. The default is 0. If you set the <i>peak</i> and <i>average</i> (<i>burst</i> is optional) values for aal34smds encapsulation, you must also set the <i>midlow</i> and <i>midhigh</i> values.</p> <p>This option is not available for the ATM port adapter.</p>
<i>midhigh</i>	<p>(Set for the aal34smds encapsulation only) (Optional) Ending MID number for this PVC. The default is 0. If you set the <i>peak</i> and <i>average</i> (<i>burst</i> is optional) values for aal34smds encapsulation, you must also set the <i>midlow</i> and <i>midhigh</i> values.</p> <p>This option is not available for the ATM port adapter.</p>
<i>peak</i>	<p>(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. If you set this value, you must also specify the <i>average</i> (<i>burst</i> is optional) value. If you set the <i>peak</i> and <i>average</i> values for aal34smds encapsulation, you must also set the <i>midlow</i> and <i>midhigh</i> values.</p> <p>This option is not available for the ATM port adapter.</p>

<i>average</i>	(Optional) Average rate (in kbps) at which this virtual circuit transmits. Valid values are platform dependent. If you set this value, you must also specify the <i>peak</i> (<i>burst</i> is optional) value. If you set the <i>peak</i> and <i>average</i> values for aal34smds encapsulation, you must also set the <i>midlow</i> and <i>midhigh</i> values. This option is not available for the ATM port adapter.
<i>burst</i>	(Optional) Value that relates to the maximum number of ATM cells the virtual circuit can transmit to the network at the <i>peak</i> rate of the PVC. On the AIP, the actual burst cells equals <i>burst</i> * 32 cells, thereby allowing for a burst size of 32 cells to 2016 cells. On the ATMZR the value is not multiplied. If you set this value, you must also specify a value for the <i>peak</i> and <i>average</i> values. On the AIP, <i>burst</i> can range from 1 to 63 On the ATMZR, <i>burst</i> can range from 1 to 65535 This option is not available for the ATM port adapter.
inarp <i>minutes</i>	(Set for the aal5snap encapsulation only) (Optional) Specifies how often Inverse ARP datagrams are sent on this virtual circuit. The default value is 15 minutes.
oam <i>seconds</i>	(Optional) Specifies how often to generate an OAM F5 loopback cell from this virtual circuit. The default value is 10 seconds.
virtual-template <i>number</i>	(Required for aal5cisco encapsulation only) Specifies the number used to identify the virtual template.

Defaults

If *peak* and *average* rate values are omitted, the PVC defaults to peak and average rates equal to the link rate. The peak and average rates are then equal. By default, the virtual circuit is configured to run as fast as possible.

The default of both the *midlow* and *midhigh* values 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 omitted, 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

Subinterface configuration for **aal5cisco** encapsulation

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.

Because the ATM port adapters 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 before the **oam** keyword 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 or 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 *peak* or *average* values, you must specify both. If you set the *peak* and *average* values for **aal34smds** encapsulation, you must also specify the *midlow* and *midhigh* values. **aal34smds** encapsulation is not available for the ATM port adapter.

In the 7000 router series family (AIP), the values for *peak* and *average* indicate the bandwidth as seen on the wire.

In the 4500 router series family, (ATMizer), the values for *peak* and *average* indicate the bandwidth of the AAL5 payload (exclusive of padding).

Message identifier (MID) numbers, which are available only with **aal34smds** encapsulation, 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 are unique at the receiving end and, therefore, that messages can be reassembled correctly.

When configuring an SVC, use the **atm pvc** command to configure the PVC that handles the SVC call setup and termination. In this case, specify the **qsaal** encapsulation for the *aal-encap* keyword. See the third example that follows.

The router generates and echoes OAM F5 loopback cells, which verify connectivity. Once 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.

When configuring PPP over ATM, specify the **aal5ciscoapp** encapsulation for the *aal-encap* keyword and specify the virtual template using the **virtual-template** argument. It is possible to implicitly create a virtual template when configuring PPP over ATM. In other words, if the parameters of the virtual template are not explicitly defined before configuring the ATM PVC, the PPP interface will be brought up using default values from the virtual template identified. However, some parameters (such as an IP address) take effect only if they are specified before the PPP interface comes up. Therefore, it is recommended that you explicitly create and configure the virtual template before configuring the ATM PVC, to ensure such parameters take effect. Alternatively, if parameters

are specified after the ATM PVC has already been configured, you should issue a **shutdown** command followed by a **no shutdown** command on the ATM subinterface to restart the interface, causing the newly configured parameters (such as an IP address) to take effect.

For PPP over ATM, the *average* rate value should be set to the line rate available at the remote site, because the remote line rate will have the lowest speed of the connection. For example, if the remote site has a T1 link, set the line rate to 1.536 Mbps. Because the average rate calculation on the ATM PVC includes the cell headers, a line rate value plus 10 or 15 percent may result in better remote line utilization. The *peak* rate value is typically identical to the *average* rate or some suitable multiple thereof (up to 64 times for the Cisco 7500 series and unlimited for the Cisco 4500 and 4700 routers). The *burst* size value depends on the number of cells that can be buffered by receiving ATM switches and is coordinated with the ATM network connection provider. If this value is not specified, the default, which is the equivalent to one maximum length frame on the interface, is used.

Examples

The following example creates a PVC with VPI 0 and VCI 6. The PVC uses AAL AAL5-MUX 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 physical layer interface module (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
```

The following example creates a PVC to be used for PPP over ATM. It specifies VPI 0 and VCI 32. The PVC uses AAL AAL5-CISCOPPP and specifies a virtual template. If the remote site is using a T1 link, the peak and average rates are typically set equal to each other at 1.536 Mbps (1536 kbps) and a burst size of 64 cells is chosen (2 * 32 cells):

```
atm pvc 1 0 32 aalciscopp 1536 1536 2 virtual-template 2
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

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

atm smds-address
mtu

atm rate-queue

To create a permanent rate queue for the AIP or NPM, 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 for the Cisco 7500 series, and in the range 0 through 3 for the Cisco 4500 and Cisco 4700.

Queues 0 through 3 are in the high-priority bank, and queues 4 through 7 are in the low-priority bank. Queues in the same priority bank have the same priority; for example, queues 0 and 3 have the same priority.

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 or NPM:

- 34 Mbps for E3
- 45 Mbps for DS-3
- 100 Mbps for Transparent Asynchronous Transmitter/Receiver Interface (TAXI)
- 155 Mbps for Synchronous Optical Network (SONET)

Default

No rate queue is defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

If you do not create permanent rate queues or if you create PVCs with peak or average rates that are not matched by the rate queues you configure, the software dynamically creates 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 Commands

You can use the master indexes or search online to find documentation of related commands.

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 first appeared in Cisco IOS Release 10.0.

This command is supported on the Cisco 7200 and 7500 series routers, but not on the Cisco 4500 and Cisco 4700 routers.

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

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is supported on AIP for Cisco 7500 series routers. This command is not supported on the ATM port adapter for Cisco 7200 and 7500 series routers, nor is it supported on Cisco 4500 and Cisco 4700 routers.

Example

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

```
atm rxbuff 300
```

atmsig close atm

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

atmsig close atm slot/0 vcd (for the AIP on Cisco 7500 series routers, for the ATM port adapter on Cisco 7200 series routers)

atmsig close atm slot/port-adapter/0 vcd (for the ATM port adapter on Cisco 7500 series routers)

atmsig close atm number vcd (for the NPM on Cisco 4500 and Cisco 4700 routers)

Syntax Description

<i>number</i>	ATM network processor module number for the NPM on Cisco 4500 and Cisco 4700 routers.
<i>port-adapter</i>	ATM port adapter number for the ATM port adapter on the Cisco 7500 series routers.
<i>slot</i>	ATM slot number for the following: <ul style="list-style-type: none">• AIP on Cisco 7500 series routers.• ATM port adapter on Cisco 7200 series routers and Cisco 7500 series routers.
<i>vcd</i>	Virtual circuit descriptor of the signaling SVC to close.

Command Mode

EXEC

Usage Guidelines

The **atmsig close atm slot/0 vcd** command first appeared in Cisco IOS Release 10.3.

The **atmsig close atm number vcd** command first appeared in Cisco IOS Release 11.1

Execute this command if you want to close a particular SVC. Because virtual circuits are numbered per interface, you must specify the ATM interface by its slot number.

Example

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

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

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 7500 series routers, Cisco 4500 routers, and Cisco 4700 routers. This command is not supported on the ATM port adapter.

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 first appeared in Cisco IOS Release 10.3.

This command is supported on Cisco 7500 series routers, Cisco 4500 routers, and Cisco 4700 routers. This command is not supported on the ATM port adapter.

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

You can use the master indexes or search online to find documentation of related commands.

atm aal aal3/4

atm multicast

atm pvc

atm sonet stm-1

To set the mode of operation and thus control type of ATM cell used for cell-rate decoupling on the SONET PLIM, use the **atm sonet** interface configuration command. The **no** form of this command restores the default Synchronous Transport Signal level 3, concatenated (STS-3c) operation.

atm sonet stm-1
no atm sonet stm-1

Syntax Description

stm-1 Synchronous Digital Hierarchy/Synchronous Transport Signal level 1 (SDH/STM-1) operation (ITU-T specification).

Default

STS-3c

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Use STM-1 in applications where the ATM switch requires “idle cells” for rate adaptation. An idle cell contains 31 zeros followed by a one.

Use the default (STS-3c) in applications where the ATM switch requires “unassigned cells” for rate adaptation. An unassigned cell contains 32 zeros.

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 first appeared in Cisco IOS Release 10.0.

This command is supported on AIP for Cisco 7500 series routers. This command is not supported on the ATM port adapter for Cisco 7200 and 7500 series routers, nor is it supported on Cisco 4500 and Cisco 4700 routers.

Example

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

```
atm txbuff 300
```

atm uni-version

To specify the User-Network Interface (UNI) version (3.0 or 3.1) the router should use when ILMI link autodetermination is unsuccessful or ILMI is disabled, use the **atm uni-version** interface configuration command. To restore the default value to 3.0, use the **no** form of this command.

```
atm uni-version version-number  
no atm uni-version version-number
```

Syntax Description

<i>version-number</i>	UNI version selected on an interface. Valid values are 3.0 and 3.1.
-----------------------	---

Default

Version 3.0

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

Normally, when the ILMI link autodetermination is enabled on the interface and is successful, the router accepts the UNI version returned by ILMI. If the ILMI link autodetermination is unsuccessful or ILMI is disabled, the UNI version defaults to 3.0. You can override the default UNI version by using this command to enable UNI 3.1 signaling support. The **no** form of the command sets the UNI version to one returned by ILMI if ILMI is enabled and the link autodetermination process is successful. Otherwise, the UNI version reverts to 3.0.

Example

The following example specifies UNI version 3.1 signaling port on the ATM interface 2/0:

```
interface atm 2/0  
  atm uni-version 3.1
```

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. To remove the address, use the **no** form of this command.

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

Syntax Description

<i>protocol</i>	One of the following keywords: appletalk , apollo , bridge , clns , decnet , ip , ipx , vines , or xns .
<i>protocol-address</i>	Destination address that is being mapped to this PVC.
<i>vcd</i>	Virtual circuit descriptor of the PVC.
broadcast	(Optional) Indicates that this map entry is to be used when the corresponding <i>protocol</i> sends broadcast packets to the interface—for example, IGRP updates. Provides pseudobroadcasting support.

Default

No map statements are defined.

Command Mode

Map-list configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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

Some switches might have point-to-multipoint PVCs that perform the equivalent process. If one exists, then that PVC might 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 172.21.168.112 atm-vc 1 broadcast  
decnet 10.2 atm-vc 2 broadcast
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

map-list

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 AIP for Cisco 7500 series routers, valid values are: 16, 32, 64, 128, 256, 512, or 1024. On the ATM port adapter for Cisco 7200 series and Cisco 7500 series routers, valid values are: 16, 32, 64, 128, 256, 512, 1024, or 2048. On the NPM for Cisco 4500 and Cisco 4700 routers, 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 first appeared in Cisco IOS Release 10.0.

This command controls the memory allocation in the AIP, ATM port adapter, or NPM 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 Commands

You can use the master indexes or search online to find documentation of related commands.

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 first appeared in Cisco IOS Release 10.0.

This command is supported on Cisco 7500 series routers, but not on Cisco 4500 and Cisco 4700 routers. This command is not supported on ATM port adapters.

This command allows you to specify a VPI or range of VPIs to be used for AAL3/4 processing. All other VPIs map to AAL5 processing. If only AAL5 processing is required, you can either let the virtual path filter default or set it to an arbitrary VPI so that AAL5 processing is performed on all VPIs.

This command configures the hexadecimal value used in the virtual path filter register in the reassembly operation. The virtual path filter comprises 16 bits. The virtual path 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 1s, then reassembly is done using the VCI/MID table (AAL3/4 processing). Otherwise, reassembly is done using the VPI-VCI pair table (AAL5 processing).

Examples

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

```
atm vp-filter ff00
```

In the following example, all incoming cells with the virtual path equal to 0 are reassembled using AAL3/4 processing; all other cells are reassembled using AAL5 processing:

```
atm vp-filter 0
```

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

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

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

<i>protocol</i>	One of the following bridging or protocol keywords: apollo , appletalk , bridge , clns , decnet , ip , novell , vines , or xns .
<i>protocol-address</i>	Protocol-specific address.
<i>vpi</i>	Virtual path identifier in the range 0 to 15.
<i>vci</i>	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 first appeared in Cisco IOS Release 10.3.

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 (PVC), 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 172.21.170.49 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 172.21.170.49 2 46 broadcast
```

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dxl pvc

encapsulation atm-dxl

dxi pvc

To configure multiprotocol or single protocol ATM-DXI encapsulation, use the **dxi pvc** interface configuration command. 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

<i>vpi</i>	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, because it has local significance only. Both <i>vpi</i> and <i>vci</i> cannot be specified as 0; if one is 0, the other cannot be 0.
<i>vci</i>	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, because it has local significance only. Both <i>vpi</i> and <i>vci</i> 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 software.
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 first appeared in Cisco IOS Release 10.3.

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 Cisco IOS Release 10.3 was loaded on this router, and the router was configured for the default encapsulation, which was **nlpid** before Release 10.3.

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 can 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 172.21.176.45 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 12 can carry multiprotocol traffic that is encapsulated with a header described in RFC 1294/1490.

```
interface serial 1
  dxi pvc 11 12 nlpid
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dxi map
encapsulation atm-dxi
show dxi pvc

encapsulation atm-dxi

Use the **encapsulation atm-dxi** interface configuration command to enable ATM-DXI encapsulation. The **no** form of this command disables ATM-DXI.

encapsulation atm-dxi
no encapsulation atm-dxi

Syntax Description

This command has no arguments or keywords.

Default

HDLC

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Example

The following example configures ATM-DXI encapsulation on serial interface 1:

```
interface serial 1
 encapsulation atm-dxi
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dxl map

interface atm

To configure an ATM interface type and enter interface configuration mode, use the **interface atm** global configuration command.

- interface atm** *number* (for the NPM on Cisco 4500 and 4700 routers)
- interface atm** *slot/0* (for the AIP on Cisco 7500 series routers; for the ATM port adapter on Cisco 7200 series routers)
- interface atm** *slot/port-adapter/0* (for the ATM port adapter on Cisco 7500 series routers)

To configure a subinterface, use the **interface atm** global configuration command.

- interface atm** *number.subinterface-number* { **multipoint** | **point-to-point** } (for the NPM on Cisco 4500 and 4700 routers)
- interface atm** *slot/0.subinterface-number* { **multipoint** | **point-to-point** } (for the AIP on Cisco 7500 series routers; for the ATM port adapter on Cisco 7200 series routers)
- interface atm** *slot/port-adapter/0.subinterface-number* { **multipoint** | **point-to-point** } (for the ATM port adapter on Cisco 7500 series routers)

Syntax Description

<i>number</i>	On Cisco 4500 and Cisco 4700 routers, specifies the NPM number. The numbers are assigned at the factory at the time of installation or when added to a system, and can be displayed with the show interfaces command.
<i>port-adapter</i>	ATM port adapter number for the ATM port adapter on Cisco 7500 series routers. The value can be 0 or 1.
<i>slot</i>	On the Cisco 7000 series routers with RSP7000 and Cisco 7200 series, specifies the backplane slot number. On the 7000, value can be 0 , 1 , 2 , 3 , or 4 . On the Cisco 7010, value can be 0 , 1 , or 2 . The slots are numbered from left to right. On the Cisco 7505, the slot number can be 0, 1, 2, or 3 from bottom to top. On the Cisco 7507, the slot number can be 0 and 1 (CyBus0) and 4 through 6 (Cybus1), from left to right. On the Cisco 7513, the slot numbers are 0 through 5 (CyBus 0) and 8 through 12 (CyBus 1), from left to right.
<i>.subinterface-number</i>	Subinterface number in the range 1 to 4294967293.
multipoint point-to-point	Specifies a multipoint or point-to-point subinterface. There is no default.

Default

None

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0 for the Cisco 7000 family routers.
This command first appeared in Cisco IOS Release 11.0 for the Cisco 4500 and 4700 routers.

Example

The following example assigns an IP network address and network mask to the ATM interface in slot 1 on port 0 of a Cisco 7500 series router:

```
interface atm 1/0
 ip address 1.1.1.1.255.255.255.0
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

show interfaces atm

loopback

Use the following form of the **loopback** interface configuration command, to place one of the following into to loopback mode:

- OC-3c, DS3, or E3 interfaces on the Cisco 7500 series AIP
- SONET/SDH OC-3 interface on the Cisco 7200 series routers, and on the second-generation Versatile Interface Processor (VIP2) in Cisco 7500 series routers
- OC-3c interfaces on the Cisco 4500 and Cisco 4700 NPM

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

Syntax Description

cell	(Optional) Place the interface into external loopback at cell level.
diagnostic	(Optional) Place the interface into internal loopback at the PLIM.
line	(Optional) Place the interface into external loopback at the line. This is the default.
payload	(Optional) Place the interface into external loopback at the payload 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 is useful for testing because it loops all packets from the ATM interface back to the ATM interface as well as directing the packets to the network.

Example

The following example loops all packets back to the ATM interface:

```
loopback diagnostic
```

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” (0xfffff). 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

You can use the master indexes or search online to find documentation of 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

This command first appeared in Cisco IOS Release 10.0.

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 Commands

You can use the master indexes or search online to find documentation of related commands.

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

This command first appeared in Cisco IOS Release 10.0.

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 and 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 or subinterface.

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 172.21.168.112 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 172.21.97.165 atm-nsap BC.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.13  
ip 172.21.97.166 atm-nsap BC.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm-nsap

atm-vc

map-group

show atm arp-server

The following is sample output from the **show atm arp-server** command when a slot and port are specified on the Cisco 7500:

```
Router# show atm arp-server atm 1/0
```

Note that a '*' next to an IP address indicates an active call

IP Address	TTL	ATM Address
* 4.4.4.2	19:00	ac1533660200000000000000000000000000000000
* 4.4.4.6	19:00	ac1533660600000000000000000000000000000000
* 4.4.4.15	19:14	ac1533661500000000000000000000000000000000

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm arp-server

show atm interface atm

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

show atm interface atm *slot/port* (Cisco 7200 series with ATM port adapter; Cisco 7500 series with AIP)

show atm interface atm *slot/port-adapter/port* (Cisco 7500 series with ATM port adapter)

show atm interface atm *number* (Cisco 4500 and Cisco 4700 routers)

Syntax Description

<i>slot/port</i>	ATM slot number and port number on the following: <ul style="list-style-type: none"> • Cisco 7200 series with ATM port adapter • Cisco 7500 series with AIP
<i>slot/port-adapter/port</i>	ATM slot, port adapter, and port number on the Cisco 7500 series with ATM port adapter
<i>number</i>	NPM number for Cisco 4500 and Cisco 4700 routers.

Command Mode

Privileged EXEC

Usage Guidelines

The **show atm interface atm *slot/port*** command first appeared in Cisco IOS Release 10.0.

The **show atm interface atm *slot/port-adapter/port*** command first appeared in Cisco IOS Release 11.2 P.

The **show atm interface atm *number*** command first appeared in Cisco IOS Release 11.0.

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 1 describes the fields shown in the display.

Table 1 Show ATM Interface ATM Field Descriptions

Field	Description
ATM interface	Slot and 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 (AIP only).
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 (AIP only).
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 or NPM 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 (AIP only).
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 or 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.

Table 1 Show ATM Interface ATM Field Descriptions (Continued)

Field	Description
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 <i>n</i> SECONDS. ACTIVE indicates that the current AIP or NPM 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 Commands

You can use the master indexes or search online to find documentation of related commands.

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

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Sample Displays

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 172.21.168.110 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
```

The following is sample output from the **show atm map** command for a multipoint connection.

```
Router# show atm map
Map list atm_pri : PERMANENT
ip 4.4.4.4 maps to NSAP CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12, broadcast,
aal5mux, multipoint connection up, VC 6
ip 4.4.4.6 maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12, broadcast,
aal5mux, connection up, VC 15, multipoint connection up, VC 6

Map list atm_ipx : PERMANENT
ipx 1004.dddd.dddd.dddd maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12,
broadcast, aal5mux, multipoint connection up, VC 8
ipx 1004.cccc.cccc.cccc maps to NSAP CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12,
broadcast, aal5mux, multipoint connection up, VC 8

Map list atm_apple : PERMANENT
appletalk 62000.5 maps to NSAP CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12,
broadcast, aal5mux, multipoint connection up, VC 4
appletalk 62000.6 maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12,
broadcast, aal5mux, multipoint connection up, VC 4
```

Table 2 describes the fields shown in the display.

Table 2 Show ATM Map Field Descriptions

Field	Description
Map list	Name of map list.
PERMANENT	This map entry was entered from configuration; it was not entered automatically by a process.
<i>protocol address</i> maps to VC <i>x</i> or <i>protocol address</i> maps to NSAP..	Name of protocol, the protocol address, and the VCD or NSAP that the address is mapped to.
broadcast	Indicates pseudobroadcasting.
aal5mux	Indicates the encapsulation used, a multipoint or point-to-point virtual circuit, and the number of the virtual circuit.
multipoint connection up	Indicates that this is a multipoint virtual circuit.
VC 6	Number of the virtual circuit.
connection up	Indicates a point-to-point virtual circuit.

Related Commands

You can use the master indexes or search online to find documentation of 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

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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 3 describes the fields shown in the display.

Table 3 Show ATM Traffic Field Descriptions

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

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 about which to display information.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

If no *vcd* value 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* value 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* value 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* value 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
```

The following is sample output from the **show atm vc** command when generation of OAM F5 loopback cells has been enabled:

```
Router# show atm vc 7
ATM4/0: VCD: 7, VPI: 7, VCI: 7, etype:0x0, AAL5 - LLC/SNAP, Flags: 0x30
PeakRate: 0, Average Rate: 0, Burst: 0 *32cells, VCmode: 0xE000
OAM frequency: 10, InARP DISABLED
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc:0, Broadcast:0
InFast:0, OutFast:0, InAS:0, OutAS:0
OAM F5 cells sent: 1, OAM cells received: 0
```

The following is sample output from the **show atm vc** command for an incoming multipoint virtual circuit:

```
Router# show atm vc 3
ATM2/0: VCD: 3, VPI: 0, VCI: 33, etype:0x809B, AAL5 - MUX, Flags: 0x53
PeakRate: 0, Average Rate: 0, Burst: 0, VCmode: 0xE000
OAM DISABLED, InARP DISABLED
InPkts: 6646, OutPkts: 0, InBytes: 153078, OutBytes: 0
InPRoc: 6646, OutPRoc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
interface = ATM2/0, call remotely initiated, call reference = 18082
vnum = 3, vpi = 0, vci = 33, state = Active
aal5mux vc, multipoint call
Retry count: Current = 0, Max = 10
timer currently inactive, timer value = never
Root Atm Nsap address: DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
```

The following is sample output from the **show atm vc** command for an outgoing multipoint virtual circuit:

```
Router# show atm vc 6
ATM2/0: VCD: 6, VPI: 0, VCI: 35, etype:0x800, AAL5 - MUX, Flags: 0x53
PeakRate: 0, Average Rate: 0, Burst: 0, VCmode: 0xE000
OAM DISABLED, InARP DISABLED
InPkts: 0, OutPkts: 818, InBytes: 0, OutBytes: 37628
InPRoc: 0, OutPRoc: 0, Broadcasts: 818
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
interface = ATM2/0, call locally initiated, call reference = 3
vnum = 6, vpi = 0, vci = 35, state = Active
aal5mux vc, multipoint call
Retry count: Current = 0, Max = 10
timer currently inactive, timer value = never
Leaf Atm Nsap address: DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
Leaf Atm Nsap address: CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
```

The following is sample output from the **show atm vc** command for a PPP-over-ATM connection:

```
Router# show atm vc 1
ATM8/0.1: VCD: 1, VPI: 41, VCI: 41, etype:0x8, AAL5 - CISCOPPP, Flags: 0xC38
PeakRate: 155000, Average Rate: 155000, Burst: 96, VCmode: 0xE000
virtual-access: 1, virtual-template: 1
OAM DISABLED, InARP DISABLED
InPkts: 13, OutPkts: 10, InBytes: 198, OutBytes: 156
InPRoc: 13, OutPRoc: 10, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM F5 cells sent: 0, OAM cells received: 0
```

The following is sample output from the **show atm vc** command for IP multicast virtual circuits. The display shows the leaf count for multipoint VCs opened by the root. VCD 3 is a root of a multipoint VC with three leaf routers. VCD 4 is a leaf of some other router's multipoint VC. VCD 12 is a root of a multipoint VC with only one leaf router.

```
Router# show atm vc

Interface      VCD  VPI  VCI Type      AAL /      Peak  Avg.  Burst
              VCD  VPI  VCI Type      Encapsulation  Kbps  Kbps  Cells Status
ATM0/0         1    0    5   PVC      AAL5-SAAL    155000 155000 96 ACT
ATM0/0         2    0    16  PVC      AAL5-ILMI    155000 155000 96 ACT
ATM0/0         3    0    124 MSVC-3  AAL5-SNAP    155000 155000 96 ACT
ATM0/0         4    0    125 MSVC   AAL5-SNAP    155000 155000 96 ACT
ATM0/0         5    0    126 MSVC   AAL5-SNAP    155000 155000 96 ACT
ATM0/0         6    0    127 MSVC   AAL5-SNAP    155000 155000 96 ACT
ATM0/0         9    0    130 SVC    AAL5-SNAP    155000 155000 96 ACT
ATM0/0        10    0    131 SVC    AAL5-SNAP    155000 155000 96 ACT
ATM0/0        11    0    132 MSVC-3  AAL5-SNAP    155000 155000 96 ACT
ATM0/0        12    0    133 MSVC-1  AAL5-SNAP    155000 155000 96 ACT
ATM0/0        13    0    134 SVC    AAL5-SNAP    155000 155000 96 ACT
ATM0/0        14    0    135 MSVC-2  AAL5-SNAP    155000 155000 96 ACT
ATM0/0        15    0    136 MSVC-2  AAL5-SNAP    155000 155000 96 ACT
```

The following is sample output from the **show atm vc** command for an IP multicast virtual circuit. The display shows the owner of the VC and leafs of the multipoint VC. This VC was opened by IP multicast and the three leaf routers' ATM addresses are included in the display. The VC is associated with IP group address 224.1.1.1.

```
Router# show atm vc 11

ATM0/0: VCD: 11, VPI: 0, VCI: 132, etype:0x0, AAL5 - LLC/SNAP, Flags: 0x650
PeakRate: 155000, Average Rate: 155000, Burst Cells: 96, VCmode: 0xE000
OAM DISABLED, InARP DISABLED
InPkts: 0, OutPkts: 12, InBytes: 0, OutBytes: 496
InProc: 0, OutProc: 0, Broadcasts: 12
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM F5 cells sent: 0, OAM cells received: 0
Status: ACTIVE, TTL: 2, VC owner: IP Multicast (224.1.1.1) <<<
interface = ATM0/0, call locally initiated, call reference = 2
vnum = 11, vpi = 0, vci = 132, state = Active
  aal5snap vc, multipoint call
Retry count: Current = 0, Max = 10
timer currently inactive, timer value = 00:00:00
Leaf Atm Nsap address: 47.0091810000000002BA08E101.444444444444.02 <<<
Leaf Atm Nsap address: 47.0091810000000002BA08E101.333333333333.02 <<<
Leaf Atm Nsap address: 47.0091810000000002BA08E101.222222222222.02 <<<
```

Table 4 describes the fields shown in the displays.

Table 4 Show ATM VC Field Descriptions

Field	Description
Interface	Interface slot and port.
VCD	Virtual circuit descriptor (virtual circuit number).
VPI	Virtual path identifier.
VCI	Virtual channel identifier.

Table 4 Show ATM VC Field Descriptions (Continued)

Field	Description
Type	Type of virtual circuit, either PVC, SVC or MSVC (multipoint SVC). <ul style="list-style-type: none"> MSVC (with no -x) indicates that VCD is a leaf of some other router's multipoint VC. MSVC-x indicates there are x leaf routers for that multipoint VC opened by the root.
AAL/Encapsulation	Type of ATM adaptation layer (AAL) and encapsulation.
etype	Ethernet type.
Flags	Bit mask describing virtual circuit information. The flag values are summed to result in the displayed value. <p>0x40—SVC</p> <p>0x20—PVC</p> <p>0x10—ACTIVE</p> <p>0x0—AAL5-SNAP</p> <p>0x1—AAL5-NLPID</p> <p>0x2—AAL5-FRNLPID</p> <p>0x3—AAL5-MUX</p> <p>0x4—AAL3/4-SMDS</p> <p>0x5—QSAAL</p> <p>0x6—ILMI</p> <p>0x7—AAL5-LANE</p> <p>0x8—AAL5-CISCOPPP</p>
PeakRate	Kilobits per second transmitted at the peak rate.
Average Rate	Kilobits per second transmitted at the average rate.
Burst Cells	Value that, when multiplied by 32, equals the maximum number of ATM cells the virtual circuit can transmit at peak rate.
VCmode	AIP-specific or NPM-specific register describing the usage of the virtual circuit. This register contains values such as rate queue, peak rate, and AAL mode, which are also displayed in other fields.
virtual-access	Virtual access interface identifier.
virtual-template	Virtual template identifier.
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.

Table 4 Show ATM VC Field Descriptions (Continued)

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.
OAM frequency: 10	OAM cells are sent every 10 seconds.
OAM F5 cells sent: 1	Number of OAM cells sent on this virtual circuit.
OAM cells received: 0	Number of OAM cells received on this virtual circuit.
TTL	Time-to-live in ATM hops across the VC.
VC owner	IP Multicast address of group.

Related Commands

You can use the master indexes or search online to find documentation of related commands.

atm-nsap

atm pvc

map-list

show dxi map

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

show dxi map

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

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 172.21.177.1
  DFA 35(0x23,0x830), static,
  broadcast, vpi = 2, vci = 3,
  encapsulation: VC based MUX,
  Linktype IP
```

Table 5 explains significant fields shown in the display.

Table 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 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 <i>SNAP</i> , <i>NLPID</i> , or <i>VC based MUX</i> .
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
```

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

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 6 describes significant fields shown in the display.

Table 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 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.

Table 6 Show DXI PVC Field Descriptions (Continued)

Field	Description
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 interfaces atm

Use the **show interfaces atm** privileged EXEC command to display information about the ATM interface.

show interfaces atm [*slot/port*] (Cisco 7200 series with ATM port adapter; and Cisco 7500 series with AIP)

show interfaces atm [*slot/port-adapter/port*] (Cisco 7500 series with ATM port adapter)

Syntax Description

<i>slot</i>	(Optional) ATM slot number for the following: <ul style="list-style-type: none"> • AIP on Cisco 7500 series routers. • ATM port adapter on Cisco 7200 series routers and Cisco 7500 series routers.
<i>port-adapter</i>	(Optional) Port adapter number on the VIP2, either 0 or 1.
<i>port</i>	(Optional) Port number; the value must be 0.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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 7 describes the fields shown in both the displays.

Table 7 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	Indicates whether keepalives are set or not.
Encapsulation(s)	Type of encapsulation used on the interface (for example, AAL5, and either PVC or SVC mode).

Table 7 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 VCs	Number of virtual circuit connections currently open.
VC idle disconnect time	Number of seconds the SVC must be idle before the SVC is disconnected.
Signalling 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.
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 queueing 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.
Received broadcasts	Total number of broadcast or multicast packets received by the interface.

Table 7 Show Interfaces ATM Field Descriptions (Continued)

Field	Description
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 CRC's is usually the result of collisions or a station transmitting bad data. On a serial link, CRC's 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 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.
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.

Table 7 Show Interfaces ATM Field Descriptions (Continued)

Field	Description
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.

show sscop

To show Service-Specific Connection-Oriented Protocol (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

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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 8 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 8 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.

Table 8 Show SSCOP Field Descriptions (Continued)

Field	Description
Rcv Sequence Number	Sequence number of packets received.
Poll Sequence Number	Current poll sequence number.
Poll Ack Sequence Number	Poll sequence number already acknowledged.
Vt(Pd)	Number of sequenced data (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. To restore the default value, use the **no** form of this command.

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

This command first appeared in Cisco IOS Release 10.0.

The connection control timer determines the time between transmission of BGN (establishment), END (release), or RS (resynchronization) protocol data units (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 Commands

You can use the master indexes or search online to find documentation of related commands.

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 sequential data (SD) or SDP PDUs are queued for transmission or are outstanding pending acknowledgments.

Default

30 seconds

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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 (establishment), END (release), or RS (resynchronization) PDUs as long as an acknowledgment has not been received. Valid range is 1 to 6000. The default is 10.

Default

10 retries

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Example

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

```
sscop max-cc 20
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

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. The default is 10 seconds.

Default

10 seconds

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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. The default is 7.

Default

7 packets

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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. The default is 7.

Default

7 packets

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Example

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

```
sscop send-window 10
```

