

oam ais-rdi

To configure an ATM permanent virtual circuit (PVC) to be brought down after a specified number of Operation, Administration, and Maintenance (OAM) alarm indication signal/remote defect indication (AIS/RDI) cells have been received on the PVC or brought up if no OAM AIS/RDI cells have been received in a specified interval, use the **oam ais-rdi** command in ATM VC configuration or VC class configuration mode. To return OAM AIS/RDI behavior to the default, use the **no** form of this command.

oam ais-rdi [*down-count* [*up-count*]]

no oam ais-rdi [*down-count* [*up-count*]]

Syntax Description	<i>down-count</i>	(Optional) Number of consecutive OAM AIS/RDI cells received before the PVC is brought down. The range is from 1 to 60. The default is 1.
	<i>up-count</i>	(Optional) Number of seconds after which a PVC will be brought up if no OAM AIS/RDI cells are received. The range is from 3 to 60. The default is 3.

Defaults	Down count: 1 Up count: 3
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Command Modes	ATM VC configuration VC class configuration
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Command History	Release	Modification
	12.1(2)T	This command was introduced.

Usage Guidelines	<p>The default values for the OAM AIS/RDI down count and up count are used in the following situations:</p> <ul style="list-style-type: none"> • If the oam ais-rdi command has not been entered • If the oam ais-rdi command is entered without the <i>up-count</i> or <i>down-count</i> argument • If the no oam ais-rdi command is entered <p>If the oam ais-rdi command is entered without the <i>up-count</i> or <i>down-count</i> argument, the command will not appear in the show running-config command output.</p>
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Examples	<p>In the following example, PVC 0/400 will be brought down after 25 consecutive OAM AIS/RDI cells have been received on the PVC. The PVC will be brought up when no OAM AIS/RDI cells have been received for 5 seconds.</p>
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```
interface ATM2/0/0
 ip address 172.2.222.20 255.255.255.0
 no ip route-cache cef
 no ip route-cache distributed
 no atm ilmi-keepalive
 pvc 0/400
```

```
protocol ip 172.2.223.21
oam-pvc manage 30
oam ais-rdi 25 5
```

oam-pvc

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

oam-pvc [**manage**] [*frequency*]

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

Syntax Description	manage	(Optional) Enable OAM management.
	<i>frequency</i>	(Optional) Time delay (0 to 600 seconds) between transmitting OAM loopback cells.

Defaults	10 seconds
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Command Modes	Interface-ATM-VC configuration (for an ATM PVC)
	VC-class configuration (for a VC class)
	PVC-in-range configuration (for an individual PVC within a PVC range)

Command History	Release	Modification
	11.3	This command was introduced.
	12.1(5)T	This command was made available in PVC-in-range configuration mode.

Usage Guidelines	If OAM management is enabled, further control of OAM management is configured using the oam retry command.
	<p>If the oam-pvc command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of precedence):</p> <ul style="list-style-type: none"> • 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 <i>frequency</i> argument is 10 seconds.

Examples	<p>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:</p> <pre>oam-pvc manage 3</pre>
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Related Commands	Command	Description
	ilmi manage	Enables ILMI management on an ATM PVC.
	oam retry	Configures parameters related to OAM management for ATM PVC, SVC, or VC class.

oam retry

To configure parameters related to Operation, Administration, and Maintenance (OAM) management for an ATM permanent virtual circuit (PVC), switched virtual circuit (SVC), VC class, or VC bundle, use the **oam retry** command in the appropriate command mode. To remove OAM management parameters, use the **no** form of this command.

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 the 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) argument is specified using the oam-pvc command, then loopback cells are sent at the <i>retry-frequency</i> to verify whether the PVC is down.

Defaults

up-count = 3

down-count = 5

retry-frequency = 1 second

This set of defaults assumes that OAM management is enabled using the **oam-pvc** or **oam-svc** command.

Command Modes

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

VC-class configuration (for a VC class)

Bundle configuration mode (for a VC bundle)

PVC range configuration (for an ATM PVC range)

PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3 T	This command was introduced.
12.0(3)T	This command allows you to configure parameters related to OAM management for ATM VC bundles.
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.

Usage Guidelines

The *up-count* argument does not apply to SVCs.

If the **oam retry** command is not explicitly configured on an ATM PVC, SVC, or VC bundle, the VC inherits the following default configuration (listed in order of 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 set of defaults 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.

To use this command in bundle configuration mode, enter the bundle command to create the bundle or to specify an existing bundle before you enter this command.

If you use the **oam retry** command to configure a VC bundle, you configure all VC members of that bundle. VCs in a VC bundle are further subject to the following inheritance rules (listed in order of precedence):

- VC configuration in bundle-vc mode
- Bundle configuration in bundle mode (with effect of assigned VC-class configuration)
- Subinterface configuration in subinterface mode

Examples

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

Command	Description
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
class-int	Assigns a VC class to an ATM main interface or subinterface.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
encapsulation	Sets the encapsulation method used by the interface.
inarp	Configures the Inverse ARP time period for an ATM PVC, VC class, or VC bundle.
oam-bundle	Enables end-to-end F5 OAM loopback cell generation and OAM management for a virtual circuit class that can be applied to a virtual circuit bundle.
oam-pvc	Enables end-to-end F5 OAM loopback cell generation and OAM management for an ATM PVC or virtual circuit class.
oam-svc	Enables end-to-end F5 OAM loopback cell generation and OAM management for an ATM SVC or virtual circuit class.

Command	Description
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).
ubr	Configures UBR QoS and specifies the output peak cell rate for an ATM PVC, SVC, VC class, or VC bundle member.
ubr+	Configures UBR QoS and specifies the output peak cell rate and output minimum guaranteed cell rate for an ATM PVC, SVC, VC class, or VC bundle member.
vbr-nrt	Configures the VBR-NRT QoS and specifies output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, VC class, or VC bundle member.

oam-svc

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

```
oam-svc [manage] [frequency]

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

Syntax Description	manage	(Optional) Enable OAM management.
	<i>frequency</i>	(Optional) Time delay (0 to 600 seconds) between transmitting OAM loopback cells.

Defaults	10 seconds
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Command Modes	Interface-ATM-VC configuration (for an ATM SVC) VC-class configuration (for a VC class)
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Command History	Release	Modification
	11.3	This command was introduced.

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

Generally, ATM signalling 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 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 *frequency* is 10 seconds.

Examples	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
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Related Commands	Command	Description
	oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, or VC class.

partial-fill

To configure the number of AAL1 user octets per cell for the ATM circuit emulation service (CES) on the OC-3/STM-1 Circuit Emulation Service network module, use the **partial-fill** interface-CES-VC command. To delete the CES partial-fill value, use the **no** form of this command.

partial-fill *octet*

no partial-fill *octet*

Syntax Description	<i>octet</i>	Number of user octets per cell for the CES. Possible values of octet range from 1 to 47.
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Defaults	No partial-fill
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Command Modes	Interface-CES-VC configuration
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Command History	Release	Modification
	12.1(2)T	This command was introduced.

Usage Guidelines	The partial-fill command applies to CES SVCs and PVCs configured on Cisco 2600 series and Cisco 3600 series routers that have OC-3/STM-1 ATM CES network modules.
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Examples	The following example sets the CES partial cell fill to 50 octets per cell for SVC “ces1”:
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```
interface atm 1/0
  svc ces1 nsap 47.00.00.....01.01.00 ces
  partial fill 40
```

Related Commands	Command	Description
	svc	Creates an ATM SVC and specifies the destination NSAP address on a main interface or subinterface.

protocol (ATM)

To configure a static map for an ATM permanent virtual circuit (PVC), switched virtual circuit (SVC), or virtual circuit (VC) class or to enable Inverse Address Resolution Protocol (ARP) or Inverse ARP broadcasts on an ATM PVC, use the **protocol** command in the appropriate mode. To remove a static map or disable Inverse ARP, use the **no** form of this command.

protocol *protocol* [*protocol-address* [**virtual-template**] | **inarp**] [[**no**] **broadcast**]

no protocol *protocol* [*protocol-address* [**virtual-template**] | **inarp**] [[**no**] **broadcast**]

Syntax Description	
<i>protocol</i>	Choose one of the following values: aarp —AppleTalk ARP appletalk —AppleTalk arp —IP ARP bridge —bridging bstun —block serial tunnel cdp —Cisco Discovery Protocol clns —ISO Connectionless Network Service (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 —packet assembler/disassembler (PAD) links ppp —Point-to-Point Protocol carried on the VC pppoe —PPP over Ethernet qllc —Qualified Logical Link Control protocol rsrb —remote source-route bridging snapshot —snapshot routing support stun —serial tunnel
<i>protocol-address</i>	Destination address that is being mapped to a PVC.
virtual-template	(Optional) Specifies parameters that the point-to-point protocol over ATM (PPoA) sessions will use.
	Note This keyword is valid only for the ppp protocol.

inarp	(Valid only for IP and IPX protocols on PVCs) Enables Inverse ARP on an ATM PVC. If you specify a <i>protocol-address</i> 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. 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.

Defaults

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

Command Modes

Interface-ATM-VC configuration (for an ATM PVC or SVC)
 VC-class configuration (for a VC class)
 PVC range configuration (for an ATM PVC range)
 PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3	This command was introduced.
12.1	The ppp and virtual-template keywords were added.
12.1(5)T	The ip and ipx options were made available in PVC range and PVC-in-range configuration modes.
12.2(13)T	The apollo , vines , and xns arguments were removed because Apollo Domain, Banyan VINES, and Xerox Network Systems are no longer supported in the Cisco IOS software.

Usage Guidelines

Command Application

Use this command to perform either of the following tasks:

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

PVC range and PVC-in-range configuration modes support only the protocols that do not require static map configuration. Those protocol options are **ip** and **ipx**.

Default Configurations

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 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 ATM subinterface of the PVC or SVC.

- Configuration of the **protocol ip inarp** or **protocol ipx inarp** command in a VC class assigned to the ATM main interface of the PVC or SVC.
- 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 10.68.34.237 is connected to this VC, and sends ATM pseudobroadcasts:

```
protocol ip 10.68.34.237 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 10.68.34.237
```

In the following example, the VC carries PPP traffic and its associated parameters.

```
protocol ppp 10.68.34.237 virtual-template
```

pvc

To create or assign a name to an ATM permanent virtual circuit (PVC), to specify the encapsulation type on an ATM PVC, and to enter interface-ATM-VC configuration mode, use the **pvc** command in interface or subinterface configuration mode. To remove an ATM PVC, use the **no** form of this command.

pvc [*name*] *vpi/vci* [**ces** | **ilmi** | **qsaal** | **smds**]

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

Syntax Description	
<i>name</i>	(Optional) The name of the PVC or map. The name can be up to 15 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>The range of valid values is 0 to 255 except for the following routers:</p> <ul style="list-style-type: none"> Cisco 4500 and 4700 routers: range is from 0 to 1 less than the quotient of 8192 divided by the value set by the atm vc-per-vp command Cisco 2600 and 3600 series routers using Inverse Multiplexing for ATM (IMA): ranges are 0 to 15, 64 to 79, 128 to 143, and 192 to 207 <p>A value that is out of range is interpreted as a string and is treated as the connection ID.</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 signalling, 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>A value that is out of range causes an “unrecognized command” error message.</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>
ces	(Optional) Circuit Emulation Service encapsulation. This keyword is available on the OC-3/STM-1 ATM Circuit Emulation Service network module only.
ilmi	(Optional) Used to set up communication with the Interim Local Management Interface (ILMI); the associated <i>vpi</i> and <i>vci</i> values ordinarily are 0 and 16, respectively.

qsaal	(Optional) A signalling-type PVC used for setting up or tearing down SVCs; the associated <i>vpi</i> and <i>vci</i> values ordinarily are 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.

Defaults

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

Command Modes

Interface or subinterface configuration

Command History

Release	Modification
11.3 T	This command was introduced.
12.1(2)T	The following modifications were made: <ul style="list-style-type: none"> The ranges for the VPI were increased for Cisco 2600 and Cisco 3600 series routers using IMA. The ces keyword was added for configuring CES encapsulation when using the OC-3/STM-1 ATM Circuit Emulation Service network module on Cisco 2600 and Cisco 3600 series routers.

Usage Guidelines

Creating and Configuring PVCs

The **pvc** command replaces the **atm pvc** command, which, although still supported and available, will become obsolete in the near future. Use the **pvc** command to configure a single ATM VC only, not a VC that is a bundle member. We recommend that you use the **pvc** command in conjunction with the **encapsulation** and **random-detect attach** commands instead of the **atm pvc** command.

The **pvc** command creates a PVC and attaches it to the VPI and VCI specified. Both the *vpi* and *vci* arguments 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.

ATM PVC Names

Once you specify a *name* for a PVC, you can reenter interface-ATM-VC configuration mode by simply entering the **pvc name** command. 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.

Encapsulation Types on ATM PVCs

Specify CES, ILMI, QSAAL, or SMDS as the encapsulation type on an ATM PVC. (To configure other encapsulations types, see the **encapsulation** command.)

Configuring CES encapsulation on a PVC is equivalent to creating a constant bit rate (CBR) class of service.

Rate Queues

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

Default Configurations

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 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 ATM subinterface of the PVC.
- Configuration of the **encapsulation** command in a VC class assigned to the ATM main interface of the PVC.
- 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 signalling for an SVC. It specifies VPI 0 and VCI 5:

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

The following example configures the PVC called "cisco" to use class-based weighted fair queueing (CBWFQ). It attaches a policy map called "policy1" to the PVC. The classes the make up "policy1" determine the service policy for the PVC:

```
pvc cisco 0/5
 service-policy output policy1
 vbr-nrt 2000 2000
 encap aal5snap
```

Related Commands

Command	Description
atm vc-per-vp	Sets the maximum number of VCIs to support per VPI.
pvc-bundle	Adds a PVC to a bundle as a member of the bundle and enters bundle-vc configuration mode in order to configure that PVC bundle member.

retry

To configure a router to periodically attempt to bring up an active SVC connection after the initial call setup failed, use the **retry** interface-CES-VC command. To disable the retry mechanism, use the **no** form of this command.

retry *timeout_value* [*retry_limit*] [*first_retry_interval*]

no **retry**

Syntax Description	<i>timeout_value</i>	Number of seconds between attempts to bring up the connection. The range is from 1 to 86400 seconds.
	<i>retry_limit</i>	(Optional) Number of attempts the router will make to bring up the connection. The range is from 0 to 65535. The default value of 0 indicates no limit.
	<i>first_retry_interval</i>	(Optional) Number of seconds the router will wait after the first call attempt failed before trying the call again. The default is 10 seconds.

Defaults	There is no default <i>timeout_value</i> .
	The default <i>retry_limit</i> is 0.
	The default <i>first_retry_interval</i> argument is 10 seconds.

Command Modes	Interface-CES-VC configuration
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Command History	Release	Modification
	12.1(2)T	This command was introduced.

Usage Guidelines	This command is used on Cisco 2600 series and 3600 series routers that have OC-3/STM-1 ATM CES network modules.
	The retry command applies only to active SVCs.

Examples	In the following example, the router is configured to make up to 20 attempts to bring up a connection on SVC “ces1”. The interval between attempts is set at 10 seconds.
	<pre>interface atm 1/0 svc ces1 nsap 47.0091.81.000000.0040.0B0A.2501.ABC1.3333.3333.05 ces retry 10 20</pre>

Related Commands	Command	Description
	ces	Configures CES on a router port and enters CES configuration mode.
	svc	Creates an ATM SVC and specifies the destination NSAP address on a main interface or subinterface.

scrambling cell-payload

To improve data reliability by randomizing the ATM cell payload frames on Cisco 7100, 7200, or 7500 series routers, use the **scrambling cell-payload** interface configuration command. To disable scrambling, use the **no** form of this command.

scrambling cell-payload

no scrambling cell-payload

Syntax Description This command has no arguments or keywords.

Defaults No scrambling

Command Modes Interface configuration

Command History	Release	Modification
	12.0(5)XE	This command was introduced.
	12.0(7)XE1	Support for Cisco 7100 series routers added.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines Normally, you do not issue the **scrambling cell-payload** command explicitly, because the default value is sufficient. On T1 links, the default b8zs line encoding normally assures sufficient reliability. The default for E1 is hdb3.

The scrambling setting must match that of the far-end receiver.

Examples On Cisco 7100 or 7200 series routers, the following example sets the link on interface 1 on the port adapter in slot 0 to no scrambling:

```
interface atm0/1
no scrambling cell-payload
```

Related Commands	Command	Description
	scrambling-payload	Improves data reliability by randomizing the ATM cell payload frames on Cisco 2600 and 3600 series routers.

scrambling-payload

To improve data reliability by randomizing the ATM cell payload frames on Cisco 2600 or 3600 series routers, use the **scrambling-payload** interface configuration command. To disable scrambling, use the **no** form of this command.

scrambling-payload

no scrambling-payload

Syntax Description This command has no arguments or keywords.

Defaults By default, payload scrambling is on for E1 links and off for T1 links.

Command Modes Interface configuration

Command History	Release	Modification
	12.0(5)XK	This command was introduced.
	12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.

Usage Guidelines Normally, you do not issue the **scrambling-payload** command explicitly, because the default value is sufficient. On T1 links, the default B8ZS line encoding normally assures sufficient reliability.

The scrambling setting must match that of the far end.

Examples On a Cisco 2600 or 3600 series router, the following example sets the link on interface 1 on the module in slot 0 to no scrambling:

```
interface atm0/1
 no scrambling-payload
```

Related Commands	Command	Description
	scrambling cell-payload	Improves data reliability by randomizing the ATM cell payload frames on Cisco 7100, 7200, or 7500 series routers.

show atm arp-server

To display the ATM Address Resolution Protocol (ARP) server's information about one specific interface or all interfaces, use the **show atm arp-server** user EXEC command.

AIP on Cisco 7500 series with AIP; Cisco 7200 series with ATM, ATM-CES, and enhanced ATM port adapters; Cisco 2600 and 3600 series with 1-port ATM-25 network module

```
show atm arp-server [atm slot/port[.subinterface-number]]
```

Cisco 7500 series with ATM and enhanced ATM port adapters

```
show atm arp-server [atm slot/port-adapter/port .subinterface-number]
```

Cisco 4500 and 4700 series with NPM

show atm arp-server [**atm** *number*[*.subinterface-number*]]

Syntax	Description
atm slot/port	(Optional) ATM slot and port numbers. Use this format for the following platform configurations: <ul style="list-style-type: none"> AIP on Cisco 7500 series routers. ATM port adapter, ATM-CES port adapter, and enhanced ATM port adapter on Cisco 7200 series routers. 1-port ATM-25 network module on Cisco 2600 and 3600 series routers.
atm slot/port-adapter/port	(Optional) ATM slot, port adapter, and port numbers. Use this format for the ATM port adapter or enhanced ATM port adapter on Cisco 7500 series routers.
atm number	(Optional) ATM network processor module (NPM) number on Cisco 4500 and 4700 routers.
.subinterface-number	(Optional) Subinterface number.

Command Modes User EXEC

Command History	Release	Modification
	11.1	This command was introduced.

Examples

The following is sample output from the **show atm arp-server** command when no interface is specified:

```
Router# show atm arp-server
```

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

	IP Address	TTL	ATM Address
ATM1/0:			
*	4.4.4.2	19:50	ac15336602000000000000000000000000

show atm class-links

To display virtual circuit (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	<i>vpi/vci</i>	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>	Name of the VC.

Command Modes	Privileged EXEC
---------------	-----------------

Command History	Release	Modification
	11.3	This command was introduced.

Examples 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 ilmi-configuration

To display ILMI configuration information, use the **show atm ilmi-configuration** command in privileged EXEC mode.

show atm ilmi-configuration

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0	This command was introduced prior to Cisco IOS Release 12.0.

Examples The following example shows sample output for the **show atm ilmi-configuration** command:

```
Router# show atm ilmi-configuration

LECS Address(s) :
1122334455667788990011223344556677889900
```

[Table 4](#) describes the fields shown in the display.

Table 4 show atm ilmi-configuration Field Descriptions

Field	Description
LECS Address(s)	Current ATM LAN Emulation Clients (LECs) addresses.

Related Commands	Command	Description
	show atm ilmi-status	Displays ILMI-related status information.

show atm ilmi-status

To display ILMI-related status information, use the **show atm ilmi-status** command in privileged EXEC configuration mode.

show atm ilmi-status [*atm interface-number*]

Syntax Description	atm	ATM interface.
	<i>interface-number</i>	Number of the ATM interface.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0	This command was introduced in a release prior to Cisco IOS Release 12.0.

Usage Guidelines Entering the **show atm ilmi-status** command without specifying an interface will display ILMI-related status information for all of the ATM interfaces.

Examples The following example is sample output for the **show atm ilmi-status** command:

```
Router# show atm ilmi-status

Interface :ATM2/0 Interface Type :Unknown
ILMI VCC :(0, 16) ILMI Keepalive :Disabled
ILMI State:      Restarting

Interface :ATM5/0 Interface Type :Private UNI (User-side)
ILMI VCC :(0, 16) ILMI Keepalive :Disabled
ILMI State:      UpAndNormal
Peer IP Addr:    10.0.52.17      Peer IF Name:    ATM1/1/0
Peer MaxVPIbits: 8              Peer MaxVCtbits: 14
Active Prefix(s) :
47.0091.8100.0000.0040.0b0a.2501
End-System Registered Address(s) :
47.0091.8100.0000.0040.0b0a.2501.bbbb.ccdd.eeff.12 (Confirmed)
```

[Table 5](#) describes the fields shown in the display.

Table 5 *show atm ilmi-status Field Descriptions*

Field	Description
interface	ATM interface.
Interface Type	Type of ATM interface.
ILMI VCC	Number of the current ILMI VCC for the interface.
ILMI Keepalive	Status of ILMI keepalive packets.
ILMI State	Status of ILMI for the interface.
Peer IP Addr	IP address of the peer.
Peer IF Name	Name of the peer interface.
Peer Max VPIbits	Maximum number of bits allowed for VPIs on the peer interface.
Peer Max VCIbits	Maximum number of bits allowed for VCIs on the peer interface.
Active Prefix	Network prefix that is registered from the switch side and is active and valid.
End-System Registered Address(s)	Address that the router registers back to the switch. The router combines the network prefix of the switch with the end-system identifier to form the end-system registered address.

Related Commands

Command	Description
show atm ilmi-configuration	Displays ILMI configuration information.

show atm interface atm

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

Cisco 7500 series with AIP; Cisco 7200 series with ATM, ATM-CES, and enhanced ATM port adapters; Cisco 2600 and 3600 series with 1-port ATM-25 network module

show atm interface atm *slot/port*

Cisco 7500 series with ATM and enhanced ATM port adapters

show atm interface atm *slot/port-adapter/port*

Cisco 4500 and 4700 series with NPM

show atm interface atm *number*

Syntax Description		
<i>slot/port</i>	ATM slot number and port number. Use this format on the following platform configurations:	<ul style="list-style-type: none"> The AIP on Cisco 7500 series routers. The ATM port adapter, ATM-CES port adapter, or enhanced ATM port adapter on Cisco 7200 series routers. The 1-port ATM-25 network module on Cisco 2600 and 3600 series routers.
<i>slot/port-adapter/port</i>	ATM slot, port adapter, and port number. Use this format on the ATM port adapter or ATM-CES port adapter on Cisco 7500 series routers.	
<i>number</i>	NPM number for Cisco 4500 and 4700 routers.	

Command Modes	Privileged EXEC
---------------	-----------------

Command History	Release	Modification
	10.0	This command was introduced.
	11.0	The <i>number</i> argument was added.
	11.2	The <i>slot/port-adapter/port</i> arguments were added.

Examples

The following is sample output for the ATM-CES port adapter 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, VCI's 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
```

The following is sample output for the enhanced ATM port adapter to display statistics on slot 6, port 0:

```
Router# show atm interface atm 6/0
```

```
ATM interface ATM6/0
AAL enabled: AAL5, Maximum VCs: 2048, Current VCs: 3
Maximum Transmit Channels: 64
Tx buffers: 256, Rx buffers 256, Exception Queue: 32, Raw Queue: 32
VP Filter: 0x7B, VCIs per VPI: 1024, Max Datagram Size: 4496
PLIM Type: SONET - 155Mbps, TX clocking: INTERNAL
0 input, 59 output, 0 IN fast, 0 OUT fast
ABR parameters, rif: 16 rdf: 16
Config. is ACTIVE
```

Table 6 describes the fields shown in the display.

Table 6 *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 transmit and receive buffers.
Exception Queue	Number of exception buffers.
Raw Queue	Queue size.
VP Filter	Hexadecimal value of the VP filter.
VCIs per VPI	Maximum number of VCIs to support per VPI.
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 that 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.

Table 6 *show atm interface atm Field Descriptions (continued)*

Field	Description
ABR parameters, rif rdf	The amount that the cell transmission rate increases or decreases in response to flow control information from the network or destination for available bit rate (ABR) PVCs. The rate increase factor (RIF) and rate decrease factor (RDF) in this example are 16, the default.
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.
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

Command	Description
pvc	Configures the PVC interface.

show atm map

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

show atm map

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	10.0	This command was introduced.
	11.1 CA	This command was modified to include an example for the ATM-CES port adapter (PA).
	12.0(3)T	This command was modified to include display for ATM bundle maps. An ATM bundle map identifies a bundle and all of its related VCs.

Examples The following is sample output from the **show atm map** command for a bundle called san-jose (0/122, 0/123, 0/124, and 0/126 are the virtual path and virtual channel identifiers of the bundle members):

```
Router# show atm map

Map list san-jose_B_ATM1/0.52 : PERMANENT
ip 10.1.1.1. maps to bundle san-jose, 0/122, 0/123, 0/124, 0/126, ATM1/0.52, broadcast
```

The following is sample output from the **show atm map** command for an ATM-CES PA on the Cisco 7200 series router:

```
Router# show atm map

Map list alien: PERMANENT
ip 10.1.1.1 maps to VC 6
ip 10.1.1.2 maps to VC 6
```

The following is sample output from the **show atm map** command that displays information for a bundle called new-york:

```
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
Map list new-york: PERMANENT
ip 10.0.0.2 maps to bundle new-york, 0/200, 0/205, 0/210, ATM1/0.1
```

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 10.4.4.4 maps to NSAP CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12, broadcast,
aal5mux, multipoint connection up, VC 6
ip 10.4.4.6 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 10.11.11.1 maps to VC 4, VPI 0, VCI 60, ATM0.2
```

[Table 7](#) describes the fields shown in the displays.

Table 7 *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 maps to VC x</i> or <i>protocol address maps to NSAP address</i>	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).
broadcast	Indicates pseudobroadcasting.
<i>protocol address maps to VPI x, VCI x, ATM x.x</i> or <i>protocol address maps to NSAP address</i>	Name of protocol, the protocol address, the virtual path identifier (VPI) number, the virtual channel identifier (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 switched virtual circuits (SVCs) configured using the svc command).

Table 7 *show atm map Field Descriptions (continued)*

Field	Description
aal5mux	Indicates the encapsulation used, a multipoint or point-to-point VC, and the number of the virtual circuit.
multipoint connection up	Indicates that this is a multipoint VC.
VC 6	Number of the VC.
connection up	Indicates a point-to-point VC.
VPI	Virtual path identifier for the VC.
VCI	Virtual channel identifier for the VC.
ATMx.x	ATM interface or subinterface number.
Map list	Name of the bundle whose mapping information follows.
ip address maps to bundle <i>bundle-name</i> <i>vc-members</i>	IP address of bundle and VC members that belong to the bundle.

Related Commands

Command	Description
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).
pvc	Creates an ATM PVC on a main interface or subinterface; Assigns a name to an ATM PVC; Specifies ILMI, QSAAL, or SMDS as the encapsulation type on an ATM PVC; or Enters interface-ATM-VC configuration mode.
show atm bundle	Displays the bundle attributes assigned to each bundle virtual circuit member and the current working status of the virtual circuit members.
show atm bundle statistics	Displays statistics on the specified bundle.
svc	Creates an ATM SVC and specifies destination NSAP address on an interface or subinterface.

show atm pvc

To display all ATM permanent virtual connections (PVCs) and traffic information, use the **show atm pvc** privileged EXEC command.

show atm pvc [*vpi/vci* | *name* | **interface atm** *interface-number*][**ppp**]

Syntax Description	
<i>vpi/vci</i>	(Optional) The ATM virtual path identifier (VPI) and virtual channel identifier (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> argument uses one of the following formats, depending on which router platform you are using: <ul style="list-style-type: none"> For the ATM Interface Processor (AIP) on Cisco 7500 series routers; for the ATM port adapter, ATM-CES port adapter, and enhanced ATM port adapter on Cisco 7200 series routers; for the 1-port ATM-25 network module on Cisco 2600 and 3600 series routers: <i>slot/0[.subinterface-number multipoint]</i> For the ATM port adapter and enhanced ATM port adapter on Cisco 7500 series routers: <i>slot/port-adapter/0[.subinterface-number multipoint]</i> For the NPM on Cisco 4500 and 4700 routers: <i>number[.subinterface-number multipoint]</i> For a description of these arguments, refer to the interface atm command.
ppp	(Optional) Displays each PVC configured for PPP over ATM.

Command Modes	Privileged EXEC
---------------	-----------------

Command History	Release	Modification
	11.3T	This command was introduced.
	12.1(1)T	This command was modified to display PPPoE status.

Usage Guidelines	<p>If the <i>vpi/vci</i> or <i>name</i> argument 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 in the “Examples” section.</p> <p>If the <i>vpi/vci</i> or <i>name</i> argument is specified, the output of this command is the same as the show atm vc vcd command, with extra information related to PVC management including connection name, detailed states, and Operation, Administration, and Maintenance (OAM) counters. See the second and third sample output in the “Examples” section.</p>
------------------	--

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 in the “Examples” section.

Examples

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* argument specified:

```
Router# show atm pvc 0/41
```

```
ATM2/0: VCD: 3, VPI: 0, VCI: 41
UBR, PeakRate: 155000
AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x0
OAM frequency: 0 second(s), OAM retry frequency: 1 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 frequency: 15 minutes(s)
InPkts: 31759, OutPkts: 26497, InBytes: 2356434, OutBytes: 1589743
InPRoc: 15785, OutPRoc: 26472, Broadcasts: 0
InFast: 20, OutFast: 20, InAS: 15954, OutAS: 6
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
F4 OutEndloop: 0, F4 OutSegloop: 0, F4 OutRDI: 0
OAM cell drops: 0
Status: UP
PPPOE enabled.
```

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 8](#) describes significant fields shown in the displays.

Table 8 *show atm pvc Field Descriptions*

Field	Description
Interface	Interface and subinterface slot and port.
VCD/Name	Virtual connection descriptor (virtual connection 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.
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 sent at the peak rate.
Avg/Min or Average Rate	Kilobits per second sent at the average rate.
Burst Cells	Value that equals the maximum number of ATM cells the VC can send 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	<ul style="list-style-type: none"> 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 8 *show atm pvc Field Descriptions (continued)*

Field	Description
Flags	<p>Bit mask describing VC information. The flag values are summed to result in the displayed value:</p> <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.
VCmode	AIP-specific or NPM-specific register describing the usage of the VC. 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 sent 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 value of the <i>frequency</i> argument (in seconds) specified using the oam-pvc command, then loopback cells are sent at the value of the <i>retry-frequency</i> argument to verify whether 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	<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 8 *show atm pvc Field Descriptions (continued)*

Field	Description
OAM VC state	<p>This field will have one of the following states for this VC:</p> <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 that 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	<p>This field will have one of the following states for this VC:</p> <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 or ILMI.
InARP frequency	Number of minutes for the Inverse Address Resolution Protocol (IARP) time period.
InPkts	Total number of packets received on this VC. This number includes all fast-switched and process-switched packets.
OutPkts	Total number of packets sent on this VC. This number includes all fast-switched and process-switched packets.
InBytes	Total number of bytes received on this VC. This number includes all fast-switched and process-switched bytes.
OutBytes	Total number of bytes sent on this VC. 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 VC.
F5 InEndloop	Number of end-to-end F5 OAM loopback cells received.

Table 8 *show atm pvc Field Descriptions (continued)*

Field	Description
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.
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.
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	<ul style="list-style-type: none"> • NOT_VERIFIED—This PVC is manually configured on the router and not yet verified with the attached adjacent switch. • WELL_KNOWN—This PVC has a VCI value of 0 through 31. • DISCOVERED—This PVC is learned from the attached adjacent switch via ILMI. • MIXED—Some of the traffic parameters for this PVC were learned from the switch via ILMI. • MATCHED—This PVC is manually configured on the router, and the local traffic shaping parameters match the parameters learned from the switch. • MISMATCHED—This PVC is manually configured on the router, and the local traffic shaping parameters do not match the parameters learned from the switch. • LOCAL_ONLY—This PVC is configured locally on the router and not on the remote switch.
Status	When the Status field indicates UP, the VC is established. When the Status field indicates DOWN, refer to the State field for further information about the VC state.

Table 8 *show atm pvc Field Descriptions (continued)*

Field	Description
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> <ul style="list-style-type: none"> • NOT_VERIFIED—The VC has been established successfully; waiting for OAM (if enabled) and ILMI (if enabled) to verify that the VC is up. • NOT_EXIST—VC has not been created. • HASHING_IN—VC has been hashed into a hash table. • ESTABLISHING—Ready to establish VC connection. • MODIFYING—VC parameters have been modified. • DELETING—VC is being deleted. • DELETED—VC has been deleted. • NOT_IN_SERVICE—ATM interface is shut down.
PPP:	For PPP over ATM, indicates the virtual access interface number and virtual template number being used.

show atm svc

To display all ATM switched virtual circuits (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> argument uses one of the following formats, depending on what router platform you are using: <ul style="list-style-type: none">• For the AIP on Cisco 7500 series routers; For the ATM port adapter, ATM-CES port adapter, and enhanced ATM port adapter on Cisco 7200 series routers; For the 1-port ATM-25 network module on Cisco 2600 and 3600 series routers: <i>slot/0[.subinterface-number multipoint]</i>• For the ATM port adapter and enhanced ATM port adapter on Cisco 7500 series routers: <i>slot/port-adapter/0[.subinterface-number multipoint]</i>• For the NPM on Cisco 4500 and 4700 routers: <i>number[.subinterface-number multipoint]</i> For a description of these arguments, refer to the interface atm command.

Command Modes	Privileged EXEC
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Command History	Release	Modification
	11.3	This command was introduced.

Usage Guidelines

If the *vpi/vci* or *name* argument 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, which uses the **show atm svc** command without any of the optional arguments.

If the *vpi/vci* or *name* argument 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, which uses the **show atm svc** command with the *vpi/vci* specified as 0/34.

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, which uses the **show atm svc** command with the ATM subinterface specified as 2/0.2.

Examples

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

```
Router# show atm svc
```

Interface	VCD/ Name	VPI	VCI	Type	Encaps	Peak Kbps	Avg/Min Kbps	Burst 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
vnum = 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, VOwner: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/ Name	VPI	VCI	Type	Encaps	Peak Kbps	Avg/Min Kbps	Burst 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 9 describes significant fields shown in the displays.

Table 9 *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 9 *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 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 SVC.
UBR, UBR+, or VBR-NRT	<p>UBR—Unspecified Bit Rate QoS is specified for this SVC. See the ubr command for further information.</p> <p>UBR+—Unspecified Bit Rate QoS is specified for this SVC. See the ubr+ command for further information.</p> <p>VBR-NRT—Variable Bit Rate–Non Real Time QoS rates are specified for this SVC. See the vbr-nrt command for further information.</p>
etype	Encapsulation type.

Table 9 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	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 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 the SVC 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	<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 9 *show atm svc Field Descriptions (continued)*

Field	Description
OAM VC state	<p>This field will have one of the following states for this VC:</p> <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	<p>This field will have one of the following states for this VC:</p> <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.

Table 9 *show atm svc Field Descriptions (continued)*

Field	Description
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.
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, use the **show atm traffic** privileged EXEC command.

show atm traffic

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History	Release	Modification
	10.0	This command was introduced.

Examples

The following is sample output from the **show atm traffic** command for the ATM-CES port adapter on a Cisco 7200 series router:

```
Router# show atm traffic

0 Input packets
1044 Output packets
1021 Broadcast packets
0 Packets received on non-existent VC
0 Packets attempted to send on non-existent VC
0 OAM cells received
0 OAM cells sent
```

The following is sample output from the **show atm traffic** command for the AIP on a Cisco 7500 series router:

```
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 10](#) describes the fields shown in the display.

Table 10 *show atm traffic Field Descriptions*

Field	Description
Input packets	Total packets input.
Output packets	Total packets output.
Broadcast packets	Total broadcast packets output.
Packets received on nonexistent VC	Number of packets sent to virtual circuits not configured.
Packets attempted to send on non-existent VC	Number of packets attempted to be sent on a virtual circuit that were not configured.
OAM cells received	Total Operation, Administration, and Maintenance (OAM) 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.
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

Command	Description
pvc	Configures the PVC interface.
svc	Creates an ATM SVC and specifies the destination NSAP address on a main interface or subinterface.

