

Enhanced ATM VC Configuration and Management Commands

Command Reference

This section documents new or modified Enhanced ATM VC Configuration and Management commands. All other commands used with this feature set are documented in the Cisco IOS Release 11.3 command references.

- **atm ilmi-pvc-discovery**
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atm ilmi-pvc-discovery

To enable ATM PVC discovery, use the **atm ilmi-pvc-discovery** interface configuration command. Use the **no** form of this command to disable PVC Discovery.

```
atm-ilmi-discovery [subinterface]
no atm-ilmi-discovery [subinterface]
```

Syntax Description

subinterface (Optional) When this keyword is used, the discovered PVCs are assigned to the ATM subinterface whose number matches the discovered PVC's VPI number. For example, a PVC with VPI 1 will be assigned to ATM subinterface 2/0.1.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Example

The following example enables PVC Discovery on the ATM main interface 2/0. The keyword **subinterface** is used so that all discovered PVCs with a VPI value of 1 will be assigned to the subinterface 2/0.1:

```
interface atm 2/0
  pvc RouterA 0/16 ilmi
  exit
  atm ilmi-pvc-discovery subinterface
  exit

interface atm 2/0.1 multipoint
  ip address 172.21.51.5 255.255.255.0
```

atm oam flush

To clear incoming OAM cells on an ATM interface, use the **atm oam flush** interface configuration command. Use the **no** form of this command to disable flushing.

atm oam flush
no atm oam flush

Syntax Description

This command has no arguments or keywords.

Default

Flushing of OAM cells is disabled.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Example

The following example enables OAM flushing on the ATM main interface with slot 0 and port 0:

```
interface atm 0/0
 atm oam flush
```

atm rate-queue

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

```
atm rate-queue {queue-number speed | tolerance svc [pvc] tolerance-value [strict] }  
no atm rate-queue {queue-number speed | tolerance svc [pvc] tolerance-value [strict] }
```

Syntax Description

<i>queue-number</i>	Queue number in the range 0 through 7 on the AIP for Cisco 7500 series routers, and in the range 0 through 3 on the NPM for the Cisco 4500 and 4700 routers. On the AIP, 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. On the NPM, all 4 queues have the same priority.
<i>speed</i>	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: <ul style="list-style-type: none">• 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)
tolerance	Specifies that you want to use a rate queue tolerance value.
svc	Specifies that the <i>tolerance-value</i> will be applied to SVCs.
pvc	(Optional) If specified, the <i>tolerance-value</i> will be applied to PVCs.
<i>tolerance-value</i>	A tolerance level expressed as a percentage used for assigning rate queues for each VC with a requested peak rate. This value is applied to SVCs, discovered VCs, and PVCs (when the pvc keyword is used). This value can be 0 or 5 through 99. For SVCs and discovered VCs, the default value is 10. For PVCs, the default value is 0.
strict	(Optional) Indicates whether SVC traffic shaping parameters are altered beyond the SVC tolerance or rejects the incoming call.

Default

No rate queue is defined. The default rate-queue tolerance for SVCs and discovered VCs is 10. For PVCs, it is 0.

Command Mode

Interface configuration

Usage Guidelines

The **atm rate-queue** command first appeared in Cisco IOS Release 10.0. The **tolerance svc** keywords and associated arguments first appeared in Cisco IOS Release 11.3 T.

If a PVC or SVC is created, and its rate queue does not match a permanent rate queue that was created using the **atm-rate queue queue-number speed** command, one of the following will occur:

- The PVC or SVC will use an existing rate queue if the PVC or SVC's rate queue falls within the *tolerance-value* specified.
- The software will dynamically create a new and unique rate queue if the PVC or SVC does not fall within a previously configured rate-queue tolerance.

Examples

The following example configures a permanent rate queue with a *queue-number* of 1 and a *speed* of 100 Mbps:

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

The following example configures a rate queue with a *tolerance-value* of 20 which will apply to SVCs, discovered VCs, and PVCs.

```
interface atm 2/0
atm rate-queue tolerance svc pvc 20
```

Related Commands

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

pvc
svc

broadcast

To configure broadcast packet duplication and transmission for an ATM PVC, SVC, or VC class, use the **broadcast** command in the appropriate command mode. Use the **no** form of this command to disable transmission of broadcast packets for your ATM PVC, SVC, or VC class. Use the **default** form of this command to restore the default behavior according to the description in the “Usage Guidelines” section below.

broadcast
no broadcast
default broadcast

Syntax Description

This command has no arguments or keywords.

Default

Disabled. For classical IP SVCs, broadcast is enabled.

Command Mode

Interface-ATM-VC configuration (for ATM PVCs and SVCs)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If broadcasting and multipoint signaling is enabled on an SVC, a multipoint SVC will be created to handle the SVC.

Note If you use the **protocol** command to configure broadcasting for an ATM PVC, SVC, or VC class, this configuration takes precedence over any previous configuration using the **broadcast** command.

If the **broadcast** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **broadcast** command in a VC class assigned to the PVC or SVC itself.
- Configuration of the **broadcast** command in a VC class assigned to the PVC’s or SVC’s ATM subinterface.
- Configuration of the **broadcast** command in a VC class assigned to the PVC’s or SVC’s ATM main interface.
- Global default: Disabled. For classical IP SVCs, broadcast is enabled.

Example

The following command enables the transmission of broadcast packets on an ATM PVC named router5:

```
pvc router5 1/32  
  broadcast
```

Related Commands

protocol

class

To assign a VC class to an ATM main interface, subinterface, PVC, or SVC, use the **class** command in the appropriate command mode. Use the **no class** form of this command to remove a VC class.

```
class vc-class-name  
no class vc-class-name
```

Syntax Description

vc-class-name Name of the VC class you are assigning to your ATM main interface, subinterface, PVC, or SVC.

Default

No VC class is assigned.

Command Mode

Interface configuration (for ATM main and subinterfaces)

Interface-ATM-VC configuration (for ATM PVCs and SVCs)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Use this command to assign a previously defined set of parameters to an ATM main interface, subinterface, PVC, or SVC. This set of parameters is defined in a VC class.

Examples

The following example assigns a VC class named atm-ubr to a PVC named router5. This VC class may contain UBR settings that were configured using the **ubr** command.

```
pvc router5 1/32  
  class atm-ubr
```

The following example assigns a VC class named atm-svc-parameters to an SVC named lion. This VC class may contain ATM SVC default parameters.

```
svc lion 47.0091.81.000000.0040.0B0A.2501.ABC1.3333.3333.05  
  class atm-svc-parameters
```

encapsulation

To configure the ATM adaptation layer (AAL) and encapsulation type for an ATM PVC, SVC, or VC class, use the **encapsulation** command in the appropriate command mode. Use the **no** form of this command to remove an encapsulation from a PVC, SVC, or VC class.

```
encapsulation aal-encap [virtual-template number]  
no encapsulation aal-encap [virtual-template number]
```

Note To configure ILMI, QSAAL, or SMDS encapsulations for an ATM PVC, use the **pvc** command.

Syntax Description

aal-encap

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

aal5ciscopp—For Cisco PPP over ATM. Supported on ATM PVCs only.

aal5mux apollo—For a multiplex (MUX)-type virtual circuit using the Apollo protocol.

aal5mux appletalk—For a MUX-type virtual circuit using the AppleTalk protocol.

aal5mux decnet—For a MUX-type virtual circuit using the DECnet protocol.

aal5mux ip—For a MUX-type virtual circuit using the IP protocol.

aal5mux ipx—For a MUX-type virtual circuit using the IPX protocol.

aal5mux vines—For a MUX-type virtual circuit using the VINES protocol.

aal5mux xns—For a MUX-type virtual circuit using the XNS protocol.

aal5nlpid—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). Supported on ATM PVCs only.

aal5snap—The only encapsulation supported for Inverse ARP. Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) precedes the protocol datagram.

virtual-template *number* (This argument is required for **aal5ciscopp** encapsulation only). Specifies the number used to identify the virtual template.

Default

The global default encapsulation is **aal5snap**. See the “Usage Guidelines” section for other default characteristics.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Use of one of the **aal5mux** encapsulation options to dedicate the specified PVC to a single protocol; use the **aal5snap** encapsulation option to multiplex two or more protocols over the same PVC.

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 PVCs 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.

When configuring Cisco PPP over ATM, specify the **aal5ciscoPPP** encapsulation for the *aal-encap* argument and specify the virtual template *number*.

It is possible to implicitly create a virtual template when configuring Cisco 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, we recommend that you explicitly create and configure the virtual template before configuring the ATM PVC to ensure such parameters take effect.

If you specify virtual template parameters after the ATM PVC is 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.

If the **encapsulation** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **encapsulation** command in a VC class assigned to the PVC or SVC itself.
- Configuration of the **encapsulation** command in a VC class assigned to the PVC's or SVC's ATM subinterface.
- Configuration of the **encapsulation** command in a VC class assigned to the PVC's or SVC's ATM main interface.
- Global default: *aal-encap* = **aal5snap**.

Example

The following example configures an ATM PVC with VPI 0 and VCI 33 for a MUX-type encapsulation using IP:

```
pvc 0/33
 encapsulation aal5mux ip
```

idle-timeout

To configure the idle timeout parameter for tearing down an ATM SVC connection, use the **idle-timeout** command in the appropriate command mode. Use the **no** form of this command to disable the timeout parameter.

```
idle-timeout seconds [minimum-rate]  
no idle-timeout seconds [minimum-rate]
```

Syntax Description

<i>seconds</i>	Number of seconds that the SVC is idle (no traffic flows), after which the ATM SVC connection is torn down.
<i>minimum-rate</i>	(Optional) Minimum traffic rate in kilobits per second (Kbps) required on an ATM SVC to maintain the SVC connection.

Default

seconds = The value set using the interface configuration **atm idle-timeout** command. If the **atm idle-timeout** is not configured, the default is 300 seconds; *minimum-rate* = 0 Kbps.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Note If within the idle timeout period, both the input and output traffic rates are below the *minimum-rate*, the SVC connection is torn down. The input and output traffic rates are set using the **ubr**, **ubr+**, or **vbr-nrt** command.

If the **idle-timeout** command is not explicitly configured on an ATM SVC, the SVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **idle-timeout** command in a VC class assigned to the SVC itself.
- Configuration of the **idle-timeout** command in a VC class assigned to the SVC's ATM subinterface.
- Configuration of the **idle-timeout** command in a VC class assigned to the SVC's ATM main interface.
- Global default: *seconds* = The value set using the interface configuration **atm idle-timeout** command. If the **atm idle-timeout** is not configured, the default is 300 seconds; *minimum-rate* = 0 Kbps.

Example

The following example configures an ATM SVC connection to be inactive if no traffic flows for an idle period of 300 seconds. The SVC connection is also configured so that it is considered inactive if the traffic rate is less than 5 Kbps:

```
idle-timeout 300 5
```

Related Commands

atm idle-timeout

ubr

ubr+

vbr-nrt

ilmi manage

To enable ILMI management on an ATM PVC, use the **ilmi manage** command in the appropriate command mode. Use the **no** form of this command to disable ILMI management.

ilmi manage
no ilmi manage

Syntax Description

This command has no arguments or keywords.

Default

ILMI management is disabled.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If the **ilmi manage** command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **ilmi manage** command in a VC class assigned to the PVC itself.
- Configuration of the **ilmi manage** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **ilmi manage** command in a VC class assigned to the PVC's ATM main interface.
- Global default: ILMI management is disabled.

Example

The following example enables ILMI management on the ATM PVC with VPI 0 and VCI 60. The ILMI PVC is assigned the name routerA and the VPI and VCI are 0 and 16, respectively.

```
interface atm 0/0
  pvc routerA 0/16 ilmi
  exit
interface atm 0/0.1 multipoint
  pvc 0/60
  ilmi manage
```

inarp

To configure the Inverse ARP time period for an ATM PVC or VC class, use the **inarp** command in the appropriate command mode. Use the **no** form of this command to store the default Inverse ARP time period behavior.

inarp *minutes*
no inarp *minutes*

Syntax Description

minutes Number of minutes for the Inverse ARP time period. Default is 15 minutes.

Default

When Inverse ARP is enabled, *minutes* = 15 minutes.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

This command is only supported for **aal5snap** encapsulation when Inverse ARP is enabled. Refer to the **encapsulation** command for configuring **aal5snap** encapsulation and the **protocol** command for enabling Inverse ARP.

If the **inarp** command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **inarp** command in a VC class assigned to the PVC itself.
- Configuration of the **inarp** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **inarp** command in a VC class assigned to the PVC's ATM main interface.
- Global default: *minutes* = 15 minutes. This assumes that Inverse ARP is enabled.

Example

The following example sets the Inverse ARP time period for 10 minutes:

```
inarp 10
```

Related Commands

encapsulation
protocol

oam-pvc

To enable end-to-end F5 OAM loopback cell generation and OAM management for an ATM PVC or VC class, use the **oam-pvc** command in the appropriate command mode. Use the **no** form of this command to disable generation of OAM loopback cells and OAM management.

```
oam-pvc [manage] [frequency]  
no oam-pvc [manage] [frequency]
```

Syntax Description

manage	(Optional) Enable OAM management.
<i>frequency</i>	(Optional) Number of seconds between transmitting OAM loopback cells. Values range from 0 to 600 seconds. Default is 10 seconds.

Default

End-to-end F5 OAM loopback cell generation and OAM management are disabled, but if OAM cells are received, they are looped back. The default value for the *frequency* is 10 seconds.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If OAM management is enabled, further control of OAM management is configured using the **oam retry** command.

If the **oam-pvc** command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **oam-pvc** command in a VC class assigned to the PVC itself.
- Configuration of the **oam-pvc** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **oam-pvc** command in a VC class assigned to the PVC's ATM main interface.
- Global default: End-to-end F5 OAM loopback cell generation and OAM management are disabled, but if OAM cells are received, they are looped back. The default value for the *frequency* is 10 seconds.

Example

The following example enables end-to-end F5 OAM loopback cell transmission and OAM management on an ATM PVC with a transmission frequency of 3 seconds:

```
oam-pvc manage 3
```

Related Commands

ilmi manage

oam retry

oam retry

To configure parameters related to OAM management for an ATM PVC, SVC, or VC class, use the **oam retry** command in the appropriate command mode. Use the **no** form of this command to remove OAM management parameters.

```
oam retry up-count down-count retry-frequency
no oam retry up-count down-count retry-frequency
```

Syntax Description

<i>up-count</i>	Number of consecutive end-to-end F5 OAM loopback cell responses that must be received in order to change a PVC connection state to up. This argument does not apply to SVCs.
<i>down-count</i>	Number of consecutive end-to-end F5 OAM loopback cell responses that are not received in order to change a PVC state to down or tear down an SVC connection.
<i>retry-frequency</i>	The frequency (in seconds) that end-to-end F5 OAM loopback cells are transmitted when a change in UP/DOWN state of a PVC or SVC is being verified. For example, if a PVC is up and a loopback cell response is not received after the <i>frequency</i> (in seconds) specified using the oam-pvc command, then loopback cells are sent at the <i>retry-frequency</i> to verify whether or not the PVC is down.

Default

up-count = 3, *down-count* = 5, *retry-frequency* = 1 second. This assumes that OAM management is enabled using the **oam-pvc** or **oam-svc** command. The *up-count* argument does not apply to SVCs.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If the **oam retry** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **oam retry** command in a VC class assigned to the PVC or SVC itself.
- Configuration of the **oam retry** command in a VC class assigned to the PVC's or SVC's ATM subinterface.
- Configuration of the **oam retry** command in a VC class assigned to the PVC's or SVC's ATM main interface.
- Global default: *up-count* = 3, *down-count* = 5, *retry-frequency* = 1 second. This assumes that OAM management is enabled using the **oam-pvc** or **oam-svc** command. The *up-count* and *retry-frequency* arguments do not apply to SVCs.

Example

The following example configures the OAM management parameters with *up-count* 3, *down-count* 3, and the *retry-frequency* at 10 seconds:

```
oam retry 3 3 10
```

Related Commands

oam-pvc

oam-svc

oam-svc

To enable end-to-end F5 OAM loopback cell generation and OAM management for an ATM SVC or VC class, use the **oam-svc** command in the appropriate command mode. Use the **no** form of this command to disable generation of OAM loopback cells and OAM management.

```
oam-svc [manage] [frequency]  
no oam-svc [manage] [frequency]
```

Syntax Description

manage	(Optional) Enable OAM management.
<i>frequency</i>	(Optional) Number of seconds between transmitting OAM loopback cells. Values range from 0 to 600 seconds. Default is 10 seconds.

Default

End-to-end F5 OAM loopback cell generation and OAM management are disabled, but if OAM cells are received, they are looped back. The default value for the *frequency* is 10 seconds.

Command Mode

Interface-ATM-VC configuration (for an ATM SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If OAM management is enabled, further control of OAM management is configured using the **oam retry** command.

Note Generally, ATM signaling manages ATM SVCs. Configuring the **oam-svc** command on an SVC verifies the inband integrity of the SVC.

If the **oam-svc** command is not explicitly configured on an ATM SVC, the SVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **oam-svc** command in a VC class assigned to the SVC itself.
- Configuration of the **oam-svc** command in a VC class assigned to the SVC's ATM subinterface.
- Configuration of the **oam-svc** command in a VC class assigned to the SVC's ATM main interface.
- Global default: End-to-end F5 OAM loopback cell generation and OAM management are disabled, but if OAM cells are received, they are looped back. The default value for the *frequency* is 10 seconds.

Example

The following example enables end-to-end F5 OAM loopback cell transmission and OAM management on an ATM SVC with a transmission frequency of 3 seconds:

```
oam-svc manage 3
```

Related Commands

oam retry

protocol

Use the **protocol** command in the appropriate command mode to do one or more of the following:

- Configure a static map for an ATM PVC, SVC, or VC class.
- Enable Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC or in a VC class (applies to IP and IPX protocols only).

Use the **no** form of this command to remove a static map or disable Inverse ARP.

```
protocol protocol {protocol-address | inarp} [[no] broadcast]
no protocol protocol {protocol-address | inarp} [[no] broadcast]
```

Syntax Description

protocol

Choose one of the following keywords:

aarp—AppleTalk ARP

apollo—Apollo domain

appletalk—AppleTalk

arp—IP ARP

bridge—bridging

bstun—block serial tunnel

cdp—Cisco Discovery Protocol

clns—ISO CLNS

clns_es—ISO CLNS end system

clns_is—ISO CLNS intermediate system

cmns—ISO CMNS

compressedtcp—Compressed TCP

decnet—DECnet

decnet_node—DECnet node

decnet_prime_router—DECnet prime router

decnet_router-l1—DECnet router L1

decnet_router-l2—DECnet router L2

dls—data link switching

ip—IP

ipx—Novell IPX

llc2—llc2

pad—PAD links
qlc—Qualified Logical Link Control protocol
rsrb—remote source-route bridging
snapshot—snapshot routing support
stun—serial tunnel
vines—Banyan VINES
xns—Xerox Network Systems protocol

protocol-address Destination address that is being mapped to this PVC.

inarp (Only valid for IP and IPX protocols on PVCs) Use this keyword to enable Inverse ARP on an ATM PVC. If you specify a *protocol-address* instead of **inarp**, Inverse ARP is automatically disabled for that protocol.

[no] broadcast (Optional) **broadcast** indicates that this map entry is used when the corresponding protocol sends broadcast packets to the interface. For example, IGRP updates. Pseudobroadcasting is supported. The **broadcast** keyword of the **protocol** command takes precedence if you previously configured the **broadcast** command on the ATM PVC or SVC.

Default

Inverse ARP is enabled for IP and IPX if the protocol is running on the interface and no static map is configured.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If the **protocol** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **protocol ip inarp** or **protocol ipx inarp** command in a VC class assigned to the PVC or SVC itself.
- Configuration of the **protocol ip inarp** or **protocol ipx inarp** command in a VC class assigned to the PVC's or SVC's ATM subinterface.
- Configuration of the **protocol ip inarp** or **protocol ipx inarp** command in a VC class assigned to the PVC's or SVC's ATM main interface.
- Global default: Inverse ARP is enabled for IP and IPX if the protocol is running on the interface and no static map is configured.

Examples

The following example creates a static map on a VC, indicates that 192.68.34.237 is connected to this VC, and sends ATM pseudobroadcasts:

```
protocol ip 192.68.34.237 broadcast
```

The following example enables Inverse ARP for IPX and does not send ATM pseudobroadcasts:

```
protocol ipx inarp no broadcast
```

The following example removes a static map from a VC and restores the default behavior for Inverse ARP (Refer to the “Default” section described above):

```
no protocol ip 192.68.34.237
```

pvc

Use the **pvc** interface configuration command to do one or more of the following:

- Create an ATM PVC on a main interface or subinterface.
- Assign a name to an ATM PVC.
- Specify ILMI, QSAAL, or SMDS as the encapsulation type on an ATM PVC. (To configure other encapsulations types, see the **encapsulation** command).
- Enter interface-ATM-VC configuration mode.

To remove an ATM PVC, use the **no** form of this command.

```
pvc [name] vpi/vci [ilmi | qsaal | smds]
no pvc [name] vpi/vci [ilmi | qsaal | smds]
```

Syntax Description

<i>name</i>	(Optional) The name of the PVC or map. The name can be up to 16 characters long.
<i>vpi/</i>	<p>ATM network virtual path identifier (VPI) for this PVC. The absence of the “/” and a <i>vpi</i> value defaults the <i>vpi</i> value to 0.</p> <p>On the Cisco 7200 and 7500 series routers, this value ranges from 0 to 255; on the Cisco 4500 and 4700 routers, this value ranges from 0 to 1 less than the quotient of 8192 divided by the value set by the atm vc-per-vp command.</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) for this PVC. This value ranges from 0 to 1 less than the maximum value set for this interface by the atm vc-per-vp 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>
ilmi	(Optional) 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	(Optional) 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.

smds (Optional) Encapsulation for SMDS networks. If you are configuring an ATM PVC on the ATM Interface Processor (AIP), you must configure AAL3/4SMDS using the **atm aal aal3/4** command before specifying **smds** encapsulation. If you are configuring an ATM network processor module (NPM), the **atm aal aal3/4** command is not required. SMDS encapsulation is not supported on the ATM port adapter.

Default

No PVC is defined. When a PVC is defined, the global default of the **encapsulation** command applies (*aal-encap* = **aal5snap**).

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

The Cisco IOS software dynamically creates rate queues as necessary to satisfy the requests of the **pvc** commands.

The **pvc** command creates a PVC and attaches it to the VPI and VCI specified. Both *vpi* and *vci* cannot be simultaneously specified as 0; if one is 0, the other cannot be 0.

When configuring an SVC, use the **pvc** command to configure the PVC that handles SVC call setup and termination. In this case, specify the **qsaal** keyword. See the second example that follows.

Once you specify a *name* for a PVC, you can reenter the interface-ATM-VC configuration mode by simply entering **pvc name**. You can remove a PVC and any associated parameters by entering **no pvc name** or **no pvc vpi/vci**.

Note After configuring the parameters for an ATM PVC, you must exit the interface-ATM-VC configuration mode in order to create the PVC and enable the settings.

If **ilmi**, **qsaal**, or **smds** encapsulation is not explicitly configured on the ATM PVC, the PVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **encapsulation** command in a VC class assigned to the PVC itself.
- Configuration of the **encapsulation** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **encapsulation** command in a VC class assigned to the PVC's ATM main interface.
- Global default: The global default of the **encapsulation** command applies. *aal-encap* = **aal5snap**.

Examples

The following example creates a PVC with VPI 0 and VCI 16, and communication is set up with the ILMI:

```
pvc cisco 0/16 ilmi
exit
```

The following example creates a PVC used for ATM signaling for an SVC. It specifies VPI 0 and VCI 5:

```
pvc cisco 0/5 qsaal
exit
```

Related Commands

atm vc-per-vc

show arp

Use the **show arp** privileged EXEC command to display the entries in the ARP table.

show arp

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 arp** command:

```
Router# show arp

Protocol    Address          Age (min)    Hardware Addr      Type    Interface
-----
Internet    172.20.42.112   120          0000.a710.4baf     ARPA    Ethernet3
AppleTalk   4028.5           29           0000.0c01.0e56     SNAP    Ethernet2
Internet    172.20.42.114   105          0000.a710.859b     ARPA    Ethernet3
AppleTalk   4028.9           -            0000.0c02.a03c     SNAP    Ethernet2
Internet    172.20.42.121   42           0000.a710.68cd     ARPA    Ethernet3
Internet    172.20.36.9     -            0000.3080.6fd4     SNAP    TokenRing0
AppleTalk   4036.9           -            0000.3080.6fd4     SNAP    TokenRing0
Internet    172.20.33.9     -            c222.2222.2222     SMDS    Serial0
Internet    2.2.2.2         0            0 / 60             ATM     ATM2/0.2
```

Table 1 describes the fields shown in the display.

Table 1 Show ARP Field Descriptions

Field	Description
Protocol	Type of network address this entry includes.
Address	Network address that is mapped to the Media Access Control (MAC) address in this entry.
Age (min)	Interval (in minutes) since this entry was entered in the table, rather than the interval since the entry was last used. (The timeout value is 4 hours.)
Hardware Addr	MAC address mapped to the network address in this entry. For an ATM interface, this is the VPI/VCI.

Table 1 **Show ARP Field Descriptions (Continued)**

Field	Description
Type	Encapsulation type used for the network address in this entry. Possible values include: <ul style="list-style-type: none">• ARPA• ATM• ETLK (EtherTalk)• SMDS• SNAP
Interface	Interface associated with this network address.

show atm class-links

To display VC parameter configurations and where the parameter values are inherited from, use the **show atm class-links** privileged EXEC command.

```
show atm class-links {vpi/vci | name}
```

Syntax Description

vpi/vci The ATM VPI and VCI numbers. The absence of the slash character (/) and a *vpi* value defaults the *vpi* value to 0.

name Name of the VC.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Sample Display

The following is sample output from the **show atm class-links** command for VPI 0 and VCI 66:

```
Router# show atm class-links 0/66

Displaying vc-class inheritance for ATM2/0.3, vc 0/66:
broadcast - VC-class configured on main-interface
encapsulation aal5mux ip - VC-class configured on subinterface
no ilmi manage - Not configured - using default
oam-pvc manage 3 - VC-class configured on vc
oam retry 3 5 1 - Not configured - using default
ubr 10000 - Configured on vc directly
```

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
```

The following is sample output from the **show atm map** command if you configure an ATM PVC using the **pvc** command:

```
Router# show atm map
Map list endA : PERMANENT
ip 148.11.11.1 maps to VC 4, VPI 0, VCI 60, ATM0.2
```

Table 2 describes significant fields shown in the displays.

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. (For ATM VCs configured with the atm pvc command).
<i>protocol address</i> maps to VPI <i>x</i> , VCI <i>x</i> , ATM <i>x.x</i> or <i>protocol address</i> maps to NSAP..	Name of protocol, the protocol address, the VPI number, the VCI number, and the ATM interface or subinterface. (For ATM PVCs configured using the pvc command.) or Name of the protocol, the protocol address, and the NSAP that the address is mapped to. (For ATM SVCs configured using the svc command.)
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.
VPI	Virtual path identifier for the VC.
VCI	Virtual channel identifier for the VC.
ATM <i>x.x</i>	ATM interface or subinterface number.

Related Commands

atm pvc
map-list
protocol
pvc
svc

show atm pvc

To display all ATM PVCs and traffic information, use the **show atm pvc** privileged EXEC command.

```
show atm pvc [vpi/vci | name | interface atm interface_number]
```

Syntax Description

<i>vpi/vci</i>	(Optional) The ATM VPI and VCI numbers. The absence of the slash character (/) and a <i>vpi</i> value defaults the <i>vpi</i> value to 0.
<i>name</i>	(Optional) Name of the PVC.
interface atm <i>interface_number</i>	(Optional) Interface number or subinterface number of the PVC. Displays all PVCs on the specified interface or subinterface. The <i>interface_number</i> uses one of the following formats, depending on what router platform you are using: <i>slot/0</i> [<i>.subinterface-number multipoint</i>] (for the AIP on Cisco 7500 series routers and ATM port adapter on the Cisco 7200 series routers) <i>number</i> [<i>.subinterface-number multipoint</i>] (for the NPM on Cisco 4500 and 4700 routers) <i>slot/port-adapter/0</i> [<i>.subinterface-number multipoint</i>] (for the ATM port adapter on Cisco 7500 series routers) For a description of these arguments, refer to the interface atm command.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If the *vpi/vci* or *name* is not specified, the output of this command is the same as that of the **show atm vc** command but only the configured PVCs are displayed. See the first sample output below.

If the *vpi/vci* or *name* is specified, the output of this command is the same as the **show atm vc vcd** command, plus extra information related to PVC management including connection name, detailed states, and OAM counters. See the second sample output below.

If the **interface atm** *interface-number* option is included in the command, all PVCs under that interface or subinterface are displayed. See the third sample output below.

Sample Displays

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

```
Router# show atm pvc
```

Interface	VCD/ Name	VPI	VCI	Type	Encaps	Peak Kbps	Avg/Min Kbps	Burst Cells	Sts
2/0	1	0	5	PVC	SAAL	155000	155000		UP
2/0	2	0	16	PVC	ILMI	155000	155000		UP
2/0.2	101	0	50	PVC	SNAP	155000	155000		UP
2/0.2	102	0	60	PVC	SNAP	155000	155000		DOWN
2/0.2	104	0	80	PVC	SNAP	155000	155000		UP
2/0	hello	0	99	PVC	SNAP	1000			UP

The following is sample output from the **show atm pvc** command with the *vpi/vci* specified:

```
Router# show atm pvc 0/99
```

ATM 2/0.2: VCD 102, VPI: 0, VCI: 60
 UBR, PeakRate: 155000
 AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x1
 OAM frequency: 3 second(s), OAM retry frequency: 1 second(s)
 OAM up retry count: 3, OAM down retry count: 5
 OAM Loopback status: OAM Sent
 OAM VC state: Not Verified
 ILMI VC state: Not Managed
 VC is managed by OAM
 InARP frequency: 15 minute(s)
 InPkts: 1, OutPkts: 1, InBytes: 32, OutBytes: 32
 InProc: 1, OutProc: 0, Broadcasts: 0
 InFast: 0, OutFast:0, InAS: 0, OutAS: 0
 OAM cells received: 14
 F5 InEndloop: 14, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
 F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI: 0
 OAM cells sent: 25
 F5 OutEndloop: 25, F5 OutSegloop: 0, F5 OutRDI: 0
 OAM cell drops: 0
 PVC Discovery: NOT_VERIFIED
 Status: DOWN, State: NOT_VERIFIED

The following is sample output from the **show atm pvc** command with the ATM subinterface specified:

```
Router# show atm pvc interface atm 2/0.2
```

Interface	VCD/ Name	VPI	VCI	Type	Encaps	Peak Kbps	Avg/Min Kbps	Burst Cells	Sts
2/0.2	101	0	50	PVC	SNAP	155000	155000		UP
2/0.2	102	0	60	PVC	SNAP	155000	155000		DOWN
2/0.2	104	0	80	PVC	SNAP	155000	155000		UP

Table 3 describes significant fields shown in the displays.

Table 3 Show ATM PVC Field Descriptions

Field	Description
Interface	Interface and subinterface slot and port.
VCD/Name	Virtual circuit descriptor (virtual circuit number). The connection name is displayed if a name for the VC was configured using the pvc command.
VPI	Virtual path identifier.
VCI	Virtual channel identifier.

Table 3 Show ATM PVC Field Descriptions (Continued)

Field	Description
Type	Type of PVC detected from PVC discovery, either PVC-D, PVC-L, or PVC-M. <ul style="list-style-type: none"> • PVC-D indicates a PVC created due to PVC discovery. • PVC-L indicates that the corresponding peer of this PVC could not be found on the switch. • PVC-M indicates that some or all of the QOS parameters of this PVC mismatch that of the corresponding peer on the switch.
Encaps	Type of ATM adaptation layer (AAL) and encapsulation.
Peak or PeakRate	Kilobits per second transmitted at the peak rate.
Avg/Min or Average Rate	Kilobits per second transmitted at the average rate.
Burst Cells	Value that equals the maximum number of ATM cells the virtual circuit can transmit at peak rate.
Sts or Status	Status of the VC connection. <ul style="list-style-type: none"> • UP indicates that the connection is enabled for data traffic. • DOWN indicates that the connection is not ready for data traffic. When the Status field is DOWN, a State field is shown. See a description of the different values for this field listed later in this table. • INACTIVE indicates that the interface is down.
Connection Name	The name of the PVC.
UBR, UBR+, or VBR-NRT	UBR—Unspecified Bit Rate QOS is specified for this PVC. See the ubr command for further information. UBR+—Unspecified Bit Rate QOS is specified for this PVC. See the ubr+ command for further information. VBR-NRT—Variable Bit Rate–Non Real Time QOS rates are specified for this PVC. See the vbr-nrt command for further information.
etype	Encapsulation type.

Table 3 Show ATM PVC Field Descriptions (Continued)

Field	Description
Flags	Bit mask describing virtual circuit information. The flag values are summed to result in the displayed value. 0x40—SVC 0x20—PVC 0x10—ACTIVE 0x0—AAL5-SNAP 0x1—AAL5-NLPID 0x2—AAL5-FRNLPID 0x3—AAL5-MUX 0x4—AAL3/4-SMDS 0x5—QSAAL 0x6—ILMI 0x7—AAL5-LANE 0x9—AAL5-CISCOPPP
virtual-access	Virtual access interface identifier.
virtual-template	Virtual template identifier.
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.
OAM frequency	Number of seconds between sending OAM loopback cells.
OAM retry frequency	The frequency (in seconds) that end-to-end F5 loopback cells should be transmitted when a change in UP/DOWN state is being verified. For example, if a PVC is up and a loopback cell response is not received after the <i>frequency</i> (in seconds) specified using the oam-pvc command, then loopback cells are sent at the <i>retry-frequency</i> to verify whether or not the PVC is down.
OAM up retry count	Number of consecutive end-to-end F5 OAM loopback cell responses that must be received in order to change a PVC state to up. Does not apply to SVCs.
OAM down retry count	Number of consecutive end-to-end F5 OAM loopback cell responses that are not received in order to change a PVC state to down or tear down an SVC.
OAM Loopback status	Status of end-to-end F5 OAM loopback cell generation for this VC. This field will have one of the following values: <ul style="list-style-type: none"> • OAM Disabled—End-to-End F5 OAM loopback cell generation is disabled. • OAM Sent—OAM cell was sent. • OAM Received—OAM cell was received. • OAM Failed—OAM reply was not received within the frequency period or contained bad correlation tag.ssss

Table 3 Show ATM PVC Field Descriptions (Continued)

Field	Description
OAM VC state	This field will have one of the following states for this VC: <ul style="list-style-type: none"> • AIS/RDI—The VC received AIS/RDI cells. End-to-end F5 OAM loopback cells are not sent in this state. • Down Retry—An OAM loopback failed. End-to-end F5 OAM loopback cells are sent at retry frequency to verify the VC is really down. After down-count unsuccessful retries, the VC goes to the Not Verified state. • Not Managed—VC is not being managed by OAM. • Not Verified—VC has not been verified by end-to-end F5 OAM loopback cells. AIS and RDI conditions are cleared. • Up Retry—An OAM loopback was successful. End-to-end F5 OAM loopback cells are sent at retry frequency to verify the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Verified state. • Verified—Loopbacks are successful. AIS/RDI cell was not received.
ILMI VC state	This field will have one of the following states for this VC: <ul style="list-style-type: none"> • Not Managed—VC is not being managed by ILMI. • Not Verified—VC has not been verified by ILMI. • Verified—VC has been verified by ILMI.
VC is managed by OAM/ILMI	VC is managed by OAM and/or ILMI.
InARP frequency	Number of minutes for the Inverse ARP time period.
InPkts	Total number of packets received on this virtual circuit. This number includes all fast-switched and process-switched packets.
OutPkts	Total number of packets sent on this virtual circuit. This number includes all fast-switched and process-switched packets.
InBytes	Total number of bytes received on this virtual circuit. This number includes all fast-switched and process-switched bytes.
OutBytes	Total number of bytes sent on this virtual circuit. This number includes all fast-switched and process-switched bytes.
InPRoc	Number of process-switched input packets.
OutPRoc	Number of process-switched output packets.
Broadcasts	Number of process-switched broadcast packets.
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 cells received	Total number of OAM cells received on this virtual circuit.
F5 InEndloop	Number of end-to-end F5 OAM loopback cells received.
F5 InSegloop	Number of segment F5 OAM loopback cells received.
F5 InAIS	Number of F5 OAM AIS cells received.
F5 InRDI	Number of F5 OAM RDI cells received.
F4 InEndloop	Number of end-to-end F4 OAM loopback cells received.
F4 InSegloop	Number of segment F4 OAM loopback cells received.

Table 3 Show ATM PVC Field Descriptions (Continued)

Field	Description
F4 InAIS	Number of F4 OAM AIS cells received.
F4 InRDI	Number of F4 OAM RDI cells received.
OAM cells sent	Total number of OAM cells sent on this virtual circuit.
F5 OutEndloop	Number of end-to-end F5 OAM loopback cells sent.
F5 OutSegloop	Number of segment F5 OAM loopback cells sent.
F5 OutRDI	Number of F5 OAM RDI cells sent.
OAM cell drops	Number of OAM cells dropped (or flushed).
PVC Discovery	<p>NOT_VERIFIED—This PVC is manually configured on the router and not yet verified with the attached adjacent switch.</p> <p>WELL_KNOWN—This PVC has a VCI value of 0 through 31.</p> <p>DISCOVERED—This PVC is learned from the attached adjacent switch via ILMI.</p> <p>MIXED—Some of the traffic parameters for this PVC were learned from the switch via ILMI.</p> <p>MATCHED—This PVC is manually configured on the router and the local traffic shaping parameters match the parameters learned from the switch.</p> <p>MISMATCHED—This PVC is manually configured on the router and the local traffic shaping parameters do not match the parameters learned from the switch.</p> <p>LOCAL_ONLY—This PVC is configured locally on the router and not on the remote switch.</p>
State	<p>When the Status field is UP, this field does not appear. When the Status field is DOWN or INACTIVE, the State field will appear with one of the following values:</p> <p>NOT_VERIFIED—The VC has been established successfully; Waiting for OAM (if enabled) and ILMI (if enabled) to verify that the VC is up.</p> <p>NOT_EXIST—VC has not been created.</p> <p>HASHING_IN—VC has been hashed into a hash table.</p> <p>ESTABLISHING—Ready to establish VC connection.</p> <p>MODIFYING—VC parameters have been modified.</p> <p>DELETING—VC is being deleted.</p> <p>DELETED—VC has been deleted.</p> <p>NOT_IN_SERVICE—ATM interface is shut down.</p>

show atm svc

To display all ATM SVCs and traffic information, use the **show atm svc** privileged EXEC command.

```
show atm svc [vpi/vci | name | interface atm interface_number]
```

Syntax Description

<i>vpi/vci</i>	(Optional) The ATM VPI and VCI numbers. The absence of the slash character (/) and a <i>vpi</i> value defaults the <i>vpi</i> value to 0.
<i>name</i>	(Optional) Name of the SVC.
interface atm <i>interface_number</i>	(Optional) Interface number or subinterface number of the SVC. Displays all SVCs on the specified interface or subinterface. The <i>interface_number</i> uses one of the following formats, depending on what router platform you are using: <i>slot/0</i> [<i>.subinterface-number</i> multipoint] (for the AIP on Cisco 7500 series routers and ATM port adapter on the Cisco 7200 series routers) <i>number</i> [<i>.subinterface-number</i> multipoint] (for the NPM on Cisco 4500 and 4700 routers) <i>slot/port-adapter/0</i> [<i>.subinterface-number</i> multipoint] (for the ATM port adapter on Cisco 7500 series routers) For a description of these arguments, refer to the interface atm command.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

If the *vpi/vci* or *name* is not specified, the output of this command is the same as that of the **show atm vc** command but only the configured SVCs are displayed. See the first sample output below.

If the *vpi/vci* or *name* is specified, the output of this command is the same as the **show atm vc vcd** command, plus extra information related to SVC management including connection name, detailed states, and OAM counters. See the second sample output below.

If the **interface atm** *interface-number* option is included in the command, all SVCs under that interface or subinterface are displayed. See the third sample output below.

Sample Display

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

```
Router# show atm svc

Interface      VCD/          Peak   Avg/Min   Burst
Name          VPI  VCI  Type  Encaps  Kbps   Kbps     Cells  Sts
2/0.2         4      0   32   SVC   SNAP   155000 155000     UP
2/0.2         3      0   33   SVC   SNAP   155000 155000     UP
2/0.1         5      0   34   SVC   SNAP   155000         UP
2/0.2         6      0   35   SVC   SNAP   155000 155000     UP
```

The following is sample output from the **show atm svc** command with VPI 0 and VCI 34 specified:

```
Router# show atm svc 0/34

ATM2/0.1: VCD: 5, VPI: 0, VCI: 34
UBR, PeakRate: 155000
AAL5-LLC/SNAP, etype: 0x0, Flags 0x440, VCmode: 0xE000
OAM frequency: 0 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
ILMI VC state: Not Managed
InARP DISABLED
InPkts: 4, OutPkts: 4, InBytes: 432, OutBytes: 432
InPRoc: 4, OutPRoc: 4, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI:0
F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI:0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0, F5 OutRDI: 0
OAM cell drops: 0
Status: UP
TTL: 3
interface = ATM2/0.2, call locally initiated, call reference = 8388610
vcnum = 5, vpi = 0, vci = 34, state = Active(U10), point-to-point call
Retry count: Current = 0
timer currently inactive, timer value = 00:00:00
Remote Atm Nsap address:47.00918100000000400B0A2501.0060837B4743.00, VCowner:Static Map
```

The following is sample output from the **show atm svc interface atm interface_number** command:

```
Router# show atm svc interface atm 2/0.2

Interface      VCD          Peak   Avg/Min   Burst
Name          VPI  VCI  Type  Encaps  Kbps   Kbps     Cells  Sts
2/0.2         4      0   32   SVC   SNAP   155000 155000     UP
2/0.2         3      0   33   SVC   SNAP   155000 155000     UP
2/0.2         6      0   35   SVC   SNAP   155000 155000     UP
```

Table 4 describes significant fields shown in the displays.

Table 4 Show ATM SVC Field Descriptions

Field	Description
Interface	Interface and subinterface slot and port.
VCD/Name	Virtual circuit descriptor (virtual circuit number). The connection name is displayed if a name for the VC was configured using the svc command.
VPI	Virtual path identifier.

Table 4 Show ATM SVC Field Descriptions (Continued)

Field	Description
VCI	Virtual channel identifier.
Type	Type of virtual circuit, either 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.
Encaps	Type of ATM adaptation layer (AAL) and encapsulation.
Peak	Kilobits per second transmitted at the peak rate.
or	
PeakRate	
Avg/Min	Kilobits per second transmitted at the average rate.
or	
Average Rate	
Burst Cells	Value that equals the maximum number of ATM cells the virtual circuit can transmit at peak rate.
Sts or Status	Status of the VC connection. <ul style="list-style-type: none"> • UP indicates that the connection is enabled for data traffic. • DOWN indicates that the connection is not ready for data traffic. When the Status field is DOWN, a State field is shown. See a description of the different values for this field listed later in this table. • INACTIVE indicates that the interface is down.
Connection Name	The name of the SVC.
UBR, UBR+, or VBR-NRT	UBR—Unspecified Bit Rate QOS is specified for this SVC. See the ubr command for further information. UBR+—Unspecified Bit Rate QOS is specified for this SVC. See the ubr+ command for further information. VBR-NRT—Variable Bit Rate-Non Real Time QOS rates are specified for this SVC. See the vbr-nrt command for further information.
etype	Encapsulation type.

Table 4 Show ATM SVC Field Descriptions (Continued)

Field	Description
Flags	<p>Bit mask describing virtual circuit information. The flag values are summed to result in the displayed value.</p> <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>0x9—AAL5-CISCOPPP</p>
VCmode	<p>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.</p>
OAM frequency	<p>Number of seconds between sending OAM loopback cells.</p>
OAM retry frequency	<p>The frequency (in seconds) that end-to-end F5 loopback cells should be transmitted when a change in UP/DOWN state is being verified. For example, if an SVC is up and a loopback cell response is not received after the <i>frequency</i> (in seconds) specified using the oam-svc command, then loopback cells are sent at the <i>retry-frequency</i> to verify whether or not the SVC is down.</p>
OAM up retry count	<p>Number of consecutive end-to-end F5 OAM loopback cell responses that must be received in order to change a PVC state to up. Does not apply to SVCs.</p>
OAM down retry count	<p>Number of consecutive end-to-end F5 OAM loopback cell responses that are not received in order to change a PVC state to down or tear down an SVC.</p>
OAM Loopback status	<p>Status of end-to-end F5 OAM loopback cell generation for this VC. This field will have one of the following values:</p> <ul style="list-style-type: none"> • OAM Disabled—End-to-End F5 OAM loopback cell generation is disabled. • OAM Sent—OAM cell was sent. • OAM Received—OAM cell was received. • OAM Failed—OAM reply was not received within the frequency period or contained bad correlation tag.ssss

Table 4 Show ATM SVC Field Descriptions (Continued)

Field	Description
OAM VC state	This field will have one of the following states for this VC: <ul style="list-style-type: none"> • AIS/RDI—The VC received AIS/RDI cells. End-to-end F5 OAM loopback cells are not sent in this state. • Down Retry—An OAM loopback failed. End-to-end F5 OAM loopback cells are sent at retry frequency to verify the VC is really down. After down-count unsuccessful retries, the VC goes to the Not Verified state. • Not Managed—VC is not being managed by OAM. • Not Verified—VC has not been verified by end-to-end F5 OAM loopback cells. AIS and RDI conditions are cleared. • Up Retry—An OAM loopback was successful. End-to-end F5 OAM loopback cells are sent at retry frequency to verify the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Verified state. • Verified—Loopbacks are successful. AIS/RDI cell was not received.
ILMI VC state	This field will have one of the following states for this VC: <ul style="list-style-type: none"> • Not Managed—VC is not being managed by ILMI. • Not Verified—VC has not been verified by ILMI. • Verified—VC has been verified by ILMI.
VC is managed by OAM/ILMI	VC is managed by OAM and/or ILMI.
InARP frequency	Number of minutes for the Inverse ARP time period.
InPkts	Total number of packets received on this virtual circuit. This number includes all fast-switched and process-switched packets.
OutPkts	Total number of packets sent on this virtual circuit. This number includes all fast-switched and process-switched packets.
InBytes	Total number of bytes received on this virtual circuit. This number includes all fast-switched and process-switched bytes.
OutBytes	Total number of bytes sent on this virtual circuit. This number includes all fast-switched and process-switched bytes.
InPRoc	Number of process-switched input packets.
OutPRoc	Number of process-switched output packets.
Broadcasts	Number of process-switched broadcast packets.
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 cells received	Total number of OAM cells received on this virtual circuit.
F5 InEndloop	Number of end-to-end F5 OAM loopback cells received.
F5 InSegloop	Number of segment F5 OAM loopback cells received.
F5 InAIS	Number of F5 OAM AIS cells received.
F5 InRDI	Number of F5 OAM RDI cells received.
F4 InEndloop	Number of end-to-end F4 OAM loopback cells received.
F4 InSegloop	Number of segment F4 OAM loopback cells received.

Table 4 Show ATM SVC Field Descriptions (Continued)

Field	Description
F4 InAIS	Number of F4 OAM AIS cells received.
F4 InRDI	Number of F4 OAM RDI cells received.
OAM cells sent	Total number of OAM cells sent on this virtual circuit.
F5 OutEndloop	Number of end-to-end F5 OAM loopback cells sent.
F5 OutSegloop	Number of segment F5 OAM loopback cells sent.
F5 OutRDI	Number of F5 OAM RDI cells sent.
OAM cell drops	Number of OAM cells dropped (or flushed).
State	<p>When the Status field is DOWN or INACTIVE, the State field will appear with one of the following values:</p> <p>NOT_VERIFIED—The VC has been established successfully; Waiting for OAM (if enabled) and ILMI (if enabled) to verify that the VC is up.</p> <p>NOT_EXIST—VC has not been created.</p> <p>HASHING_IN—VC has been hashed into a hash table.</p> <p>ESTABLISHING—Ready to establish VC connection.</p> <p>MODIFYING—VC parameters have been modified.</p> <p>DELETING—VC is being deleted.</p> <p>DELETED—VC has been deleted.</p> <p>NOT_IN_SERVICE—ATM interface is shut down.</p>
TTL	Time-to-live in ATM hops across the VC.
VC owner	IP Multicast address of group.

show atm traffic

To display current, global ATM traffic information to and from all ATM networks connected to the router and detailed OAM statistics, 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

276875 Input packets
272965 Output packets
2 Broadcast packets
0 Packets received on non-existent VC
6 Packets attempted to send on non-existent VC
272523 OAM cells received
F5 InEndloop: 272523, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI: 0
272963 OAM cells sent
F5 OutEndloop: 272963, F5 OutSegloop: 0, F5 OutRDI: 0
0 OAM cell drops
```

Table 5 describes the fields shown in the display.

Table 5 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 received on non-existent VC	Number of packets sent to virtual circuits not configured.
Packets attempted to send on non-existent VC	Number of packets attempted to send on non-existent VC.
OAM cells received	Total number of OAM loopback cells received.
F5 InEndloop	Number of end-to-end F5 OAM loopback cells received.
F5 InSegloop	Number of segment F5 OAM loopback cells received.
F5 InAIS	Number of F5 OAM AIS cells received.
F5 InRDI	Number of F5 OAM RDI cells received.
F4 InEndloop	Number of end-to-end F4 OAM loopback cells received.

Table 5 Show ATM Traffic Field Descriptions (Continued)

Field	Description
F4 InSegloop	Number of segment F4 OAM loopback cells received.
F4 InAIS	Number of F4 OAM AIS cells received.
F4 InRDI	Number of F4 OAM RDI cells received.
OAM cells sent	Total number of OAM cells sent on this VC.
F5 OutEndloop	Number of end-to-end F5 OAM loopback cells sent.
F5OutSegloop	Number of segment F5 OAM loopback cells sent.
F5 OutRDI	Number of F5 OAM RDI cells sent.
OAM cell drops	Number of OAM cells dropped (or flushed).

Related Commands

pvc

svc

show atm vc

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

show atm vc [*vcd* | **interface** *interface-number*]

Syntax Description

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

interface *interface-number* (Optional) Interface number or subinterface number of the PVC or SVC. Displays all PVCs and SVCs on the specified interface or subinterface.

The *interface_number* uses one of the following formats, depending on what router platform you are using:

slot/**0**[*.subinterface-number multipoint*] (for the AIP on Cisco 7500 series routers and ATM port adapter on the Cisco 7200 series routers)

number[*.subinterface-number multipoint*] (for the NPM on Cisco 4500 and 4700 routers)

slot/port-adapter/**0**[*.subinterface-number multipoint*] (for the ATM port adapter on Cisco 7500 series routers)

For a description of these arguments, refer to the **interface atm** command.

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
```

Interface	VCD/ Name	VPI	VCI	Type	Encaps	Peak Kbps	Avg/Min Kbps	Burst Cells	Sts
4/0.1	1	1	1	PVC	SAAL	155000	155000	0	UP
4/0	2	2	2	PVC	ILMI	155000	155000	0	UP
4/0	3	3	3	PVC	SNAP	155000	155000	0	UP
4/0	4	4	4	PVC	SNAP	155000	155000	0	UP
4/0	5	5	5	PVC	SNAP	155000	155000	0	UP
4/0	6	6	6	PVC	SNAP	1000		0	UP

```
4/0      7      7      7      PVC  SNAP      0      0      0      UP
```

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
PeakRate: 155000, Average Rate: 155000, Burst Cells: 0
AAL5-LLC/SNAP, etype:0x0, Flags: 0x30, VCmode: 0xE000
OAM frequency: 0 second(s)
InARP frequency: 1 minute(s)
InPkts: 181061, OutPkts: 570499, InBytes: 757314267, OutBytes: 2137187609
InPRoc: 181011, OutPRoc: 10, Broadcasts: 570459
InFast: 39, OutFast: 36, InAS: 11, OutAS: 6
OAM cells received: 0
OAM cells sent: 0
Status: UP
```

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
PeakRate: 0, Average Rate: 0, Burst Cells: 0
AAL3/4-SMDS, etype:0x1, Flags: 0x35, 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 a *vcd* value is specified and generation of end-to-end F5 OAM loopback cells has been enabled:

```
Router# show atm vc 7

ATM4/0: VCD: 7, VPI: 7, VCI: 7
PeakRate: 0, Average Rate: 0, Burst Cells: 0
AAL5-LLC/SNAP, etype:0x0, Flags: 0x30, VCmode: 0xE000
OAM frequency: 10 second(s)
InARP DISABLED
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc: 0, Broadcasts: 0
InFast:0, OutFast:0, InAS:0, OutAS:0
OAM cells received: 0
OAM cells sent: 1
Status: UP
```

The following is sample output from the **show atm vc** command when a *vcd* value is specified, and there is an incoming multipoint virtual circuit:

```
Router# show atm vc 3

ATM2/0: VCD: 3, VPI: 0, VCI: 33
PeakRate: 0, Average Rate: 0, Burst Cells: 0
AAL5-MUX, etype:0x809B, Flags: 0x53, 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 when a *vcd* value is specified, and there is an outgoing multipoint virtual circuit:

```

Router# show atm vc 6
ATM2/0: VCD: 6, VPI: 0, VCI: 35
PeakRate: 0, Average Rate: 0, Burst Cells: 0
AAL5-MUX, etype:0x800, Flags: 0x53, 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
vcnum = 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 when a *vcd* value is specified, and there is a PPP-over-ATM connection:

```

Router# show atm vc 1
ATM8/0.1: VCD: 1, VPI: 41, VCI: 41
PeakRate: 155000, Average Rate: 155000, Burst Cells: 96
AAL5-CISCOPPP, etype:0x9, Flags: 0xC38, 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 cells received: 0
OAM cells sent: 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/ Name	VPI	VCI	Type	Encaps	Peak Kbps	Avg/Min Kbps	Burst Cells	Sts
0/0	1	0	5	PVC	SAAL	155000	155000	96	UP
0/0	2	0	16	PVC	ILMI	155000	155000	96	UP
0/0	3	0	124	MSVC-3	SNAP	155000	155000	96	UP
0/0	4	0	125	MSVC	SNAP	155000	155000	96	UP
0/0	5	0	126	MSVC	SNAP	155000	155000	96	UP
0/0	6	0	127	MSVC	SNAP	155000	155000	96	UP
0/0	9	0	130	MSVC	SNAP	155000	155000	96	UP
0/0	10	0	131	SVC	SNAP	155000	155000	96	UP
0/0	11	0	132	MSVC-3	SNAP	155000	155000	96	UP
0/0	12	0	133	MSVC-1	SNAP	155000	155000	96	UP
0/0	13	0	134	SVC	SNAP	155000	155000	96	UP
0/0	14	0	125	MSVC-2	SNAP	155000	155000	96	UP
0/0	15	0	136	MSVC-2	SNAP	155000	155000	96	UP

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
PeakRate: 155000, Average Rate: 155000, Burst Cells: 96
AAL5-LLC/SNAP, etype:0x0, Flags: 0x650, 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 cells received: 0
OAM cells sent: 0
Status: ACTIVE, TTL: 2, VC owner: IP Multicast (224.1.1.1) <<<
interface = ATM0/0, call locally initiated, call reference = 2
vcnum = 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 6 describes the fields shown in the displays.

Table 6 Show ATM VC Field Descriptions

Field	Description
Interface	Interface slot and port.
VCD/Name	Virtual circuit descriptor (virtual circuit number). The connection name is displayed if the VC was configured using the pvc command and the name was specified.
VPI	Virtual path identifier.
VCI	Virtual channel identifier.
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. Type of PVC detected from PVC discovery, either PVC-D, PVC-L, or PVC-M. <ul style="list-style-type: none"> PVC-D indicates a PVC created due to PVC discovery. PVC-L indicates that the corresponding peer of this PVC could not be found on the switch. PVC-M indicates that some or all of the QOS parameters of this PVC mismatch that of the corresponding peer on the switch.
Encaps	Type of ATM adaptation layer (AAL) and encapsulation.
PeakRate	Kilobits per second transmitted at the peak rate.
Average Rate	Kilobits per second transmitted at the average rate.
Burst Cells	Value that equals the maximum number of ATM cells the virtual circuit can transmit at peak rate.

Table 6 Show ATM VC Field Descriptions (Continued)

Field	Description
Status	Status of the VC connection. <ul style="list-style-type: none"> • UP indicates that the connection is enabled for data traffic. • DOWN indicates that the connection is not ready for data traffic. When the Status field is DOWN, a State field is shown. See a description of the different values for this field listed later in this table. • INACTIVE indicates that the interface is down.
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.
etype	Encapsulation type.
Flags	Bit mask describing virtual circuit information. The flag values are summed to result in the displayed value. <ul style="list-style-type: none"> 0x40—SVC 0x20—PVC 0x10—ACTIVE 0x0—AAL5-SNAP 0x1—AAL5-NLPID 0x2—AAL5-FRNLPID 0x3—AAL5-MUX 0x4—AAL3/4-SMDS 0x5—QSAAL 0x6—ILMI 0x7—AAL5-LANE 0x9—AAL5-CISCOPPP
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 fast-switched and process-switched packets.
OutPkts	Total number of packets sent on this virtual circuit. This number includes all fast-switched and process-switched packets.
InBytes	Total number of bytes received on this virtual circuit. This number includes all fast-switched and process-switched bytes.
OutBytes	Total number of bytes sent on this virtual circuit. This number includes all fast-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.
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 loopback cells are sent every 10 seconds.

Table 6 Show ATM VC Field Descriptions (Continued)

Field	Description
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**atm-nsap****atm pvc****map-list**

SVC

To create an ATM SVC and specify the destination NSAP address on a main interface or subinterface, use the **svc** interface configuration command. To disable the SVC, use the **no** form of this command.

```
svc [name] nsap address  
no svc [name] nsap address
```

Syntax Description

<i>name</i>	(Optional) The name of the SVC and map. The name can be up to 16 characters long.
nsap <i>address</i>	The destination ATM NSAP address. Must be exactly 40 hexadecimal digits long and in the correct format. See the “Usage Guidelines” section below.

Default

No NSAP address is defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Once you specify a *name* for an SVC, you can reenter the interface-ATM-VC configuration mode by simply entering **svc name**. You can remove an NSAP address any associated parameters by entering **no svc name** or **no svc nsap address**.

Note After configuring the parameters for an ATM SVC, you must exit the interface-ATM-VC configuration mode in order to enable the SVC settings.

Example

The following example creates an SVC with the name lion and specifies the 40-digit hexadecimal destination ATM NSAP address:

```
svc lion nsap 47.0091.81.000000.0040.0B0A.2501.ABC1.3333.3333.05
```

ubr

To select Unspecified Bit Rate (UBR) QOS and configure the output peak cell rate for an ATM PVC, SVC, or VC class, use the **ubr** command in the appropriate command mode. Use the **no** form of this command to remove the UBR parameter.

```
ubr output-pcr [input-pcr]
no ubr output-pcr [input-pcr]
```

Syntax Description

<i>output-pcr</i>	The output peak cell rate in kilobits per second.
<i>input-pcr</i>	(Optional for SVCs only) The input peak cell rate in kilobits per second. If this value is omitted, the <i>input-pcr</i> will equal the <i>output-pcr</i> .

Default

UBR QOS at the maximum line rate of the physical interface.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

To configure ATM SVCs with an output peak cell rate and an input peak cell rate that differ from each other, you must expressly configure an output value and an input value using the *output-pcr* and *input-pcr* arguments, respectively.

Configure QOS parameters using the **ubr**, **ubr+** or **vbr-nrt** command. The last command you enter will apply to the PVC or SVC you are configuring.

If the **ubr** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC or SVC itself.
- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC's or SVC's ATM subinterface.
- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC's or SVC's ATM main interface.
- Global default: UBR QOS at the maximum line rate of the PVC or SVC.

Example

The following example specifies the *output-pcr* for an ATM PVC to be 100,000 Kbps:

```
pvc 1/32  
ubr 100000
```

The following example specifies the *output-pcr* and *input-pcr* for an ATM SVC to be 10,000 Kbps and 9000 Kbps, respectively:

```
svc lion nsap 47.0091.81.000000.0040.0B0A.2501.ABC1.3333.3333.05  
ubr 10000 9000
```

Related Commands

ubr+

vbr-nrt

ubr+

To select Unspecified Bit Rate (UBR) QOS and configure the output peak cell rate and output minimum guaranteed cell rate for an ATM PVC, SVC, or VC class, use the **ubr+** command in the appropriate command mode. Use the **no** form of this command to remove the UBR+ parameters.

```
ubr+ output-pcr output-mcr [input-pcr] [input-mcr]
no ubr+ output-pcr output-mcr [input-pcr] [input-mcr]
```

Syntax Description

<i>output-pcr</i>	The output peak cell rate in kilobits per second.
<i>output-mcr</i>	The output minimum guaranteed cell rate in kilobits per second.
<i>input-pcr</i>	(Optional for SVCs only) The input peak cell rate in kilobits per second. If this value is omitted, the <i>input-pcr</i> will equal the <i>output-pcr</i> .
<i>input-mcr</i>	(Optional for SVCs only) The input minimum guaranteed cell rate in kilobits per second. If this value is omitted, the <i>input-mcr</i> will equal the <i>output-mcr</i> .

Default

UBR QOS at the maximum line rate of the physical interface.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

To configure ATM SVCs with an output rate and input rates that differ from each other, you must expressly configure output values and input values using the *output-pcr*, *output-mcr*, *input-pcr*, and *input-mcr* arguments, respectively.

Configure QOS parameters using the **ubr**, **ubr+** or **vbr-nrt** command. The last command you enter will apply to the PVC or SVC you are configuring.

If the **ubr+** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC or SVC itself.
- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC's or SVC's ATM subinterface.
- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC's or SVC's ATM main interface.
- Global default value: UBR QOS at the maximum line rate of the PVC or SVC.

Example

The following example specifies the *output-pcr* to be 100,000 Kbps and the *output-mcr* to be 3000 Kbps for an ATM PVC:

```
pvc 1/32
ubr+ 100000 3000
```

The following example specifies the *output-pcr*, *output-mcr*, *input-pcr*, and *input-mcr* for an ATM SVC to be 10,000 Kbps, 3000 Kbps, 9000 Kbps, and 1000 Kbps, respectively:

```
svc lion nsap 47.0091.81.000000.0040.0B0A.2501.ABC1.3333.3333.05
ubr+ 10000 3000 9000 1000
```

Related Commands

ubr
vbr-nrt

vbr-nrt

To select Variable Bit Rate-Non Real Time (VBR-NRT) QOS and specify output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, or VC class, use the **vbr-nrt** command in the appropriate command mode. Use the **no** form of this command to remove the VBR-NRT parameters.

```
vbr-nrt output-pcr output-scr output-mbs [input-pcr] [input-scr] [input-mbs]
no vbr-nrt output-pcr output-scr output-mbs [input-pcr] [input-scr] [input-mbs]
```

Syntax Description

<i>output-pcr</i>	The output peak cell rate in kilobits per second.
<i>output-scr</i>	The output sustainable cell rate in kilobits per second.
<i>output-mbs</i>	The output maximum burst cell size expressed in number of cells.
<i>input-pcr</i>	(Optional for SVCs only) The input peak cell rate in kilobits per second.
<i>input-scr</i>	(Optional for SVCs only) The input sustainable cell rate in kilobits per second.
<i>input-mbs</i>	(Optional for SVCs only) The input maximum burst cell size expressed in number of cells.

Default

UBR QOS at the maximum line rate of the physical interface.

Command Mode

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

Configure QOS parameters using the **ubr**, **ubr+** or **vbr-nrt** command. The last command you enter will apply to the PVC or SVC you are configuring.

If the **vbr-nrt** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC or SVC itself.
- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC's or SVC's ATM subinterface.
- Configuration of any QOS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC's or SVC's ATM main interface.
- Global default: UBR QOS at the maximum line rate of the PVC or SVC.

Example

The following example specifies the *output-pcr* to be 100,000 Kbps, the *output-scr* to be 50,000 Kbps, and the *output-mbs* to be 64:

```
pvc 1/32
vbr-nrt 100000 50000 64
```

The following example specifies the VBR-NRT output and input parameters for an ATM SVC:

```
svc lion nsap 47.0091.81.000000.0040.0B0A.2501.ABC1.3333.3333.05
vbr-nrt 10000 5000 32 20000 10000 64
```

Related Commands

ubr
ubr+

vc-class atm

To create a VC class for an ATM PVC, SVC, or ATM interface and enter vc-class configuration mode, use the **vc-class atm** global configuration command. Use the **no** form of this command to remove a VC class.

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

Syntax Description

name Name of your VC class.

Default

No VC class is defined.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

You can configure the following commands in a VC class:

- **broadcast**
- **encapsulation**
- **idle-timeout**
- **ilmi manage**
- **inarp**
- **oam-pvc**
- **oam retry**
- **oam-svc**
- **protocol**
- **ubr**
- **ubr+**
- **vbr-nrt**

If an SVC command (for example, the **idle-timeout** or **oam-svc** command) is applied on a PVC, the command is ignored. This is also true if a PVC command is applied to an SVC.

Example

The following example creates a VC class named pvc-qos:

```
vc-class atm pvc-qos
```

Debug Commands

This section documents new or modified debug commands related to the Enhanced ATM VC Configuration and Management feature set. All other commands used with this feature are documented in the Cisco IOS Release 11.3 command references.

- **debug atm packet**
- **debug atm pvc**

debug atm packet

Use the **debug atm packet** EXEC command to display per-packet debugging output. The output reports information online when a packet is received or a transmit is attempted. The **no** form of this command disables debugging output.

[no] **debug atm packet** [**interface atm** *number* [**vcd** *vcd-number*] | **vc** *vpi/vci* | *vc-name*]

Syntax Description

interface <i>number</i>	(Optional) ATM interface or subinterface number.
vcd <i>vcd-number</i>	(Optional) Number of the virtual circuit designator (VCD).
vc <i>vpi/vci</i>	(Optional) VPI and VCI numbers of the VC.
<i>vc-name</i>	(Optional) Name of the PVC or SVC.

Usage Guidelines

The **debug atm packet** command displays all process-level ATM packets for both outbound and inbound packets. This command is useful for determining whether packets are being received and transmitted correctly.

For transmitted packets, the information is displayed only after the protocol data unit (PDU) is entirely encapsulated and a next hop virtual circuit (VC) is found. If information is not displayed, the address translation probably failed during encapsulation. When a next hop VC is found, the packet is displayed exactly as it will be presented on the wire. Having a display indicates the packets are properly encapsulated for transmission.

For received packets, information is displayed for all incoming frames. The display can show whether the transmitting station properly encapsulates the frames. Because all incoming frames are displayed, this information is useful when performing back-to-back testing and corrupted frames cannot be dropped by an intermediary ATM switch.

The **debug atm packet** command also displays the initial bytes of the actual PDU in hexadecimal. This information can be decoded only by qualified support or engineering personnel.

Note Because the **debug atm packet** command generates a significant amount of output for every packet processed, use it only when traffic on the network is low, so other activity on the system is not adversely affected.

Sample Display

Figure 1 shows sample **debug atm packet** output.

Figure 1 Sample Debug ATM Packet Output

```
Router# debug atm packet

ATM2/0.5(I): VCD:0x9 VCI:0x23 Type:0x0 SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length0x70
4500 002E 0000 0000 0209 92ED 836C A26E FFFF FFFF 1108 006D 0001 0000 0000
A5CC 6CA2 0000 000A 0000 6411 76FF 0100 6C08 00FF FFFF 0003 E805 DCFE 0105
```

Table 7 describes significant fields shown in Figure 1.

Table 7 Debug ATM Packet Field Descriptions

Field	Description
ATM2/0.5	Indicates the subinterface that generated this packet.
(I)	Indicates a receive packet. (O) indicates an output packet.
VCD: 0xn	Indicates the virtual circuit associated with this packet, where <i>n</i> is some value.
DM: 0xnmmn	Indicates the descriptor mode bits on output only, where <i>mmmn</i> is a hexadecimal value.
TYPE: <i>n</i>	Shows the encapsulation type for this packet.
Length: <i>n</i>	Shows the total length of the packet including the ATM header(s).

The following two lines of output are the binary data, which are the contents of the protocol PDU before encapsulation at the ATM:

```
4500 002E 0000 0000 0209 92ED 836C A26E FFFF FFFF 1108 006D 0001 0000 0000
A5CC 6CA2 0000 000A 0000 6411 76FF 0100 6C08 00FF FFFF 0003 E805 DCFE 0105
```

debug atm pvcd

Use the **debug atm pvcd** EXEC command to display the PVC Discovery events and ILMI MIB traffic used when discovering PVCs. The **no** form of this command disables debugging output.

[no] debug atm pvcd

Usage Guidelines

This command is primarily used by your technical support representative.

Sample Display

Figure 2 shows sample **debug atm pvcd** output.

Figure 2 Sample Debug ATM PVCD Output

```
Router# debug atm pvcd

PVCD: PVCD enabled w/ Subif
PVCD(ATM2/0): clearing event queue
PVCD: ATM2/0 Forgetting discovered PVCs...
PVCD: Removing all dynamic PVCs on ATM2/0
PVCD: Restoring MIXED PVCs w/ default parms on ATM2/0
PVCD: Marking static PVCs as UNKNWN on ATM2/0
PVCD: Marking static PVC 0/50 as UNKNWN on ATM2/0 ...
PVCD: Trying to discover PVCs on ATM2/0...
PVCD: pvcd_discoverPVCs
PVCD: pvcd_ping
PVCD: atmPortEntry.5.0 = 2
PVCD: pvcd_getPeerVccTableSize
PVCD: atmAtmLayerEntry.5.0 = 13
PVCD:end allocating VccTable size 13
PVCD: pvcd_getPeerVccTable
PVCD:***** ATM2/0: getNext on atmVccEntry = NULL TYPE/VALUE numFileds = 19 numVccs =
13
PVCD: Creating Dynamic PVC 0/33 on ATM2/0
PVCD(ATM2/0): Before atm_update_inheritance() and atm_create_pvc() VC 0/33: DYNAMIC
PVCD: After atm_create_pvc() VC 0/33: DYNAMIC0/33 on ATM2/0 : UBR PCR = -1
PVCD: Creating Dynamic PVC 0/34 on ATM2/0
PVCD(ATM2/0): Before atm_update_inheritance() and atm_create_pvc() VC 0/34: DYNAMIC
PVCD: After atm_create_pvc() VC 0/34: DYNAMIC0/34 on ATM2/0 : UBR PCR -1
PVCD: Creating Dynamic PVC 0/44 on ATM2/0
PVCD(ATM2/0): Before atm_update_inheritance() and atm_create_pvc() VC 0/44: DYNAMIC
PVCD: After atm_create_pvc() VC 0/44: DYNAMIC0/44 on ATM2/0 : UBR PCR = -1
PVCD: PVC 0/50 with INHERITED_QOSTYPE
PVCD: atm_oi_state_change ( 0/50, 1 = ILMI_VC_UP )
PVCD: Creating Dynamic PVC 0/60 on ATM2/0
PVCD(ATM2/0): Before atm_update_inheritance() and atm_create_pvc() VC 0/60: DYNAMIC
PVCD: After atm_create_pvc() VC 0/60: DYNAMIC0/60 on ATM2/0 : UBR PCR = -1
PVCD: Creating Dynamic PVC 0/80 on ATM2/0
PVCD(ATM2/0): Before atm_update_inheritance() and atm_create_pvc() VC 0/80: DYNAMIC
PVCD: After atm_create_pvc() VC 0/80: DYNAMIC0/80 on ATM2/0 : UBR PCR = -1
PVCD: Creating Dynamic PVC 0/99 on ATM2/0
```