show lane bus through vc-class atm

show lane bus

To display detailed LAN Emulation (LANE) information for the broadcast and unknown server (BUS) configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN (ELAN), use the **show lane bus** command in user EXEC or privileged EXEC mode.

AIP on the Cisco 7500 Series Routers; ATM Port Adapter on the Cisco 7200 Series
show lane bus [{**interface atm** *slot/port* [. *subinterface-number*] | **name** *elan-name*}] [**brief**]

ATM Port Adapter on the Cisco 7500 Series Routers
show lane bus [{**interface atm** *slot/port-adapter/port* [. *subinterface-number*] | **name** *elan-name*}] [**brief**]

Cisco 4500 and 4700 Routers
show lane bus [{**interface atm** *number* [. *subinterface-number*] | **name** *elan-name*}] [**brief**]

Syntax Description

interface atm *slot/port*	(Optional) ATM interface slot and port for the following: • AIP on the Cisco 7500 series routers. • ATM port adapter on the Cisco 7200 series routers.
interface atm *slot* / *port-adapter* / *port*	(Optional) ATM interface slot, port adapter, and port number for the ATM port adapter on the Cisco 7500 series routers.
interface atm *number*	(Optional) ATM interface number for the NPM on the Cisco 4500 or 4700 routers.
. *subinterface-number*	(Optional) Subinterface number.
name *elan-name*	(Optional) Name of the ELAN. The maximum length of the name is 32 characters.
brief	(Optional) Displays the brief subset of available information.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show lane bus** command for an Ethernet ELAN:

```
Router# show lane bus
LE BUS ATM2/0.2  ELAN name: elan2  Admin: up  State: operational
type: ethernet        Max Frame Size: 1516
ATM address: 39.020304050607080910111213.00000CA05B42.02
data forward: vcd 61, 2 members, 0 packets, 0 unicasts
lecid  vcd    pkts   ATM Address
    1   58       0 39.020304050607080910111213.00000CA05B40.02
    2   82       0 39.020304050607080910111213.00602F557940.02
```

The following is sample output from the **show lane bus**command for a Token Ring LANE:

```
show lane bus
LE BUS ATM3/0.1  ELAN name: anubis  Admin: up  State: operational
type: token ring        Max Frame Size: 4544     Segment ID: 2500
ATM address: 47.009181000000000000000000.00000CA01662.01
data forward: vcd 14, 2 members, 0 packets, 0 unicasts

lecid  vcd    pkts   ATM Address
    1   11       0 47.009181000000000000000000.00000CA01660.01
    2   17       0 47.009181000000000000000000.00000CA04960.01
```

The table below describes significant fields shown in the display.

Table 1: show lane bus Field Descriptions

Field	Description
LE BUS ATM2/0.2	Interface and subinterface for which information is displayed.
ELAN name	Name of the ELAN for this BUS.
Admin	Administrative state, either up or down.
State	Status of this LANE BUS. Possible states include down and operational.
type	Type of ELAN.
Max Frame Size	Maximum frame size (in bytes) on the ELAN.
Segment ID	The ring number of the ELAN. This field appears only for Token Ring LANE.
ATM address	ATM address of this LANE BUS.
data forward	Virtual channel descriptor of the Data Forward VCC, the number of LANE clients attached to the VCC, and the number of packets sent on the VCC.
lecid	Identifier assigned to each LANE client on the Data Forward VCC.
vcd	Virtual channel descriptor used to reach the LANE client.
pkts	Number of packets sent by the BUS to the LANE client.
ATM Address	ATM address of the LANE client.

show lane client

To display detailed LAN Emulation (LANE) information for all the LANE clients configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN (ELAN), use the **show lane client** command in user EXEC or privileged EXEC mode.

AIP on the Cisco 7500 Series Routers; ATM Port Adapter on the Cisco 7200 Series
show lane client detail [{**interface atm** *slot/port* [**.** *subinterface-number*] | **name** *elan-name*}]
[**brief**]

ATM Port Adapter on the Cisco 7500 Series Routers
show lane client detail [{**interface atm** *slot/port-adapter/port* [**.** *subinterface-number*] | **name**
elan-name}] [**brief**]

Cisco 4500 and 4700 Routers
show lane client detail [{**interface atm** *number* [**.** *subinterface-number*] | **name** *elan-name*}] [**brief**]

Syntax Description

detail	Displays additional FSSRP information.
interface atm *slot/port*	(Optional) ATM interface slot and port for the following: • AIP on the Cisco 7500 series routers. • ATM port adapter on the Cisco 7200 series routers.
interface atm *slot/port-adapter/port*	(Optional) ATM interface slot, port adapter, and port number for the ATM port adapter on the Cisco 7500 series routers.
interface atm *number*	(Optional) ATM interface number for the NPM on the Cisco 4500 or 4700 routers.
. *subinterface-number*	(Optional) Subinterface number.
name *elan-name*	(Optional) Name of ELAN. The maximum length of the name is 32 characters.
brief	(Optional) Displays the brief subset of available information.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.0(5)T	The **detail** option and command output line "This client is running in FSSRP mode" were added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Release	Modification
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show lane client** command for an Ethernet ELAN:

```
Router# show lane client
LE Client ATM2/0.2  ELAN name: elan2  Admin: up  State: operational
Client ID: 1                LEC up for 11 minutes 49 seconds
Join Attempt: 1
HW Address: 0000.0ca0.5b40   Type: ethernet          Max Frame Size: 1516
ATM Address: 39.020304050607080910111213.00000CA05B40.02
 VCD  rxFrames  txFrames  Type       ATM Address
   0         0         0  configure  39.020304050607080910111213.00000CA05B43.00
  55         1         4  direct     39.020304050607080910111213.00000CA05B41.02
  56         6         0  distribute 39.020304050607080910111213.00000CA05B41.02
  59         0         1  send       39.020304050607080910111213.00000CA05B42.02
  60         3         0  forward    39.020304050607080910111213.00000CA05B42.02
  84         3         5  data       39.020304050607080910111213.00602F557940.02
```

The following is sample output from the **show lane client** command for a Token Ring LANE:

```
Router# show lane client
LE Client ATM4/0.1  ELAN name: elan1  Admin: up  State: operational
Client ID: 1                LEC up for 2 hours 26 minutes 3 seconds
Join Attempt: 3
HW Address: 0060.4770.4180   Type: token ring        Max Frame Size: 4544
Ring:100    Bridge:2       ELAN Segment ID: 2048
ATM Address: 39.020304050607080910111213.006047704180.01
 VCD  rxFrames  txFrames  Type       ATM Address
   0         0         0  configure  39.020304050607080910111213.006047704183.00
  10         1         3  direct     39.020304050607080910111213.006047704181.01
  11         2         0  distribute 39.020304050607080910111213.006047704181.01
  14         0         0  send       39.020304050607080910111213.006047704182.01
  15         0         0  forward    39.020304050607080910111213.006047704182.01
```

The following is sample output from the **show lane client detail**command.

```
Router# show lane client detail
LE Client ATM1/0.1 ELAN name:xxx Admin:up State:operational
Client ID:2 LEC up for 5 days 40 minutes 45 seconds
ELAN ID:0
This client is running in FSSRP mode.
Join Attempt:14
Known LE Servers:1
Configured Idle Time:5 seconds
Last Fail Reason:Config VC being released
HW Address:00e0.8fcf.d820   Type:ethernet          Max Frame Size:1516
ATM Address:47.0091810000000061705B0C01.00E08FCFD820.01
 VCD rxFrames txFrames Type ATM Address
 0  0  0  configure  47.00918100000000613E5A2F01.006070174823.00

LEC ID:2, State:LESBUS_ACTIVE
 52  1778 3556 direct 47.00918100000000613E5A2F01.00000C5A0C59.01
 53 1778 0 distribute 47.00918100000000613E5A2F01.00000C5A0C59.01
 54  0 0 send 47.00918100000000613E5A2F01.00000C5A0C5A.01
 55  0 0 forward 47.00918100000000613E5A2F01.00000C5A0C5A.01

LEC ID:3, State:LESBUS_ACTIVE
```

```
93 122 234 direct 47.00918100000000613E5A2F01.00000ABCD001.09
94 122 0 distribute 47.00918100000000613E5A2F01.00000ABCD001.09
97 0 0 send 47.00918100000000613E5A2F01.00000ABCD002.09
08 0 0 forward 47.00918100000000613E5A2F01.00000ABCD002.09
```

The table below describes significant fields shown in the display.

Table 2: show lane client Field Descriptions

Field	Description
LE Client ATM2/0.2	Interface and subinterface of this client.
ELAN name	Name of the ELAN.
Admin	Administrative state, either up or down.
State	Status of this LANE client. Possible states include initialState, lecsConnect, configure, join, busConnect, and operational.
Client ID	The LANE 2-byte client ID assigned by the LANE server.
Join Attempt	The number of attempts made before successfully joining the ELAN.
HW Address	MAC address of this LANE client.
Type	Type of ELAN.
Max Frame Size	Maximum frame size (in bytes) on the ELAN.
Ring	The ring number for the client. This field appears only for Token Ring LANE.
Bridge	The bridge number for the client. This field appears only for Token Ring LANE.
ELAN Segment ID	The ring number for the ELAN. This field appears only for Token Ring LANE.
ATM Address	ATM address of this LANE client.
VCD	Virtual channel descriptor for each of the VCCs established for this LANE client.
rxFrames	Number of frames received.
txFrames	Number of frames sent.
Type	Type of VCC. The Configure Direct VCC is shown in this display as *configure*. The Control Direct VCC is shown as *direct*; the Control Distribute VCC is shown as *distribute*. The Multicast Send VCC and Multicast Forward VC are shown as *send* and *forward*, respectively. The Data Direct VCC is shown as *data*.
ATM Address	ATM address of the LANE component at the other end of this VCC.

Related Commands

Command	Description
lane client	Activates a LANE client on the specified subinterface.

Command	Description
lane fssrp	Enables the special LANE features so that LANE components (such as the LANE configuration server, the LANE client, the LANE server, and the BUS) become aware of FSSRP.
lane server	Activates a LANE server on the specified subinterface.
show lane config	Displays global LANE information for the configuration server configured on an interface.

show lane config

To display global LAN Emulation (LANE) information for the configuration server configured on an interface, use the **show lane config** command in user EXEC or privileged EXEC mode.

AIP on the Cisco 7500 Series Routers; ATM Port Adapter on the Cisco 7200 Series
show lane config [**interface atm** *slot* /**0**]

ATM Port Adapter on the Cisco 7500 Series Routers
show lane config [**interface atm** *slot/port-adapter/* **0**]

Cisco 4500 and 4700 Routers
show lane config [**interface atm** *number*]

Syntax Description

interface atm *slot* /**0**	(Optional) ATM interface slot and port for the following: • AIP on the Cisco 7500 series routers. • ATM port adapter on the Cisco 7200 series routers.
interface atm *slot/port-adapter* /**0**	(Optional) ATM interface slot, port adapter, and port number for the ATM port adapter on the Cisco 7500 series routers.
interface atm *number*	(Optional) ATM interface number for the NPM on the Cisco 4500 or 4700 routers.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample **show lane config** output for an Ethernet ELAN:

```
Router# show lane config
LE Config Server ATM2/0 config table: cisco_eng
Admin: up  State: operational
LECS Mastership State: active master
list of global LECS addresses (30 seconds to update):
39.020304050607080910111213.00000CA05B43.00
ATM Address of this LECS: 39.020304050607080910111213.00000CA05B43.00 (auto)
 vcd  rxCnt  txCnt  callingParty
  50      2      2  39.020304050607080910111213.00000CA05B41.02 LES elan2 0 active
```

```
cumulative total number of unrecognized packets received so far: 0
cumulative total number of config requests received so far: 30
cumulative total number of config failures so far: 12
    cause of last failure: no configuration
    culprit for the last failure: 39.020304050607080910111213.00602F557940.01
```

The following example shows sample **show lane config** output for TR-LANE:

```
Router# show lane config
LE Config Server ATM4/0 config table: eng
Admin: up   State: operational
LECS Mastership State: active master
list of global LECS addresses (40 seconds to update):
39.020304050607080910111213.006047704183.00
ATM Address of this LECS: 39.020304050607080910111213.006047704183.00 (auto)
 vcd  rxCnt  txCnt  callingParty
   7      1      1  39.020304050607080910111213.006047704181.01 LES elan1 0 active
cumulative total number of unrecognized packets received so far: 0
cumulative total number of config requests received so far: 2
cumulative total number of config failures so far: 0
```

The table below describes significant fields shown in the display.

Table 3: show lane config Field Descriptions

Field	Description
LE Config Server	Major interface on which the LAN emulated Configuration Server (LECS) is configured.
config table	Name of the database associated with the LECS.
Admin	Administrative state, either up or down.
State	State of the configuration server: down or operational. If down, the reasons field indicates why it is down. The reasons include the following: NO-config-table, NO-nsap-address, and NO-interface-up.
LECS Mastership State	Mastership state of the configuration server. If you have configured simple server redundancy, the configuration server with the lowest index is the active LECS.
list of global LECS addresses	List of LECS addresses.
40 seconds to update	Amount of time until the next update.
39.020304050607080910111213.00000CA05B43.00	ATM address of the configuration server.
ATM Address of this LECS	ATM address of the active configuration server.
auto	Method of ATM address assignment for the configuration server. In this example, the address is assigned by the automatic method.
vcd	Virtual circuit descriptor that uniquely identifies the configure VCC.

Field	Description
rxCnt	Number of packets received.
txCnt	Number of packets sent.
callingParty	ATM NSAP address of the LANE component that is connected to the LECS. "elan1" indicates the ELAN name, "0" indicates the priority number, and "active" indicates that the server is active.

show lane database

To display the database of the configuration server, use the **show lane database** command in user EXEC or privileged EXEC mode.

show lane database [*database-name*]

Syntax Description

database-name	(Optional) Specific database name.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

By default, this command displays the LAN Emulated Configuration Server information displayed by the **show lane config** command.

If no database name is specified, this command shows all databases.

Examples

The following is sample output of the **show lane database** command for an Ethernet LANE:

```
Router# show lane database
LANE Config Server database table 'engandmkt' bound to interface/s: ATM1/0
default elan: none
elan 'eng': restricted
  server 45.000001415555121f.yyyy.zzzz.0800.200c.1001.01 (prio 0) active
  LEC MAC  0800.200c.1100
  LEC NSAP 45.000001415555121f.yyyy.zzzz.0800.200c.1000.01
  LEC NSAP 45.000001415555124f.yyyy.zzzz.0800.200c.1300.01
elan 'mkt':
  server 45.000001415555121f.yyyy.zzzz.0800.200c.1001.02 (prio 0) active
  LEC MAC  0800.200c.1200
  LEC NSAP 45.000001415555121f.yyyy.zzzz.0800.200c.1000.02
  LEC NSAP 45.000001415555124f.yyyy.zzzz.0800.200c.1300.02
```

The following is sample output of the **show lane database** command for a Token Ring LANE:

```
Router# show lane database
LANE Config Server database table 'eng' bound to interface/s: ATM4/0
default elan: elan1
elan 'elan1': un-restricted, local-segment-id 2048
  server 39.020304050607080910111213.006047704181.01 (prio 0) active
```

The table below describes significant fields shown in the display.

Table 4: show lane database Field Descriptions

Field	Description
LANE Config Server database	Name of this database and interfaces bound to it.
default elan	Default name, if one is established.
elan	Name of the ELAN whose data is reported in this line and the following indented lines.
un-restricted	Indicates whether this ELAN is restricted or unrestricted.
local-segment-id 2048	Ring number of the ELAN.
server	ATM address of the configuration server.
(prio 0) active	Priority level and simple server redundancy state of this configuration server. If you have configured simple server redundancy, the configuration server with the lowest priority will be active.
LEC MAC	MAC addresses of an individual LANE client in this ELAN. This display includes a separate line for every LANE client in this ELAN.
LEC NSAP	ATM addresses of all LANE clients in this ELAN.

show lane default-atm-addresses

To display the automatically assigned ATM address of each LANE component in a router or on a specified interface or subinterface, use the **show lane default-atm-addresses** command in user EXEC or privileged EXEC mode.

AIP on the Cisco 7500 series routers; ATM port adapter on the Cisco 7200 series
show lane default-atm-addresses [**interface atm** *slot/port* **.** *subinterface-number*]

ATM Port Adapter on the Cisco 7500 Series Routers
show lane default-atm-addresses [**interface atm** *slot/port-adapter/port* **.** *subinterface-number*]

Cisco 4500 and 4700 Routers
show lane default-atm-addresses [**interface atm** *number* **.** *subinterface-number*]

Syntax Description

interface atm *slot/port*	(Optional) ATM interface slot and port for the following:
	• AIP on the Cisco 7500 series routers.
	• ATM port adapter on the Cisco 7200 series routers.
interface atm *slot/port-adapter/port*	(Optional) ATM interface slot, port adapter, and port number for the ATM port adapter on the Cisco 7500 series routers.
interface atm *number*	(Optional) ATM interface number for the NPM on the Cisco 4500 or 4700 routers.
. *subinterface-number*	(Optional) Subinterface number.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
11.1	The *number* **.** *subinterface-number* argument was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

It is not necessary to have any of the LANE components running on this router before you use this command.

Examples

The following is sample output of the **show lane default-atm-addresses** command for the ATM interface 1/0 when all the major LANE components are located on that interface:

```
Router# show lane default-atm-addresses interface atm1/0
interface ATM1/0:
LANE Client:        47.000000000000000000000000.00000C304A98.**
LANE Server:        47.000000000000000000000000.00000C304A99.**
LANE Bus:           47.000000000000000000000000.00000C304A9A.**
LANE Config Server: 47.000000000000000000000000.00000C304A9B.00
note: ** is the subinterface number byte in hex
```

The table below describes the significant fields shown in the display.

Table 5: show lane default-atm-addresses Field Descriptions

Field	Description
interface ATM1/0:	Specified interface.
LANE Client:	ATM address of the LANE client on the interface.
LANE Server:	ATM address of the LANE server on the interface.
LANE Bus:	ATM address of the LANE broadcast and unknown server on the interface.
LANE Config Server:	ATM address of the LAN Emulated Configuration Server on the interface.

show lane le-arp

To display the LANE ARP table of the LANE client configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN (ELAN), use the **show lane le-arp** command in user EXEC or privileged EXEC mode.

AIP on the Cisco 7500 series routers; ATM Port Adapter on the Cisco 7200 series
show lane le-arp [{**interface atm** *slot/port* [**.** *subinterface-number*] | **name** *elan-name*}]

ATM Port Adapter on the Cisco 7500 Series Routers
show lane le-arp [{**interface atm** *slot/port-adapter/port* [**.** *subinterface-number*] | **name** *elan-name*}]

Cisco 4500 and 4700 Routers
show lane le-arp [{**interface atm** *number* [**.** *subinterface-number*] | **name** *elan-name*}]

Syntax Description

interface atm *slot/port*	(Optional) ATM interface slot and port for the following: • AIP on the Cisco 7500 series routers. • ATM port adapter on the Cisco 7200 series routers.
interface atm *slot/port-adapter/port*	(Optional) ATM interface slot, port adapter, and port number for the ATM port adapter on the Cisco 7500 series routers.
interface atm *number*	(Optional) ATM interface number for the NPM on the Cisco 4500 or 4700 routers.
. *subinterface-number*	(Optional) Subinterface number.
name *elan-name*	(Optional) Name of the ELAN. The maximum length of the name is 32 characters.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output of the **show lane le-arp** command for an Ethernet LANE client:

```
Router# show lane le-arp
Hardware Addr   ATM Address                                 VCD  Interface
```

```
0000.0c15.a2b5  39.000000000000000000000000.00000C15A2B5.01  39  ATM1/0.1
0000.0c15.f3e5  39.000000000000000000000000.00000C15F3E5.01  25* ATM1/0.1
```

The following is sample output of the **show lane le-arp** command for a Token Ring LANE client:

```
Router# show lane le-arp
Ring Bridge      ATM Address                                 VCD  Interface
512   6          39.020304050607080910111213.00602F557940.01  47  ATM2/0.1
```

The table below describes the significant fields shown in the display.

Table 6: show lane le-arp Field Descriptions

Field	Description
Hardware Addr	MAC address, in dotted hexadecimal notation, assigned to the LANE component at the other end of this VCD.
Ring	Route descriptor segment number for the LANE component.
Bridge	Bridge number for the LANE component.
ATM Address	ATM address of the LANE component at the other end of this VCD.
VCD	Virtual circuit descriptor.
Interface	Interface or subinterface used to reach the specified component.

show lane neighbor

To display information about all LAN Emulation (LANE) clients that are directly connected to a device, use the **show lane neighbor** command in user EXEC or privileged EXEC mode.

show lane neighbor

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.2(25)S	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Usage Guidelines

Enter this command on any device using an image that supports LANE.

Use this command to display the IP address of the LANE clients directly connected to the device and the numbers of the virtual channel descriptors (VCDs) that connect the LANE clients and the device.

- If the device is using a Cisco IOS image that supports LANE quality of service (QoS), the command displays the IP address of the LANE client, the unspecified bit rate (UBR) service category for the VCD, the UBR+ service category for the VDC, and the IP class of service (CoS) for the connection.

- If the Cisco IOS image on the device does not support LANE QoS, the command displays 0 for the UBR+ VCD and the IP CoS values.

Examples

The following is sample output from the **show lane neighbor**command entered on a device using a Cisco IOS Release 12.2S or 12.2SB image that does not support LANE CoS:

```
Router# show lane neighbor
Lane Neighbor Group List
IP Address      UBRVCD       UBRPLUS VCD      IP cos
10.11.0.11      143              0                0
10.13.0.11      148              0                0
```

The table below describes the significant fields shown in the display.

Table 7: show lane neighbor Field Descriptions

Field	Description
IP Address	Identifies the IP address of the directly connected LANE client.
UBRVCD	Identifies the VCD number for a connection with unspecified bit rate QoS.
UBRPLUS VCD	Identifies the VCD number for a connection with unspecified bit rate QoS that has a minimum cell rate (MCR) configuration.

Field	Description
IP cos	Identifies an IP CoS value.

Related Commands

Command	Description
show lane client	Displays detailed LANE information for all the LANE clients configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN.

show lane server

To display global information for the LANE server configured on an interface, on any of its subinterfaces, on a specified subinterface, or on an emulated LAN (ELAN), use the **show lane server** command in user EXEC or privileged EXEC mode.

AIP on the Cisco 7500 Series Routers; ATM Port Adapter on the Cisco 7200 Series
show lane server [{interface atm *slot/port* [. *subinterface-number*] | name *elan-name*}] [brief]

ATM Port Adapter on the Cisco 7500 Series Routers
show lane server [{interface atm *slot/port-adapter/port* [. *subinterface-number*] | name *elan-name*}] [brief]

Cisco 4500 and 4700 Routers
show lane server [{interface atm *number* [. *subinterface-number*] | name *elan-name*}] [brief]

Syntax Description

interface atm *slot/port*	(Optional) ATM interface slot and port for the following: • AIP on the Cisco 7500 series routers. • ATM port adapter on the Cisco 7200 series routers.
interface atm *slot / port-adapter / port*	(Optional) ATM interface slot, port adapter, and port number for the ATM port adapter on the Cisco 7500 series routers.
interface atm *number*	(Optional) ATM interface number for the NPM on the Cisco 4500 or 4700 routers.
. *subinterface-number*	(Optional) Subinterface number.
name *elan-name*	(Optional) Name of the ELAN. The maximum length of the name is 32 characters.
brief	(Optional) Keyword used to display the brief subset of available information.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show lane server** command for an Ethernet ELAN:

```
Router# show lane server
LE Server ATM2/0.2  ELAN name: elan2  Admin: up  State: operational
type: ethernet        Max Frame Size: 1516
ATM address: 39.020304050607080910111213.00000CA05B41.02
LECS used: 39.020304050607080910111213.00000CA05B43.00 connected, vcd 51
control distribute: vcd 57, 2 members, 2 packets
proxy/ (ST: Init, Conn, Waiting, Adding, Joined, Operational, Reject, Term)
lecid ST vcd    pkts Hardware Addr  ATM Address
    1  O   54       2 0000.0ca0.5b40 39.020304050607080910111213.00000CA05B40.02
    2  O   81       2 0060.2f55.7940 39.020304050607080910111213.00602F557940.02
```

The following is sample output from the **show lane server** command for a Token Ring ELAN:

```
Router# show lane server
LE Server ATM3/0.1  ELAN name: anubis  Admin: up  State: operational
type: token ring       Max Frame Size: 4544      Segment ID: 2500
ATM address: 47.009181000000000000000000.00000CA01661.01
LECS used: 47.009181000000000000000000.00000CA01663.00 connected, vcd 6
control distribute: vcd 10, 2 members, 4 packets
proxy/ (ST: Init, Conn, Waiting, Adding, Joined, Operational, Reject, Term)
lecid ST vcd    pkts Hardware Addr  ATM Address
    1  O    7       3 400.1          47.009181000000000000000000.00000CA01660.01
                      0000.0ca0.1660 47.009181000000000000000000.00000CA01660.01
    2  O   16       3 300.1          47.009181000000000000000000.00000CA04960.01
                      0000.0ca0.4960 47.009181000000000000000000.00000CA04960.01
```

The table below describes the significant fields shown in the display.

Table 8: show lane server Field Descriptions

Field	Description
LE Server ATM2/0.2	Interface and subinterface of this server.
ELAN name	Name of the ELAN.
Admin	Administrative state, either up or down.
State	Status of this LANE server. Possible states for a LANE server include down, waiting_ILMI, waiting_listen, up_not_registered, operational, and terminating.
type	Type of ELAN.
Max Frame Size	Maximum frame size (in bytes) of this type of emulated LAN.
Segment ID	The ring number of the ELAN. This field appears only for Token Ring LANE.
ATM address	ATM address of this LANE server.
LECS used	ATM address of the LANE configuration server being used. This line also shows the current state of the connection between the LANE server and the LAN Emulated Configuration Server (LECS), and the virtual circuit descriptor (VCD) of the circuit connecting them.
control distribute	VCD of the Control Distribute VCC.
proxy	Status of the LANE client at the other end of the Control Distribute VCC.

Field	Description
lecid	Identifier for the LANE client at the other end of the Control Distribute VCC.
ST	Status of the LANE client at the other end of the Control Distribute VCC. Possible states are Init, Conn, Waiting, Adding, Joined, Operational, Reject, and Term.
vcd	Virtual channel descriptor used to reach the LANE client.
pkts	Number of packets sent by the LANE server on the Control Distribute VCC to the LANE client.
Hardware Addr	The top number in this column is the router descriptor, and the second number is the MAC-layer address of the LANE client.
ATM Address	ATM address of the LANE client.

show mpoa client

Note
Effective with Cisco IOS Release 15.1M, the **show mpoa client**command is not available in Cisco IOS software.

To display a summary of information regarding one or all Multiprotocol over ATM (MPOA) clients (MPCs), use the **show mpoa client** command in user EXEC or privileged EXEC mode.

show mpoa client [**name** *mpc-name*] [**brief**]

Syntax Description

name *mpc-name*	(Optional) Name of the MPC with the specified name.
brief	(Optional) Output limit of the command.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	**Modification**
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines
If you omit the **name** keyword, the command displays information for all MPCs.

Examples
The following is sample output from the **show mpoa client**command:

```
Router# show mpoa client name ip_mpc brief
MPC Name: ip_mpc, Interface: ATM1/0, State: Up
MPC actual operating address: 47.00918100000000613E5A2F01.0010A6943825.00
Shortcut-Setup Count: 1, Shortcut-Setup Time: 1
Lane clients bound to MPC ip_mpc: ATM1/0.1
Discovered MPS neighbors                      kp-alv    vcd      rxPkts      txPkts
47.00918100000000613E5A2F01.006070174824.00     59      30          28           2
Remote Devices known                                    vcd      rxPkts      txPkts
47.00918100000000613E5A2F01.00000C5A0C5D.00             35           0          10
```

The table below describes the significant fields shown in the display.

Table 9: show mpoa client Field Descriptions

Field	Description
MPC Name	Name specified for the MPC.
Interface	Interface to which the MPC is attached.
State	Current state of the MPC.
MPC actual operating address	ATM address of the MPC.
Shortcut-Setup Count	Current number specified by the **shortcut-frame-count** command.
Shortcut-Setup Time	Current value specified by the **shortcut-frame-time** command.
Lane clients bound to MPC ip_mpc	List of LANE clients currently bound to MPC ip_mpc.
Discovered MPS neighbours	List of learned MPS addresses.
kp-alv	Number of seconds until the next keepalive message should be received.
vcd	Number that identifies the virtual circuit.
rxPkts	Number of packets received from the learned MPS.
txPkts	Number of packets sent to the learned MPS.
Remote Devices known	List of other devices (typically other MPCs) not in this ELAN.
vcd	Number that identifies the virtual circuit to that MPC.
rxPkts	Number of packets received from the learned remote device.
txPkts	Number of packets sent to the learned remote device.

Related Commands

Command	Description
clear mpoa client name	Clears the ingress and egress cache entries.

show mpoa client cache

✎

Note   Effective with Cisco IOS Release 15.1M, the **show mpoa client cache**command is not available in Cisco IOS software.

To display the ingress or egress cache entries matching the IP addresses for the Multiprotocol over ATM (MPOA) clients (MPCs), use the **show mpoa client cache** command in user EXEC or privileged EXEC mode.

show mpoa client [**name** *mpc-name*] **cache** [{**ingress** | **egress**}] [**ip-address** *ip-address*]

Syntax Description

name *mpc-name*	(Optional) Name of the MPC with the specified name.
ingress	(Optional) Displays ingress cache entries associated with an MPC.
egress	(Optional) Displays egress cache entries associated with an MPC.
ip-address *ip-address*	(Optional) Displays cache entries that match the specified IP address.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Examples   The following is sample output from the **show mpoa client cache**command for a specific MPC:

```
Router# show mpoa client ip_mpc cache
MPC Name: ip-mpc, Interface: ATM1/0, State: Up
MPC actual operating address: 47.00918100000000613E5A2F01.0010A6943825.00
Shortcut-Setup Count: 1, Shortcut-Setup Time: 1
Number of Ingress cache entries: 1
MPC Ingress Cache Information:
Dst IP addr     State   vcd Expires Egress MPC Atm address
20.20.20.1      RSVLD   35   11:38 47.00918100000000613E5A2F01.00000C5A0C5D.00
Number of Egress cache entries: 1
MPC Egress Cache Information:
Dst IP addr        Dst MAC       Src MAC      MPSid  Elan Expires  CacheId  Tag
10.10.10.1      0000.0c5a.0c58 0060.7017.4820    9    2   11:55         1    1
```

The table below describes the significant fields shown in the display.

Table 10: show mpoa client cache Field Descriptions

Field	Description
MPC Name	Name specified for the MPC.
Interface	Interface to which the MPC is attached.
State	Current state of the MPC (up or down).
MPC actual operating address	ATM address of the MPC.
Shortcut-Setup Count	Current number specified by the **shortcut-frame-count** command.
Number of Ingress cache entries	Number of entries in the ingress cache.
MPC Ingress Cache Information	
Dst IP addr	IP address of the destination.
State	State of the ingress cache entry. (Valid states are initialized, trigger, refresh, hold-down, resolved, and suspended.)
vcd	Number that identifies the virtual circuit.
Expires	Time in minutes or seconds until the ingress cache entry expires.
Egress MPC Atm address	ATM address of the egress MPC.
Number of Egress cache entries	Number of entries in the egress cache.
MPC Egress Cache Information	
Dst IP addr	IP address of the destination.
Dst MAC	MAC address of the destination.
Src MAC	MAC address of the source.
MPSid	Unique number representing the egress MPS.
Elan	ELAN identifier of the ELAN serving this destination IP address.
Expires	Time in minutes or seconds until the egress cache entry expires.
CacheID	Cache identifier.
Tag	Label (tag) identifier.

show mpoa client statistics

✎

Note   Effective with Cisco IOS Release 15.1M, the **show mpoa client statistics**command is not available in Cisco IOS software.

To display all the statistics collected by a Multiprotocol over ATM (MPOA) client (MPC), use the **show mpoa client statistics** command in user EXEC or privileged EXEC mode.

show mpoa client [**name** *mpc-name*] **statistics**

Syntax Description

name	*mpc-name*	(Optional) Specifies the name of the MPC.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	**Modification**
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines   This command displays all the statistics collected by an MPC.

Examples   The following is sample output from the **show mpoa client statistics** command for the MPC named ip_mpc:

```
Router# show mpoa client name ip_mpc statistics
MPC Name: ip_mpc, Interface: ATM1/0, State: Up
MPC actual operating address: 47.00918100000000613E5A2F01.0010A6943825.00
Shortcut-Setup Count: 1, Shortcut-Setup Time: 1
                                Transmitted      Received
MPOA Resolution Requests             2               0
MPOA Resolution Replies              0               2
MPOA Cache Imposition Requests       0               0
MPOA Cache Imposition Replies        0               0
MPOA Cache Purge Requests            0               0
MPOA Cache Purge Replies             0               0
MPOA Trigger Request                 0               0
NHRP Purge Requests                  0               0
Invalid MPOA Data Packets Received: 0
```

show mpoa default-atm-addresses

✎

Note   Effective with Cisco IOS Release 15.1M, the **show mpoa default-atm-addresses**command is not available in Cisco IOS software.

To display the default ATM addresses for the Multiprotocol over ATM (MPOA) client (MPC), use the **show mpoa default-atm-addresses** command in user EXEC or privileged EXEC mode.

show   mpoa   default-atm-addresses

Syntax Description   This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Examples   The following is sample output from the **show mpoa default-atm-addresses** command when the switch prefix is not available:

```
Router# show mpoa default-atm-addresses
interface ATM1/0:
MPOA Server: ...006070174824.**
MPOA Client: ...006070174825.**
note: ** is the MPS/MPC instance number in hex
interface ATM2/0:
MPOA Server: ...006070174844.**
MPOA Client: ...006070174845.**
note: ** is the MPS/MPC instance number in hex
```

The following is sample output from the **show mpoa default-atm-addresses** command when the switch prefix is available:

```
Router# show mpoa default-atm-addresses
interface ATM1/0:
MPOA Server: 47.00918100000000613E5A2F01.006070174824.**
MPOA Client: 47.00918100000000613E5A2F01.006070174825.**
note: ** is the MPS/MPC instance number in hex
interface ATM2/0:
MPOA Server: 47.10000000000000000000000000.006070174844.**
```

```
MPOA Client: 47.100000000000000000000000.006070174845.**
note: ** is the MPS/MPC instance number in hex
```

The table below describes the significant fields shown in the display.

Table 11: show mpoa default-atm-addresses Field Descriptions

Field	Description
interface ATM1/0	Specified interface.
MPOA Server	ATM address of the MPOA server on the interface.
MPOA Client	ATM address of the MPOA client on the interface.

show mpoa server

✎

Note Effective with Cisco IOS Release 15.1M, the **show mpoa server**command is not available in Cisco IOS software.

To display information about any specified Multiprotocol over ATM (MPOA) server (MPS) or all MPSs in the system, depending on whether the name of the required MPS is specified, use the **show mpoa server** command in user EXEC or privileged EXEC mode.

show mpoa server [**name** *mps-name*]

Syntax Description

name *mps-name*	(Optional) Specifies the name of the MPS.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines The command displays information about server configuration parameters. It also displays information about LAN Emulated Clients (LECs) that are bound to the MPOA server neighbors (both MPC and MPS).

Examples The following is sample output from the **show mpoa server**command, with a specified name:

```
Router# show mpoa server name ip_mps
MPS Name: ip_mps, MPS id: 0, Interface: ATM1/0, State: up
network-id: 1, Keepalive: 25 secs, Holding time: 1200 secs
Keepalive lifetime: 75 secs, Giveup time: 40 secs
MPS actual operating address: 47.00918100000000613E5A2F01.006070174824.00
Lane clients bound to MPS ip_mps: ATM1/0.1 ATM1/0.2
Discovered neighbours:
MPC 47.00918100000000613E5A2F01.00000C5A0C5D.00 vcds: 39(R,A)
MPC 47.00918100000000613E5A2F01.0010A6943825.00 vcds: 40(R,A)
```

The table below describes the significant fields shown in the display.

Table 12: show mpoa server Field Descriptions

Field	Description
MPS Name	Name of the MPOA server.
MPS id	ID of the MPOA server.
Interface	Interface to which the MPS is attached.
State	State of the MPOA server: up or down.
network-id	Network ID used for partitioning.
Keepalive	Keepalive time value.
Holding time	Holding time value.
Keepalive lifetime	Keepalive lifetime value.
Giveup time	Minimum time to wait before giving up on a pending resolution request.
MPS actual operating address	Actual control address of this MPS.
Lane clients bound to MPS ip_mps	List of LANE clients served by the MPS.
Discovered neighbours	MPOA devices discovered by the clients bound to this MPS.

Related Commands

Command	Description
clear mpoa server name	Clears the ingress and egress cache entries of one or all MPCs.

show mpoa server cache

✎

Note   Effective with Cisco IOS Release 15.1M, the **show mpoa server cache**command is not available in Cisco IOS software.

To display ingress and egress cache entries associated with an Multiprotocol over ATM (MPOA) server (MPS), use the show mpoa server cache command in user EXEC or privileged EXEC mode.

show mpoa server [**name** *mps-name*] **cache** [{**ingress** | **egress**}] [**ip-address** *ip-address*]

Syntax Description

name *mps-name*	(Optional) Specifies the name of an MPS.
ingress	(Optional) Displays ingress cache entries associated with a server.
egress	(Optional) Displays egress cache entries associated with a server.
ip-address *ip-address*	(Optional) Displays the entries that match the specified IP address.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines   This command displays ingress and egress cache entries associated with an MPS.

Examples   The following is sample output from the **show mpoa server cache**command, with a name specified:

```
Router# show mpoa server name ip_mps cache
MPS Name: ip_mps, MPS id: 0, Interface: ATM1/0, State: up
network-id: 1, Keepalive: 25 secs, Holding time: 1200 secs
Keepalive lifetime: 75 secs, Giveup time: 40 secs
MPS actual operating address: 47.00918100000000613E5A2F01.006070174824.00
Number of Ingress cache entries: 1
Ingress Cache information:
  IP address      Ingress MPC ATM Address                       Remaining Time
  20.20.20.1      47.00918100000000613E5A2F01.0010A6943825.00   19:07
Number of Egress cache entries: 1
Egress Cache information:
  Dst IP address  Ingress MPC ATM Address                       Remaining Time
```

```
    20.20.20.1      47.00918100000000613E5A2F01.0010A6943825.00    19:06
       src IP 20.20.20.2, cache Id 1
```

The table below describes the significant fields shown in the display.

Table 13: show mpoa server cache Field Descriptions

Field	Description
MPS Name	Name of the MPOA server.
MPS id	ID of the MPOA server.
Interface	Interface to which the MPS is attached.
State	State of the MPOA server: up or down.
network-id	Network ID used for partitioning.
Keepalive	Keepalive time value.
Holding time	Holding time value.
Keepalive lifetime	Keepalive lifetime value.
Giveup time	Minimum time to wait before giving up on a pending resolution request.
MPS actual operating address	Actual control address of this MPS.
Number of Ingress cache entries	Number of entries in the ingress cache.
Ingress Cache information	Information of ingress cache.
IP address	IP address of the MPC.
Ingress MPC ATM Address	ATM address of the ingress MPC.
Remaining Time	Time for which the cache entry is valid.
Number of Egress cache entries	Number of entries in the egress cache.
Egress Cache information	Information of egress cache.
Dst IP address	IP address of the destination.
src IP	IP address of the source MPS that originated the NHRP resolution request.
cache Id	Cache identifier.

show mpoa server statistics

✎

Note   Effective with Cisco IOS Release 15.1M, the **show mpoa server statistics**command is not available in Cisco IOS software.

To display all the statistics collected by an Multiprotocol over ATM (MPOA) server (MPS), use the **show mpoa server statistics** command in user EXEC or privileged EXEC mode.

show mpoa server [**name** *mps-name*] **statistics**

Syntax Description

name *mps-name*	(Optional) Specifies the name of an MPS.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines   This command will display all the statistics collected by an MPS. The statistics pertain to the ingress or egress cache entry creation, deletion, and failures.

Examples   The following is a sample output from the **show mpoa server statistics**command, with a name specified:

```
Router# show mpoa server name ip_mps statistics
MPS Name: ip_mps, MPS id: 0, Interface: ATM1/0, State: up
network-id: 1, Keepalive: 25 secs, Holding time: 1200 secs
Keepalive lifetime: 75 secs, Giveup time: 40 secs
MPS actual operating address: 47.00918100000000613E5A2F01.006070174824.00
Opcode                          Transmitted    Received
--------------------------------------------------------
MPOA Resolution Requests                          2
MPOA Resolution Replies             2
MPOA Cache Imposition Requests      1
MPOA Cache Imposition Replies                     1
MPOA Egress Cache Purge Requests                  0
MPOA Egress Cache Purge Replies     0
NHRP Resolution Requests            0             0
NHRP Resolution Replies             0             0
NHRP Purge Requests                 0             0
```

The table below describes the significant fields shown in the display.

Table 14: show mpoa server statistics Field Descriptions

Field	Description
MPS Name	Name of the MPOA server.
MPS id	ID of the MPOA server.
Interface	Specified interface.
State	State of the MPOA server: up or down.
network-id	Network ID used for partitioning.
Keepalive	Keepalive time value.
Holding time	Holding time value.
Keepalive lifetime	Keepalive lifetime value.
Giveup time	Minimum time to wait before giving up on a pending resolution request.
MPS actual operating address	Actual control address of this MPS.

show network-clocks

To display the current configured and active network clock sources, use the **shownetwork-clocks** command in privileged EXEC mode.

show network-clocks

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRD1	This command was introduced to display BITS clock information for the 7600-ES+ITU-2TG and 7600-ES+ITU-4TG.

Usage Guidelines

On the Cisco MC3810, this command applies to Voice over Frame Relay, Voice over ATM, and Voice over HDLC. The Cisco MC3810 has a background task that verifies whether a valid clocking configuration exists every 120 seconds. If this task detects an error, you will be reminded every 120 seconds until the error is corrected. A clocking configuration error may be generated for various reasons. Using the **shownetwork-clocks** command, you can display the clocking configuration status.

On the Cisco 7600 series routers, this command applies to the following:

• The clock source from the POS SPAs on the SIP-200 and the SIP-400.

• The 24-Port Channelized T1/E1 ATM CEoP SPA and the 1-Port Channelized OC-3 STM1 ATM CEoP SPA on the SIP-400.

• The 7600-ES+ITU-2TG and 7600-ES+ITU-4TG line cards.

Examples

The following is sample output from the **shownetwork-clocks** EXEC command:

```
Router# show network-clocks
Priority 1 clock source: ATM3/0/0
Priority 2 clock source: System clock
Priority 3 clock source: System clock
Priority 4 clock source: System clock
Current clock source:ATM3/0/0, priority:1
```

The following is sample output from the **shownetwork-clocks** command on the Cisco MC3810:

```
Router# show network-clocks
Priority 1 clock source(inactive config): T1 0
Priority 1 clock source(active config) : T1 0
```

```
Clock switch delay: 10
Clock restore delay: 10
T1 0 is clocking system bus for 9319 seconds.
Run Priority Queue: controller0
```

In this display, inactive configuration is the new configuration that has been established. Active configuration is the run-time configuration. Should an error be made in the new configuration, the inactive and active configurations will be different. In the previous example, the clock priority configuration is valid, and the system is being clocked as indicated.

The following is another sample output from the **shownetwork-clocks** command:

```
Router# show network-clocks
Priority 1 clock source(inactive config) : T1 0
Priority 2 clock source(inactive config) : T1 1
Priority 1 clock source(active config) : T1 0
Clock switch delay: 10
Clock restore delay: 10
T1 0 is clocking system bus for 9319 seconds.
Run Priority Queue: controller0
```

In this display, the new clocking configuration has an error for controller T1 1. This is indicated by checking differences between the last valid configuration (active) and the new proposed configuration (inactive). The error may result from hardware (the system controller board or MFT) unable to support this mode, or controller T1 1 is currently configured as "clock source internal."

Since the active and inactive configurations are different, the system will periodically display the warning message about the wrong configuration.

The following is another sample output from the **shownetwork-clocks** command for the 7600-ES+ITU-2TG or 7600-ES+ITU-4TG:

```
Router# show network-clocks
 Active source = Slot 1 BITS 0
 Active source backplane reference line = Primary Backplane Clock
 Standby source = Slot 9
 Standby source backplane reference line = Secondary Backplane Clock
(Standby source not driving backplane clock currently)
 All Network Clock Configuration
---------------------------------
 Priority  Clock Source           State                    Reason
 1       POS3/0/1                Valid but not present
 2       Slot 1 BITS 0           Valid
 3       Slot 9                  Valid
 Current operating mode is Revertive
 Current OOR Switchover mode is Switchover
There are no slots disabled from participating in network clocking
 BITS Port Configuration
------------------------
 Slot    Port    Signal Type/Mode        Line Build-Out Select
```
1 0 T1 ESF DSX-1 (533 to 655 feet)

	Command	Description
Related Commands	**clock source**	Specifies the interface clock source type.
	network-clock	Configures BITS port signaling types.

Command	Description
network-clock select	Selects a source of network clock.
network-clock-select (ATM)	Establishes the sources and priorities of the requisite clocking signals for an ATM-CES port adapter.
show platform hardware network-clocks	Displays network clocks for an ES+ line card.

show sscop

To show Service-Specific Connection-Oriented Protocol (SSCOP) details for all ATM interfaces, use the **show sscop**command in privileged EXEC mode.

show   sscop

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

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

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

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

Table 15: show sscop Field Descriptions

Field	Description
SSCOP details for interface	Interface slot and port.

Field	Description
Current State	SSCOP state for the interface.
Send Sequence Number	Current and maximum send sequence number.
Send Sequence Number Acked	Sequence number of packets already acknowledged.
Rcv Sequence Number	Sequence number of packets received.
Poll Sequence Number	Current poll sequence number.
Poll Ack Sequence Number	Poll sequence number already acknowledged.
Vt(Pd)	Number of sequenced data (SD) frames sent, which triggers a sending of a Poll frame.
Connection Control	Timer used for establishing and terminating SSCOP.
Keep Alive Timer	Timer used to send keepalives on an idle link.
Current Retry Count	Current count of the retry counter.
Maximum Retry Count	Maximum value the retry counter can take.
Pdu's Sent	Total number of SSCOP frames sent.
Pdu's Received	Total number of SSCOP frames received.
Pdu's Ignored	Number of invalid SSCOP frames ignored.
Begin	Number of Begin frames sent/received.
Begin Ack	Number of Begin Ack frames sent/received.
Begin Reject	Number of Begin Reject frames sent/received.
End	Number of End frames sent/received.
End Ack	Number of End Ack frames sent/received.
Resync	Number of Resync frames sent/received.
Resync Ack	Number of Resync Ack frames sent/received.
Sequenced Data	Number of Sequenced Data frames sent/received.
Sequenced Poll Data	Number of Sequenced Poll Data frames sent/received.
Poll	Number of Poll frames sent/received.
Stat	Number of Stat frames sent/received.
Unsolicited Stat	Number of Unsolicited Stat frames sent/received.
Unassured Data	Number of Unassured Data frames sent/received.

Field	Description
Mgmt Data	Number of Mgmt Data frames sent/received.
Unknown Pdu's	Number of Unknown Pdu's frames sent/received.

show svc

To display the Switched Virtual Circuits (SVC) information, use the **show svc** command in user EXEC or privileged EXEC mode.

show svc [{**ppp** | **interface***vpi/vci-valuevci-valueconnection-name*}]

Syntax Description		
ppp	(Optional) Specifies the Point-to-Point Protocol (PPP) ATM SVC interface information.
interface	(Optional) Specifies the interface for the SVC.
vpi **/** *vci-value*	(Optional) The Virtual Path Identifier or Virtual Channel Identifier (VPI/VCI) value. The forward slash is required.
vci-value	(Optional) The virtual circuit interface value.
connection-name	(Optional) The connection name.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.4(24)T	This command was introduced in a release earlier than Cisco IOS Release 12.4(24)T.

Usage Guidelines

Use this command to display the SVC information using the available keywords and arguments.

Examples

The following is sample output from the **show svc**command.

```
Router# show svc interface atm1/0
          VCD /                                          Peak   Av/Min  Burst
Interface Name          VPI  VCI Type   Encaps    SC    Kbps   Kbps    Cells   St
1/0        1138           0       125 SVC   SNAP      UBR  149760              UP
```

The table below describes the significant fields shown in the display.

Table 16: show svc Field Description

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.

Field	Description
Type	Type of PVC detected from PVC discovery; either PVC-D, PVC-L, or PVC-M: • PVC-D--PVC created as a result of PVC discovery. • PVC-L--The corresponding peer of this PVC could not be found on the switch. • PVC-M--Some or all of the quality of service (QOS) parameters of this PVC fail to match those of the corresponding peer on the switch.
Encaps	Type of ATM adaptation layer (AAL) and encapsulation.
Peak Kbps	Kilobits per second sent at the peak rate.
Avg/Min Kbps	Kilobits per second sent at the average rate.
Burst Cells	Maximum number of ATM cells that the VC can send at peak rate.
Sts	Status of the VC connection: • UP--The connection is enabled for data traffic. • DOWN--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 the State field provided below. • INACTIVE--The interface is down.
State	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: • 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.

snmp-server enable traps atm pvc

To enable the sending of ATM permanent virtual circuit (PVC) Simple Network Management Protocol (SNMP) notifications, use the **snmp-server enable traps atm pvc**command in global configuration mode. To disable ATM PVC-specific SNMP notifications, use the **no**form of this command.

snmp-server enable traps atm pvc [**interval** *seconds*] [**fail-interval** *seconds*]
no snmp-server enable traps atm pvc [**interval** *seconds*] [**fail-interval** *seconds*]

Syntax Description

interval *seconds*	(Optional) Specifies a minimum period between successive traps. Generation of PVC traps is dampened by the notification interval to prevent trap storms. No traps are sent until the interval lapses. The *seconds* argument is an integer in the range from 1 to 3600. The default is 30.
fail-interval *seconds*	(Optional) Specifies a minimum period for storing the failed time stamp. The *seconds* argument is an integer in the range from 0 to 3600. The default is 0.

Command Default

SNMP notifications are disabled.

Command Modes

Global configuration

Command History

Release	Modification
12.0(1)T	This command was introduced for the platforms that support ATM PVC Management.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.3	This command was integrated into Cisco IOS XE Software Release 2.3 and implemented on the Cisco ASR 1000 series routers.

Usage Guidelines

SNMP notifications can be sent as traps or inform requests. This command enables both traps and inform requests for the specified notification types. ATM notifications are defined in the CISCO-IETF-ATM2-PVCTRAP-MIB.my file, available from the Cisco FTP site at ftp://ftp.cisco.com/pub/mibs/v2/

ATM PVC failure notifications are sent when a PVC on an ATM interface fails or leaves the UP operational state. Only one trap is generated per hardware interface, within the specified interval defined by the **interval** keyword (stored as the atmIntfPvcNotificationInterval in the MIB). If other PVCs on the same interface go DOWN during this interval, traps are generated and held until the fail interval has elapsed. When the interval has elapsed, the traps are sent if the PVCs are still DOWN.

No notifications are generated when a PVC returns to the UP state after having been in the DOWN state. If you need to detect the recovery of PVCs, you must use the SNMP management application to regularly poll your router.

The **snmp-server enable traps atm pvc**command is used in conjunction with the **snmp-server host**command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications. To send notifications, you must configure at least one **snmp-server host**command.

Examples

The following example shows the enabling of ATM PVC traps on a router, so that if PVC 0/1 goes down, host 172.16.61.90 will receive the notifications:

```
!For ATM PVC Trap Support to work on your router, you must first have SNMP support and
!an IP routing protocol configured on your router:
Router(config)# snmp-server community public ro

Router(config)# snmp-server host 172.16.61.90 public

Router(config)# ip routing

Router(config)# router igrp 109

Router(config-router)# network 172.16.0.0

!
!Enable ATM PVC Trap Support and OAM management:
Router(config)# snmp-server enable traps atm pvc interval 40 fail-interval 10

Router(config)# interface atm 1/0.1

Router(config-if)# pvc 0/1

Router(config-if-atm-vc)# oam-pvc manage
```

Related Commands

Command	Description
show atm pvc	Displays all ATM PVCs and traffic information.
snmp-server enable traps	Enables all available SNMP notifications on your system.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server trap-source	Specifies the interface from which an SNMP trap should originate.

snmp-server enable traps atm pvc extension

To enable the sending of extended ATM permanent virtual circuit (PVC) SNMP notifications and SNMP notifications for ATM Operation, Administration, and Maintenance (OAM) F5 continuity check (CC), ATM OAM F5 alarm indication signals/remote defect indications (AIS/RDI), and loopback failures, use the **snmp-server enable traps atm pvc extension**command in global configuration mode. To disable these SNMP notifications, use the **no**form of this command.

snmp-server enable traps atm pvc extension {**up** | **down** | **oam failure** [{**aisrdi** | **endCC** | **loopback** | **segmentCC**}]}
no snmp-server enable traps atm pvc extension {**up** | **down** | **oam failure** [{**aisrdi** | **endCC** | **loopback** | **segmentCC**}]}

Syntax Description		
	up	Enables ATM PVC up traps. These notifications are generated when a PVC changes from the DOWN to the UP state.
	down	Enables ATM PVC failure traps. These notifications are generated when a PVC changes from the UP to the DOWN state.
	oam failure	Enables ATM PVC OAM failure traps. These notifications are generated when any type of OAM failure occurs on the PVC.
	aisrdi	(Optional) Enables AIS/RDI OAM failure traps. These notifications are generated when AIS/RDI OAM failure occurs on the PVC.
	endCC	(Optional) Enables end-to-end OAM CC failure traps. These notifications are generated when end-to-end CC failures occur on the PVC.
	loopback	(Optional) Enables OAM failure loopback traps. These notifications are generated when OAM loopback failure occurs on the PVC.
	segmentCC	(Optional) Enables segment OAM CC failure traps. These notifications are generated when segment CC failures occur on the PVC.

Command Default   SNMP notifications are disabled. The interval between successive traps is 30 seconds.

Command Modes

Global configuration (config)

Command History	Release	Modification
	12.2(4)T	This command was introduced for those platforms that support ATM PVC management.
	12.2(13)T	This command was modified to configure SNMP notification support for ATM OAM F5 CC and ATM OAM F5 AIS/RDI failures.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
	Cisco IOS XE Release 2.3	This command was integrated into Cisco IOS XE Software Release 2.3 and implemented on the Cisco ASR 1000 series routers.

Release	Modification
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

Usage Guidelines

For PVCs that are not part of a range, extended ATM PVC traps include virtual path identifier/virtual channel identifier (VPI/ VCI) information, the number of state transitions a PVC goes through in an interval, and the timestamp for the start and end of the transitions. For PVCs that are part of a range, extended ATM PVC traps include the first and last VPI/VCI of the range and the timestamp for the first failure and the last failure within the same range.

Extended ATM PVC and ATM OAM F5 CC traps cannot be used at the same time as the legacy ATM PVC trap. The legacy ATM PVC trap must be disabled by using the **no snmp-server enable traps atm pvc** command before extended ATM PVC traps can be configured.

The extended ATM PVC failure trap (which is enabled by the **snmp-server enable traps atm pvc extension down** command) is the same trap as the legacy ATM PVC failure trap (which is enabled by the **snmp-server enable traps atm pvc** command), but with the following differences:

- The extended ATM PVC failure trap contains information in the form of VPI/VCI ranges.

- The extended ATM PVC failure trap contains timestamps for when PVCs go down.

- The legacy ATM PVC failure trap contains only one VPI/VCI per trap.

Note

You must configure the **snmp-server enable traps atm pvc extension mibversion 2**command before you can enable the ATM OAM F5 AIS/RDI failure traps, the end-to-end ATM OAM F5 CC failure traps, the OAM failure loopback traps, and the segment ATM OAM F5 CC failure traps. This command enables the MIB that supports these traps.

OAM management must be enabled on the PVC before you can use ATM PVC traps. To generate F5 loopback failure traps, enable OAM management using the **oam-pvc manage** command. To generate segment F5 CC failure traps, enable segment OAM CC management by using the **oam-pvc manage cc segment** command. To generate end-to-end F5 CC failure traps, enable end-to-end OAM CC management by using the **oam-pvc manage cc end** command. To generate OAM F5 AIS/RDI failure traps, enable any of the three types of OAM management listed above.

SNMP notifications can be sent as traps or inform requests. This command enables both traps and inform requests for the specified notification types. The interval between successive traps is 30 seconds.

The extended ATM PVC notifications for MIB version 1 are defined in the CISCO-IETF-ATM2-PVCTRAP-MIB.my file.The extended ATM PVC notifications for MIB version 2 are defined in the CISCO-ATM-PVCTRAP-EXTN-MIB.my file. Both of these MIB files are available from the Cisco FTP site at ftp://ftp.cisco.com/pub/mibs/v2/ .

ATM PVC traps are generated at the end of the notification interval. It is possible to generate all three types of ATM PVC traps (the ATM PVC failure trap, ATM PVC up trap, and ATM PVC OAM failure trap) at the end of the same notification interval; however, only one type of trap will be generated for each PVC.

The **snmp-server enable traps atm pvc extension**command is used in conjunction with the **snmp-server host**command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications. In order to send notifications, you must configure at least one **snmp-server host**command.

When the ATM OAM F5 loopback, AIS/RDI, or CC failure trap is enabled, the PVC remains in the UP state when an OAM loopback, AIS/RDI, or CC failure is detected, so that the flow of data will still be possible. If one of these traps is not enabled, the PVC will be placed in the DOWN state when an OAM loopback, AIS/RDI, or CC failure is detected.

Examples

Extended ATM PVC Notifications

The following example shows all three of the extended ATM PVC traps enabled on a router. If PVC 0/1 leaves the UP state, leaves the DOWN state, or has an OAM loopback failure, host 172.16.61.90 will receive the SNMP notifications:

```
! Configure SNMP support and an IP routing protocol on your router:
Router(config)# snmp-server community public ro
Router(config)# snmp-server host 172.16.61.90 public
Router(config)# ip routing
Router(config)# router igrp 109
Router(config-router)# network 172.16.0.0
!
! Enable extended ATM PVC trap support and OAM management:
Router(config)# snmp-server enable traps atm pvc extension down
Router(config)# snmp-server enable traps atm pvc extension up
Router(config)# snmp-server enable traps atm pvc extension oam failure loopback
Router(config)# interface atm 1/0.1
Router(config-if)# pvc 0/1
Router(config-if-atm-vc)# oam-pvc manage
```

Extended ATM PVC Failure Trap Output

The following example shows output for extended ATM PVC failure trap for PVCs 1/100, 1/102, and 1/103. Note that only one trap is generated for all the PVCs associated with the same interface or subinterface (in contrast to the legacy ATM PVC failure trap, which generates a separate trap for each PVC). The VPI/VCI information and timing information are located in the objects associated with the trap.

```
00:23:56:SNMP:Queuing packet to 10.1.1.1
00:23:56:SNMP:V2 Trap, reqid 2, errstat 0, erridx 0
sysUpTime.0 = 143636
snmpTrapOID.0 = atmIntfPvcFailuresTrap
ifEntry.1.19 = 19
atmIntfPvcFailures.2 = 7
atmIntfCurrentlyFailingPVcls.2 = 3
atmPVclLowerRangeValue.19.1.2 = 102
atmPVclHigherRangeValue.19.1.2 = 103
atmPVclRangeStatusChangeStart.19.1.2 = 140643
atmPVclRangeStatusChangeEnd.19.1.2 = 140698
atmPVclStatusTransition.19.1.100 = 1
atmPVclStatusChangeStart.19.1.100 = 140636
atmPVclStatusChangeEnd.19.1.100 = 140636
00:23:56:SNMP:Packet sent via UDP to 10.1.1.1
```

Extended ATM PVC Up Trap Output

The following example shows output for the extended ATM PVC up trap for PVCs 1/100, 1/102, and 1/103:

```
00:31:29:SNMP:Queuing packet to 10.1.1.1
00:31:29:SNMP:V2 Trap, reqid 2, errstat 0, erridx 0
sysUpTime.0 = 188990
snmpTrapOID.0 = atmIntfPvcUpTrap
ifEntry.1.19 = 19
atmIntfCurrentlyDownToUpPVcls.2 = 3
atmPVclLowerRangeValue.19.1.2 = 102
atmPVclHigherRangeValue.19.1.2 = 103
atmPVclRangeStatusChangeStart.19.1.2 = 186005
atmPVclRangeStatusChangeEnd.19.1.2 = 186053
atmPVclStatusTransition.19.1.100 = 1
atmPVclStatusChangeStart.19.1.100 = 185990
atmPVclStatusChangeEnd.19.1.100 = 185990
00:31:30:SNMP:Packet sent via UDP to 10.1.1.1
```

ATM OAM F5 CC Notifications

In the following example, the ATM OAM CC notifications and an extended ATM PVC notification are enabled. If connectivity failures are detected on PVC 0/1, host 172.16.61.90 will receive the SNMP notifications:

```
! Configure SNMP support and an IP routing protocol on your router:
Router(config)# snmp-server community public ro
Router(config)# snmp-server host 172.16.61.90 public
Router(config)# ip routing
Router(config)# router igrp 109
Router(config-router)# network 172.16.0.0
!
! Enable extended ATM PVC trap support and OAM management:
Router(config)# snmp-server enable traps atm pvc extension mibversion 2
Router(config)# snmp-server enable traps atm pvc extension oam failure aisrdi
Router(config)# snmp-server enable traps atm pvc extension oam failure endcc
Router(config)# snmp-server enable traps atm pvc extension oam failure segmentcc
Router(config)# snmp-server enable traps atm pvc extension oam failure loopback
Router(config)# snmp-server enable traps atm pvc extension up
Router(config)# interface atm 0
Router(config-if)# pvc 0/1
Router(config-if-atm-vc)# oam-pvc manage cc end
```

Related Commands

Command	Description
oam-pvc manage	Enables end-to-end F5 OAM loopback cell generation and OAM management.
oam-pvc manage cc	Configures ATM OAM F5 CC management.
show atm pvc	Displays all ATM PVCs and traffic information.
snmp-server enable traps	Enables all available SNMP notifications on your system.

Command	Description
snmp-server enable traps atm pvc	Enables the sending of legacy ATM PVC failure traps.
snmp-server enable traps atm pvc extension mibversion	Specifies the MIB that supports extended ATM PVC SNMP notifications or the MIB that supports SNMP notifications for ATM OAM F5 CC, F5 AIS/RDI, and F5 loopback failures.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server trap-source	Specifies the interface from which an SNMP trap should originate.

snmp-server enable traps atm pvc extension mibversion

To specify the MIB that supports extended ATM permanent virtual circuit (PVC) Simple Network Management Protocol (SNMP) notifications or the MIB that supports SNMP notifications for ATM Operation, Administration, and Maintenance (OAM) F5 continuity check (CC) management, ATM OAM F5 AIS/RDI management, and F5 loopback failure management, use the **snmp-server enable traps atm pvc extension mibversion** command in global configuration mode. To remove the MIB specification, use the **no** form of this command.

snmp-server enable traps atm pvc extension mibversion {**1** | **2**}
no snmp-server enable traps atm pvc extension mibversion {**1** | **2**}

Syntax Description	**1**	Specifies the MIB that supports the extended ATM permanent virtual circuit (PVC) SNMP notifications. This is the default.
	2	Specifies the MIB that supports ATM OAM F5 CC and ATM OAM F5 AIS/RDI SNMP notifications, in addition to the notifications supported by MIB version 1.

Command Default

SNMP notifications **are disabled.**

Command Modes

Global configuration

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Usage Guidelines

MIB version 1 specifies the MIB that supports legacy extended ATM PVC traps and is defined in the file CISCO-IETF-ATM2-PVCTRAP-MIB-EXTN.my. MIB version 1 is implemented by default. Use the **snmp-server enable traps atm pvc extension mibversion 1** command or the **no snmp-server enable traps atm pvc** extens**ion mibversion 2** command to reenable this MIB if it was previously disabled with the **snmp-server enable traps atm pvc extension mibversion 2** command.

Use the **snmp-server enable traps atm pvc** extens**ion mibversion 2** command to specify the MIB that supports ATM OAM F5 CC and ATM OAM AID/RDI failure notifications. This MIB is defined in the file CISCO-ATM-PVCTRAP-EXTN-MIB.my.

To enable the SNMP notifications that support ATM OAM F5 continuity checking, use the **snmp-server enable traps atm pvc** extens**ion** command in global configuration mode. These SNMP notifications are defined in the file CISCO-ATM-PVCTRAP-EXTN-MIB.my, available from the Cisco FTP site at ftp://ftp.cisco.com/pub/mibs/v2/

OAM management and support for OAM F5 continuity checking must be enabled on the PVC by using the oam-pvc manage cc command before you can use the ATM OAM continuity check SNMP notifications.

Examples

In the following example, the MIB that supports the SNMP notifications for ATM OAM continuity checking is implemented, and the ATM OAM continuity checking notifications are enabled. Support for end-to-end OAM F5 continuity checking is enabled on PVC 0/1:

```
Router(config)# snmp-server enable traps atm pvc extension mibversion 2
Router(config)# snmp-server enable traps atm pvc extension oam failure aisrdi
Router(config)# snmp-server enable traps atm pvc extension oam failure endcc
Router(config)# snmp-server enable traps atm pvc extension oam failure segmentcc
Router(config)# snmp-server enable traps atm pvc extension oam failure loopback
Router(config)# snmp-server enable traps atm pvc extension up
Router(config)# interface atm 0
Router(config-if)# pvc 0/40
Router(config-if-atm-vc)# oam-pvc manage cc end
```

Related Commands

Command	Description
debug atm oam cc	Displays ATM OAM F5 CC management activity.
oam-pvc manage cc	Configures ATM OAM F5 CC management.
snmp-server enable traps	Enables all available SNMP notifications on your system.
snmp-server enable traps atm pvc	Enables the sending of legacy ATM PVC DOWN traps.
snmp-server enable traps atm pvc extension	Enables the sending of extended ATM PVC SNMP notifications and SNMP notifications for ATM OAM F5 CC, ATM OAM F5 AIS/RDI, and loopback failures.

snmp-server enable traps atm subif

To enable Simple Network Management Protocol (SNMP) traps (notifications) for ATM subinterfaces, use the **snmp-server enable traps atm subif** command in global configuration mode. To disable ATM subinterface-specific SNMP traps, use the **no** form of this command.

snmp-server enable traps atm subif [**count max-traps**] [**interval** *seconds*]
no snmp-server enable traps atm subif [**count max-traps**] [**interval** *seconds*]

Syntax Description

count	(Optional) Specifies the maximum number of traps that will be sent in the specified interval.
max-traps	(Optional) Number of traps. The range is from 1 to 1000. The default is 10.
interval	(Optional) Specifies the minimum period between successive traps.
seconds	(Optional) Interval, in seconds. The range is from 0 to 3600. The default is 10.

Command Default

ATM subinterface SNMP traps are disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(13)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(33)SRE6	This command was modified. To enable the sending of ATM subinterface SNMP notifications, after this command is configured in global configuration mode, the **snmp trap link-status** command must be configured on each ATM subinterface.
15.1(3)S3	This command was integrated in Cisco IOS Release 15.1(3)S3.

Usage Guidelines

The **snmp-server trap link ietf** command must be configured in order to use the **snmp-server enable traps atm subif** command. The **snmp-server trap link ietf** command is used to configure a router to use the RFC 2233 IETF standards-based implementation of linkUp/linkDown traps. The default Cisco object definitions do not generate linkUp/linkDown traps correctly for subinterfaces.

In order to enable SNMP notifications for ATM subinterfaces, after the **snmp-server enable traps atm subif** command has been configured in global configuration mode, the **snmp trap link-status** command must be configured on each ATM subinterface for which you want to enable SNMP notifications.

SNMP notifications can be sent as traps or inform requests. This command enables both traps and inform requests for the specified notification types.

ATM subinterface traps are sent to the network management system (NMS) when a subinterface enters or leaves the down state.

To prevent trap storms, the **count** and **interval** keywords can be configured to limit the number of traps and the frequency at which they are sent. Configuring an interval of 0 seconds causes all ATM subinterface traps to be sent.

You can disable ATM subinterface traps by using the **no snmp-server enable traps atm subif** command. When traps are disabled, you can use the SNMP management application to poll your router for subinterface status information.

The **snmp-server enable traps atm subif** command is used in conjunction with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications. To send notifications, you must configure at least one **snmp-server host** command.

By default (when the **snmp-server enable traps atm subif** command is not configured), the ifLinkUpDownTrapEnable object returns disabled(2), and no traps are generated for the subinterfaces.

When the **snmp-server enable traps atm subif** command is configured, the ifLinkUpDownTrapEnable object is set to enabled(1) for all the ATM AAL5 layers of the subinterfaces. To verify that the traps are generated (with the **debug snmp packets** command enabled), enter the **shutdown** or **no shutdown** commands to display the traps.

Configuring the **snmp trap link-status** command on a subinterface generates the traps and sets the ifLinkUpDownTrapEnable object to enabled(1). If the **snmp trap link-status** command is not configured on the subinterface, the ifLinkUpDownTrapEnable object is set to disabled(2) for that subinterface, and the **shutdown** or **no shutdown** commands no longer generate traps for that subinterface.

Examples

The following example shows how to enable ATM subinterface traps on a device. If an ATM subinterface on this device changes state, host 172.16.61.90 will receive the notifications.

```
! For ATM subinterface trap to work on your router, you must first have SNMP support and
! an IP routing protocol configured on your router.
Device(config)# snmp-server community public ro

Device(config)# snmp-server host 172.16.61.90 public
Device(config)# snmp-server trap link ietf
Device(config)# snmp-server enable traps snmp
Device(config)# ip routing

Device(config)# router igrp 109

Device(config-router)# network 172.16.0.0

! Enable ATM subinterface trap support.
Device(config)# snmp-server enable traps atm subif count 5 interval 60
```

Related Commands

Command	Description
snmp-server enable traps	Enables all available SNMP traps on your system.
snmp-server enable traps atm pvc	Enables the sending of ATM PVC SNMP notifications.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server trap link ietf	Enables linkUp/linkDown SNMP traps that are compliant with RFC 2233.
snmp-server trap-source	Specifies the interface from which an SNMP trap should originate.

Command	Description
snmp trap link-status	Enables SNMP link trap generation.

sscop cc-timer

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

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

Syntax Description

seconds	Number of seconds between Begin messages.

Command Default 1 second

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines The connection control timer determines the time between transmission of BGN (establishment), END (release), or RS (resynchronization) protocol data units (PDUs) as long as an acknowledgment has not been received.

Examples The following example sets the connection control timer 15 seconds:

```
sscop cc-timer 15
```

Related Commands

Command	Description
sscop max-cc	Changes the SSCOP retry count of connection control.

sscop keepalive-timer

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

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

Syntax Description

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

Command Default   5 seconds

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example sets the keepalive timer to 15 seconds:

```
sscop keepalive-timer 15
```

sscop max-cc

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

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

Syntax Description

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

Command Default

10 retries

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example sets the retry count of the connection control to 20:

```
sscop max-cc 20
```

Related Commands

Command	Description
sscop cc-timer	Changes the SSCOP connection control timer.

sscop poll-timer

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

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

Syntax Description	*seconds*	Number of seconds that the router waits between transmission of POLL PDUs.

Command Default

100 seconds

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

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

Examples

The following example sets the poll timer to 15 seconds:

```
sscop poll-timer 15
```

sscop receive-window

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

sscop receive-window *packets*
no sscop receive-window

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

Syntax Description

Command Default   7 packets

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example sets the receiver's window to 10 packets:

```
sscop rcv-window 10
```

sscop send-window

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

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

Syntax Description

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

Command Default   7 packets

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example sets the transmitter's window to 10 packets:

```
sscop send-window 10
```

SVC

To create an ATM switched virtual circuit (SVC) and specify the destination network service access point (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*] [**ces**]
no svc [*name*] [**nsap** *address*] [**ces**]

Syntax Description

name	(Optional) The name of the SVC and map. The name can be up to 16 characters long. A name is required when creating passive a CES SVC.
nsap *address*	(Optional) The destination ATM NSAP address. Must be exactly 40 hexadecimal digits long and in the correct format. See the "Usage Guidelines" section. An NSAP address is required when creating an active CES SVC.
ces	(Optional) Circuit Emulation Service encapsulation. This keyword is available on the OC-3/STM-1 ATM Circuit Emulation Service network module only.

Command Default

No NSAP address is defined.

Command Modes

Interface configuration

Command History

Release	Modification
11.3	This command was introduced.
12.1(2)T	The **ces** keyword was added to configure CES encapsulation when using the OC-3/STM-1 ATM Circuit Emulation Service network module on Cisco 2600 and Cisco 3600 series platform.
12.1(3)T	This command was modified to allow an SVC to be created without having a specific NSAP address associated with it.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

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

Once you specify a *name* for an SVC, you can reenter the interface-ATM-VC or interface-CES-VC configuration mode by simply entering **svc** *name*.

You can remove an NSAP address and any associated parameters by entering **no svc** *name* or **no svc** *nsap address*.

Creating an SVC without a specific NSAP address will allow a router to accept calls from any ATM address, and allow multiple VCs to be set up using the same configuration.

Use the **ces** keyword to configure an active or passive CES SVC. An active CES SVC can originate and terminate SVC calls. A passive CES SVC can only terminate calls.

Note Cisco IOS does not support creation of SVCs on a point-to-point interface.

Examples

SVC Example

The following example creates an SVC called "chicago" on ATM interface 2/0/0:

```
interface atm 2/0/0
  svc chicago
```

SVC with NSAP Address 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
```

Active CES SVC Example

The following example creates an active CES SVC named "ces1":

```
interface atm 1/0
  svc ces1 nsap 47.00.00.000000.0040.0B0A.2501.ABC1.01.01.00 ces
```

Passive CES SVC Example

The following example creates a passive CES SVC named "ces2":

```
interface atm 1/0
  svc ces2 ces
```

transmit-priority

To configure the transmit priority for a virtual circuit (VC), use the **transmit-priority** command in VC configuration mode. To configure the VC or PVC for its default transmit priority, use the **no** form of this command.

transmit-priority *level*
no   transmit-priority

Syntax Description

level	Configures the PVC for the specified transmit priority level. The valid range is from 1 to 6. The default value is determined by the VC's configured quality of service (QoS) class, which in turn is determined by the specified ATM interface.

Command Default   Each VC is configured with the default transmit priority for its configured QoS class (see the table below).

Command Modes

VC configuration mode

Command History

Release	Modification
11.1(22)CC	This command was introduced for the PA-A3 ATM port adapters.
12.(0)4	Support was added for the PA-A3 ATM port adapters on Catalyst 5000 family switches with Catalyst RSM/VIP processor card.
12.0(7)XR	Support was added for the PA-A3 ATM port adapters on Cisco uBR7200 series routers.
12.1(1)EX	Support was added for the PA-A3 ATM port adapters on Catalyst 6000 family switches with Catalyst 6000 family FlexWAN module.
12.2(2)T	Support was added for the PA-A3 ATM port adapters on Cisco 7000 and Cisco 7500 series routers using a VIP2-40 or greater processor card.
12.2(4)	The maximum priority level for the PA-A3 port adapters was increased from 4 to 6, so that the valid range is now 1 to 6.
12.2(11)YZ	Support was added for the PA-A3 ATM port adapters on Cisco 7300 series routers.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE to support the 2-Port and 4-Port OC-3c/STM-1 ATM SPA and the 1-Port OC-12c/STM-4 ATM SPA shared port adapters on the Cisco 7600 series routers and Catalyst 6500 series switches.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   By default, permanent virtual circuits (PVC) and switch virtual circuits (SVCs) that are created on PA-A3 ATM port adapters and ATM shared port adapters (SPA) use a default transmit priority level that depends on the VC's or PVC's configured quality of service (QoS) class. The following table lists the default transmit priority levels for each type of service class.

Table 17: Default Transmit Priorities for Each ATM Service Class

Transmit Priority	Service Category	
PA-A3-OC3, PA-A3-DS3 Port Adapters	ATM Shared Port Adapter (SPA)	
0 (highest)	CBR[1], OAM[2] cells, and Signaling	Signaling, and OAM and other control cells
1	AAL5[3] or AAL2[4] VoATM[5] (any service category)	CBR when greater than half of the line rate
2	VBR-rt[6]	CBR when less than half of the line rate
3	VBR-nrt[7]	Voice traffic
4	ABR[8]	VBR-rt
5	UBR[9]	VBR-nrt
6	Not Supported	UBR
7 (lowest)	Not Supported	Unused

[1] CBR=Constant Bit Rate
[2] OAM=Operation, Administration, and Maintenance
[3] AAL5=Asynchronous Transfer Mode Adaption Layer 5
[4] AAL2=Asynchronous Transfer Mode Adaption Layer 2
[5] VoATM=Voice over ATM
[6] VBR-rt=Variable Bit Rate-Real Time
[7] VBR-nrt=Variable Bit Rate-Non-Real Time
[8] ABR=Available Bit Rate
[9] UBR=Unspecified Bit Rate

To change these default transmit priority levels for a particular VC or PVC, use the **transmit-priority** command.

The **transmit-priority** command is not supported in the following cases:

- The PA-A3 ATM port adapters reserve priority 0 (the highest) for CBR traffic and for OAM and other control cells. You cannot change the transmit priority for this traffic. You also cannot configure other service classes for priority 0.

- You cannot use the **transmit-priority** command for VCs on a shaped virtual path (VP) on an ATM SPA

- The PA-A3-OC12 port adapter does not support the **transmit-priority** command.

Tip Use the **show atm pvc** and **show atm svc** commands to display the current transmit priority for a PVC or SVC.

Examples

The following example shows the **transmit-priority** command being used to change the priority for a PVC on a PA-A3 ATM port adapter. The PVC is configured for the VBR-rt service class, which has a default transmit priority level of 2, but the **transmit-priority** command changes the priority level to 3:

```
Router# configure terminal

Router(config)# interface atm 3/0.10

Router(config)# pvc 10/1

Router(config-if-atm-vc)# vbr-rt 48 48

Router(config-if-atm-vc)# transmit-priority 3

Router(config-if-atm-vc)# end

Router#
```

The following example shows the **transmit-priority** command being used to change the priority for a PVC on an ATM SPA. Because the PVC defaults to the UBR service class, its default transmit priority is configured to 6, but the **transmit-priority** command changes the priority level to 4:

```
Router# configure terminal

Router(config)# interface atm 4/1/3

Router(config-if)# pvc 1/100

Router(config-if-atm-vc)# transmit-priority 4

Router(config-if-atm-vc)# end

Router#
```

Note The maximum configurable transmit priority through VC class is 6, but only on an IMA interface the maximum applicable transmit priority level is 4. If you configure more than the applicable transmit priority, the priority level falls back to the maximum applicable transmit priority.

Related Commands

Command	Description
show atm pvc	Displays the configuration of a particular permanent virtual circuit (PVC).
show atm svc	Displays the configuration of a particular switched virtual circuit (SVC).

tx-limit

To specify the number of transmit buffers for an ATM virtual circuit (VC), use the **tx-limit** command in ATM VC, VC-bundle, VC-class, or VC-range configuration mode. To reset the number of transmit buffers for a particular VC to the default value, use the **no** form of this command.

tx-limit *buffers*
no tx-limit

Syntax Description	

buffers	Specifies the number of buffers to be used for this VC. The valid range is 1 to 57343, with a default value that is based on the current VC line rate.

Command Default

Automatically computed from the VC line rate to produce a default latency of 100 milliseconds (or whatever value is specified by the **atm tx-latency** command).

Command Modes

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

VC-bundle configuration

VC-class configuration

VC-range configuration

Command History

Release	Modification
12.2(18)SXE	This command was introduced for the ATM Shared Port Adapters (SPA) on Catalyst 6500 series switches and Cisco 7600 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

When you configure a VC on an ATM SPA interface, the Cisco IOS software automatically determines the maximum number of transmit buffers that are needed by the VC for its outgoing traffic. The Cisco IOS software uses both the configured VC line rate and latency value to calculate the number of buffers. Each transmit buffer can contain an ATM cell (53 bytes).

By default, each VC uses the latency value that is specified by the **atm tx-latency** command, which defaults to 100 milliseconds. The maximum number of transmit buffers is then calculated, so that traffic at the maximum VC line rate can still be transmitted within this latency value.

If a particular VC's traffic flow requires a different latency value, use the **tx-limit** command to manually configure the number of transmit buffers for that VC. This allows you to fine-tune the latency value on a per-VC basis, without affecting the other VCs on the interface.

Tip   Use the **atm tx-latency** command to specify the default latency value for all VCs on the interface, and then use the **tx-limit** command to fine-tune the configuration for a particular VC, as needed.

Note   The number of buffers can also be affected by the packet size, because each VC is always allowed to transmit at least one packet, regardless of the number of buffers configured with the **tx-limit** command. If the number of buffers specified by the **tx-limit** command is very small, and the VC must transmit a very large packet, the interface can increase the number of buffers for the VC to whatever number can accommodate the packet's size. This means that occasionally, the number of buffers can grow to whatever number can accommodate a packet up to the maximum MTU size.

Note   Other ATM interfaces have used the **tx-ring-limit** command to achieve a similar result, but this command is not supported on ATM SPA interfaces, because it does not apply to the SPA architecture.

Examples   The following example shows an ATM VC being configured for a maximum of 500 buffers:

```
Router# configure terminal

Router(config)# interface atm 4/0/0.10 point-to-point

Router(config-subif)# pvc 10/101

Router(config-if-atm-vc)# tx-limit 500

Router(config-if-atm-vc)#
```

The following example shows an ATM VC being reset for its default buffer value, which will be whatever buffer size is needed, at the VC line rate, to produce a default latency of 100 milliseconds (or whatever value is specified by the **atm tx-latency** command):

```
Router# configure terminal

Router(config)# interface atm 3/0/1.10 point-to-point

Router(config-subif)# pvc 10/20

Router(config-if-atm-vc)# no tx-limit
Router(config-if-atm-vc)#
```

Related Commands

Command	Description
atm tx-latency	Specifies the default transmit latency for an ATM Shared Port Adapter (SPA) interface.

ubr+

To configure unspecified bit rate (UBR) quality of service (QoS) and specify the output peak cell rate and output minimum guaranteed cell rate for an ATM permanent virtual circuit (PVC), PVC range, switched virtual circuit (SVC), virtual circuit (VC) class, or VC bundle member, use the **ubr+** command in the appropriate command mode. To remove the UBR+ parameters, use the **no** form of this command.

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

Syntax Description		
	output-pcr	The output peak cell rate (PCR) in kbps.
	output-mcr	The output minimum guaranteed cell rate in kbps.
	input-pcr	(Optional for SVCs only) The input PCR in kbps. If this value is omitted, the *input-pcr* equals the *output-pcr*.
	input-mcr	(Optional for SVCs only) The input minimum guaranteed cell rate in kbps. If this value is omitted, the *input-mcr* equals the *output-mcr*.

Command Default UBR QoS is at the maximum line rate of the physical interface.

Command Modes

Interface-ATM-VC configuration (for an ATM PVC on non-DSL interfaces only or an ATM SVC on non-DSL interfaces only)
VC-class configuration (for a VC class)
Bundle-VC configuration (for ATM VC bundle members)
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 was enhanced to support selection of UBR+ QoS and configuration of output PCR and output minimum guaranteed cell rate for ATM VC bundles and VC bundle members.
	12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.
	12.4(2)XA	This command was enabled on DSL ATM interfaces.
	12.4(6)T	This command was enabled on DSL ATM interfaces.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

ubr+

Usage Guidelines

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

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

If the **ubr+** command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (in order of 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 ATM subinterface or SVC ATM subinterface

- Configuration of any QoS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC main interface or SVC ATM main interface

- Global default: UBR QoS at the maximum line rate of the PVC or SVC

To use this command in VC-class configuration mode, enter the **vc-class atm** global configuration command before you enter the **ubr+** command. This command has no effect if the VC class that contains the command is attached to a standalone VC (meaning a VC that is not a bundle member).

To use this command in bundle-VC configuration mode, enter the **bundle** command to specify the bundle to which the VC member belongs, then enter bundle configuration mode. Finally, enter the **pvc-bundle** bundle configuration command to add the VC to the bundle as a member.

VCs in a VC bundle use the following configuration inheritance rules (in order of next-highest precedence):

- VC configuration in bundle-VC mode

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

- Subinterface configuration in subinterface mode

DSL ATM interfaces do not support switched virtual circuits (SVCs).

Examples

The following example configures UBR+ PVC on a DSL line:

```
interface atm 0/0
 pvc 4/100
  ubr+ 2304 2304
```

The following example specifies the *output-pcr* argument for an ATM PVC to be 100000 kbps and the *output-mcr* to be 3000 kbps:

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

The following example specifies the *output-pcr*, *output-mcr*, *input-pcr,* and *input-mcr* arguments for an ATM SVC to be 10000 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

Command	Description
abr	Selects ABR QoS and configures the output peak cell rate and the output minimum guaranteed cell rate for an ATM PVC or VC class.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
bump	Configures the bumping rules for a VC class that can be assigned to a VC bundle.
bundle	Creates a bundle or enters bundle configuration mode to modify an existing bundle.
class	Assigns a VC class to an ATM main interface, subinterface, PVC, SVC, VC bundle, or VC bundle member.
encapsulation	Sets the encapsulation method used by the interface.
inarp	Configures the InARP 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 VC class that can be applied to a VC bundle.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
precedence	Configures precedence levels for a VC class that can be assigned to a VC bundle and thus applied to all VC members of that bundle.
protect	Configures a VC class with protected group or protected VC status for application to a VC bundle member.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle.
pvc-bundle	Adds a PVC to a bundle as a member of the bundle and enters bundle-VC configuration mode to configure that PVC bundle member.
ubr	Configures UBR QoS and specifies the output peak 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.
vbr-rt	Configures variable bit rate real-time for VoATM voice connections.

ubr+

To configure unspecified bit rate (UBR) quality of service (QoS) and specify the output peak cell rate and output minimum guaranteed cell rate for an ATM permanent virtual circuit (PVC), PVC range, switched virtual circuit (SVC), virtual circuit (VC) class, or VC bundle member, use the **ubr+** command in the appropriate command mode. To remove the UBR+ parameters, use the **no** form of this command.

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

Syntax Description

output-pcr	The output peak cell rate (PCR) in kbps.
output-mcr	The output minimum guaranteed cell rate in kbps.
input-pcr	(Optional for SVCs only) The input PCR in kbps. If this value is omitted, the *input-pcr* equals the *output-pcr*.
input-mcr	(Optional for SVCs only) The input minimum guaranteed cell rate in kbps. If this value is omitted, the *input-mcr* equals the *output-mcr*.

Command Default

UBR QoS is at the maximum line rate of the physical interface.

Command Modes

Interface-ATM-VC configuration (for an ATM PVC on non-DSL interfaces only or an ATM SVC on non-DSL interfaces only)
VC-class configuration (for a VC class)
Bundle-VC configuration (for ATM VC bundle members)
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 was enhanced to support selection of UBR+ QoS and configuration of output PCR and output minimum guaranteed cell rate for ATM VC bundles and VC bundle members.
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.
12.4(2)XA	This command was enabled on DSL ATM interfaces.
12.4(6)T	This command was enabled on DSL ATM interfaces.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

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

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

If the **ubr**+command is not explicitly configured on an ATM PVC or SVC, the VC inherits the following default configuration (in order of 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 ATM subinterface or SVC ATM subinterface

- Configuration of any QoS command (**ubr**, **ubr+**, or **vbr-nrt**) in a VC class assigned to the PVC main interface or SVC ATM main interface

- Global default: UBR QoS at the maximum line rate of the PVC or SVC

To use this command in VC-class configuration mode, enter the **vc-class atm** global configuration command before you enter the **ubr**+ command. This command has no effect if the VC class that contains the command is attached to a standalone VC (meaning a VC that is not a bundle member).

To use this command in bundle-VC configuration mode, enter the **bundle** command to specify the bundle to which the VC member belongs, then enter bundle configuration mode. Finally, enter the **pvc-bundle**bundle configuration command to add the VC to the bundle as a member.

VCs in a VC bundle use the following configuration inheritance rules (in order of next-highest precedence):

- VC configuration in bundle-VC mode

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

- Subinterface configuration in subinterface mode

DSL ATM interfaces do not support switched virtual circuits (SVCs).

Examples

The following example configures UBR+ PVC on a DSL line:

```
interface atm 0/0
 pvc 4/100
  ubr+ 2304 2304
```

The following example specifies the *output-pcr* argument for an ATM PVC to be 100000 kbps and the *output-mcr* to be 3000 kbps:

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

The following example specifies the *output-pcr*, *output-mcr*, *input-pcr,*and *input-mcr* arguments for an ATM SVC to be 10000 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

Command	Description
abr	Selects ABR QoS and configures the output peak cell rate and the output minimum guaranteed cell rate for an ATM PVC or VC class.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
bump	Configures the bumping rules for a VC class that can be assigned to a VC bundle.
bundle	Creates a bundle or enters bundle configuration mode to modify an existing bundle.
class	Assigns a VC class to an ATM main interface, subinterface, PVC, SVC, VC bundle, or VC bundle member.
encapsulation	Sets the encapsulation method used by the interface.
inarp	Configures the InARP 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 VC class that can be applied to a VC bundle.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
precedence	Configures precedence levels for a VC class that can be assigned to a VC bundle and thus applied to all VC members of that bundle.
protect	Configures a VC class with protected group or protected VC status for application to a VC bundle member.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle.
pvc-bundle	Adds a PVC to a bundle as a member of the bundle and enters bundle-VC configuration mode to configure that PVC bundle member.
ubr	Configures UBR QoS and specifies the output peak 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.
vbr-rt	Configures variable bit rate real-time for VoATM voice connections.

ubr+ cos

To map the class of service (CoS) value or range of values to an unspecified bit rate plus (UBR+) virtual channel connection (VCC), use the **ubr+ cos** command in LANE QoS database configuration mode. To revert to the default value or range, use the **no** form of this command.

ubr+ cos {*value* | *range*}

no ubr+ cos {*value* | *range*}

Syntax Description

value	A single CoS value.
range	A range of CoS values.

Command Default

The default CoS range for a UBR+ VCC is 4 to 7.

Command Modes

LANE QoS database configuration

Command History

Release	Modification
12.1(2)E	This command was introduced.
12.1(4)E2	This command was modified to include support for the Catalyst 6000 family ATM module and the Catalyst 5000 family ATM module operating in trusted mode.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines

This command is supported only on the router platforms until Cisco IOS Release 12.1(4)E1. In Cisco IOS Release 12.1(4)E1, this command is supported on all platforms running the QoS over LANE feature, with the lone exception of the Catalyst 5000 family ATM module operating in untrusted mode.

All packets matching the specified CoS values are sent on the UBR+ VCC. A single **ubr+ cos** command can be entered in a database. All network services access point (NSAP) addresses in that database use the same mapping. If a different mapping is required, a separate database needs to be created.

You can configure multiple CoS values by entering individual CoS values separated by commas, or by entering a range of CoS values, separated by a hyphen.

Examples

In the following example, the CoS value is mapped to 1 and 3 to 5:

```
Router(lane-qos)# ubr+ cos 1,3-5
```

Related Commands

Command	Description
atm-address	Specifies the QoS parameters associated with a particular ATM address.
lane client qos	Applies a QoS over LANE database to an interface.
lane qos database	Begins the process of building a QoS over LANE database.

Command	Description
show lane qos database	Displays the contents of a specific QoS over LANE database.

vbr-nrt

To configure the variable bit rate-nonreal time (VBR-NRT) quality of service (QoS) and specify output peak cell rate (PCR), output sustainable cell rate (SCR), and output maximum burst cell size for an ATM permanent virtual circuit (PVC), PVC range, switched virtual circuit (SVC), VC class, or VC bundle member, use the **vbr-nrt** command in the appropriate command mode. To remove the VBR-NRT parameters, use the **no** form of this command.

vbr-nrt *output-pcr* *output-scr* *output-maxburstsize* [*input-pcr*] [*input-scr*] [*input-maxburstsize*]
no **vbr-nrt** *output-pcr* *output-scr* *output-maxburstsize* [*input-pcr*] [*input-scr*] [*input-maxburstsize*]

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vbr-nrt *output-pcr* *output-scr* *output-maxburstsize*
no **vbr-nrt** *output-pcr* *output-scr* *output-maxburstsize*

Syntax Description

output-pcr	The output PCR, in kilobytes per second (kbps).
output-scr	The output SCR, in kbps.
output-maxburstsize	The output maximum burst cell size, expressed in number of cells.
input-pcr	(Optional for SVCs only) The input PCR, in kbps.
input-scr	(Optional for SVCs only) The input SCR, in kbps.
input-maxburstsize	(Optional for SVCs only) The input maximum burst cell size, expressed in number of cells.

Command Default

Unspecified bit rate (UBR) QoS at the maximum line rate of the physical interface is the default.

Command Modes

ATM PVC-in-range configuration (for an individual PVC within a PVC range)
ATM PVC range configuration (for an ATM PVC range)
ATM PVP configuration
Bundle-vc configuration (for ATM VC bundle members)
Interface-ATM-VC configuration (for an ATM PVC or SVC)
VC-class configuration (for a VC class)

Command History

Release	Modification
11.3T	This command was introduced.
12.0(3)T	This command was enhanced to support configuration of VBR-NRT QoS and specification of output PCR, output SCR, and output maximum burst cell size for ATM bundles and VC bundle members.
12.0(25)SX	This command was integrated into Cisco IOS Release 12.0(25)SX and implemented on the Cisco 10000 series router.

Release	Modification
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.3	This command was made available in ATM PVP configuration mode.

Usage Guidelines
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 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.

To use this command in VC-class configuration mode, enter the **vc-class atm** global configuration command before you enter the **vbr-nrt** command. This command has no effect if the VC class that contains the command is attached to a standalone VC, that is, if the VC is not a bundle member.

To use this command in bundle-vc configuration mode, enter the **pvc-bundle**configuration command and add the VC as a bundle member.

VCs in a VC bundle are subject to the following configuration inheritance rules (listed in order of precedence):

- VC configuration in bundle-vc mode

- Bundle configuration in bundle mode (with the effect of assigned VC-class configuration)

- Subinterface configuration in subinterface mode

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Input PCR, input SCR, and input maximum burst size (MBS) are not supported.

For Cisco IOS Release 12.2(31)SB2 and later releases, if you set the output PCR and SCR to the same value, the Cisco IOS software allows a maximum burst cell size of 1. For example:

```
interface ATM2/0/0.81801 point-to-point
 bandwidth 11760
 pvc 81/801
```

```
      vbr-nrt 11760 11760 32
      encapsulation aal5snap
      protocol pppoe


interface ATM2/0/0.81801 point-to-point
 bandwidth 11760
 pvc 81/801
   vbr-nrt 11760 11760 1
   encapsulation aal5snap
   protocol pppoe
```

Examples

The following example specifies the output PCR for an ATM PVC 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 atm-svc1 nsap 47.0091.81.000000.0040.0B0A.2501.ABC1.3333.3333.05
 vbr-nrt 10000 5000 32 20000 10000 64
```

Related Commands

Command	Description
abr	Selects ABR QoS and configures output peak cell rate and output minimum guaranteed cell rate for an ATM PVC or virtual circuit class.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
bump	Configures the bumping rules for a virtual circuit class that can be assigned to a virtual circuit bundle.
bundle	Creates a bundle or modifies an existing bundle to enter bundle configuration mode.
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 retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
precedence	Configures precedence levels for a virtual circuit class that can be assigned to a virtual circuit bundle and thus applied to all virtual circuit members of that bundle.
protect	Configures a virtual circuit class with protected group or protected virtual circuit status for application to a virtual circuit bundle member.

Command	Description
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle, and 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-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.
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.
vc-class atm	Creates a VC class for an ATM PVC, SVC, or ATM interface, and enters vc-class configuration mode.

vbr-rt

To configure the real-time variable bit rate (VBR) for VoATM voice connections, use the **vbr-rt** command in the appropriate configuration mode. To disable VBR for voice connections, use the **no** form of this command.

vbr-rt *peak-rate average-rate burst*
no vbr-rt

Syntax Description

peak-rate	Peak information rate (PIR) for the voice connection, in kilobytes per second (kbps). If it does not exceed your carrier's line rate, set it to the line rate. Range is from 56 to 10000.
average-rate	Average information rate (AIR) for the voice connection, in kbps.
burst	Burst size, in number of cells. Range is from 0 to 65536.

Command Default

No real-time VBR settings are configured

Command Modes

ATM Bundle-vc configuration for ATM VC bundle members
ATM PVP configuration for an ATM PVP
Interface-ATM-VC configuration for an ATM permanent virtual connection (PVC) or switched virtual circuit (SVC)
VC-class configuration for a virtual circuit (VC) class

Command History

Release	Modification
12.0	This command was introduced on the Cisco MC3810.
12.1(5)XM	This command was implemented on Cisco 3600 series routers and modified to support Simple Gateway Control Protocol (SGCP) and Media Gateway Control Protocol (MGCP).
12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.
12.2(11)T	This command was implemented on the Cisco AS5300 and Cisco AS5850.
Cisco IOS XE Release 2.3	This command was made available in ATM PVP configuration mode.

Usage Guidelines

This command configures traffic shaping between voice and data PVCs. Traffic shaping is required so that the carrier does not discard calls. To configure voice and data traffic shaping, you must configure the peak, average, and burst options for voice traffic. Configure the burst value if the PVC will carry bursty traffic. Peak, average, and burst values are needed so that the PVC can effectively handle the bandwidth for the number of voice calls.

Calculate the minimum peak, average, and burst values for the number of voice calls as follows:

Peak Value

Peak value = (2 x the maximum number of calls) x 16K = _____

Average Value

Calculate according to the maximum number of calls that the PVC will carry times the bandwidth per call. The following formulas give you the average rate in kbps:

- For VoIP:

    - G.711 with 40- or 80-byte sample size:

Average value = max calls x 128K = _____

- • G.726 with 40-byte sample size:

Average value = max calls x 85K = _____

- • G.729a with 10-byte sample size:

Average value = max calls x 85K = _____

- For VoATM adaptation layer 2 (VoAAL2):

    - G.711 with 40-byte sample size:

Average value = max calls x 85K = _____

- • G.726 with 40-byte sample size:

Average value = max calls x 43K = _____

- • G.729a with 10-byte sample size:

Average value = max calls x 43K = _____

If voice activity detection (VAD) is enabled, bandwidth usage is reduced by as much as 12 percent with the maximum number of calls in progress. With fewer calls in progress, bandwidth savings are less.

Burst Value

Set the burst size as large as possible, and never less than the minimum burst size. Guidelines are as follows:

- Minimum burst size = 4 x number of voice calls = _____

- Maximum burst size = maximum allowed by the carrier = _____

When you configure data PVCs that will be traffic shaped with voice PVCs, use AAL5snap encapsulation and calculate the overhead as 1.13 times the voice rate.

Examples

The following example configures the traffic-shaping rate for ATM PVC 20. Peak, average, and burst rates are calculated based on a maximum of 20 calls on the PVC.

```
pvc 20
 encapsulation aal5mux voice
 vbr-rt 640 320 80
```

Related Commands

Command	Description
encapsulation aal5	Configures the AAL and encapsulation type for an ATM PVC, SVC, or VC class.

vc-class atm

To create a virtual circuit (VC) class for an ATM permanent virtual circuit (PVC), switched virtual circuit (SVC), or ATM interface and enter vc-class configuration mode, use the **vc-class atm**global configuration command. To remove a VC class, use the **no** form of this command.

vc-class atm *name*
no vc-class atm *name*

Syntax Description

name	Name of your VC class.

Command Default No VC class is defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
11.3 T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.5	This command was implemented on Cisco ASR 1000 series routers.

Usage Guidelines 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.

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

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