scrambling cell-payload through show lane

scrambling cell-payload

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

scrambling cell-payload

no scrambling cell-payload

Syntax Description

This command has no arguments or keywords.

Command Default

Scrambling is disabled.

Command Modes

Interface configuration

Command History

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

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

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

Examples

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

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

Related Commands

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

scrambling-payload

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

scrambling-payload

no scrambling-payload

Syntax Description

This command has no arguments or keywords.

Command Default

Payload scrambling is on for E1 links and off for T1 links.

Command Modes

Interface configuration

Command History

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

Normally, you do not issue the scrambling-payload command explicitly, because the default value is sufficient. On T1 links, the default b8zs line encoding normally assures sufficient reliability.

The scrambling setting must match that of the far end.

Examples

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

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

Related Commands

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

selection-method

To specify the method for selection of permanent virtual circuit (PVC) bundle members, use the **selection-method** command in ATM bundle configuration mode. To disable a selection method, use the **no** form of this command.

selection-method {**qos-group**| **tos-exp**}

no selection-method {**qos-group**| **tos-exp**}

Syntax Description

qos-group	Specifies that the quality of service (QoS) group value associated with each packet for selection of PVC bundle members is used.
tos-exp	Specifies that the type of service (ToS) bit settings of each packet (for IP packets) or Experimental (EXP) bit settings of each packet (for Multiprotocol Label Switching (MPLS) packets) for selection of PVC bundle members is used.

Command Default

No selection method is set.

Command Modes

ATM bundle configuration (config-if-atm-bundle)

Command History

Release	Modification
12.4(4)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

Usage Guidelines

You can change the selection method from QoS groups to ToS or EXP only if none of the PVC bundle members have QoS groups or Inverse Address Resolution Protocol (Inverse ARP) configured.

You can change the selection method from ToS or EXP to QoS groups only if none of the PVC bundle members have precedence, protection, or bumping configured.

Examples

The following example shows how to use the QoS groups selection method on a PVC bundle and associate a QoS group with a member of the PVC bundle:

```
Router> enable
Password:
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface atm 2/0
Router(config-subif)# bundle test
Router(config-if-atm-bundle)# selection-method qos-group
Router(config-if-atm-bundle)# pvc 1/32
Router(config-if-atm-member)# qos-group 1
Router(config-if-atm-member)# end
```

The following example shows the ToS or EXP selection method for a PVC bundle:

```
Router> enable
Password:
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface atm 2/0
Router(config-subif)# bundle test
Router(config-if-atm-bundle)# selection-method tos-exp
Router(config-if-atm-member)# end
```

Related Commands

Command	Description
inarp-vc	Enables InARP for a PVC bundle member.
qos-group (ATM bundle member)	Associates a QoS group or groups with a PVC bundle member.

shortcut-frame-count

To specify the maximum number of times a packet can be routed to the default router within shortcut-frame time before a Multiprotocol over ATM (MPOA) resolution request is sent, use the **shortcut-frame-count** command in MPC configuration mode. To restore the default shortcut-setup frame count value, use the **no** form of this command.

shortcut-frame-count *count*

no shortcut-frame-count

Syntax Description

count	Shortcut-setup frame count. The default is 10 frames.

Command Default

The default is 10 frames.

Command Modes

MPC configuration

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.

Examples

The following example shows how to set the shortcut-setup frame count to 5 for the MPC:

```
Router(mpoa-client-config)# shortcut-frame-count 5
```

Related Commands

Command	Description
atm-address	Overrides the control ATM address of an MPC or MPS.
mpoa client config name	Defines an MPC with a specified name.
shortcut-frame-time	Sets the shortcut-setup frame time (in seconds) for the MPC.

shortcut-frame-time

To set the shortcut-setup frame time (in seconds) for the Multiprotocol over ATM (MPOA) client (MPC), use the **shortcut-frame-time** command in MPC configuration mode. To restore the default shortcut-setup frame-time value, use the **no** form of this command.

shortcut-frame-time *time*

no shortcut-frame-time

Syntax Description

time	Shortcut-setup frame time (in seconds).

Command Default

The default is 1 second.

Command Modes

MPC configuration

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.

Examples

The following example shows how to set the shortcut-setup frame time to 7 for the MPC:

```
Router(mpoa-client-config)# shortcut-frame-time 7
```

Related Commands

Command	Description
atm-address	Overrides the control ATM address of an MPC or MPS.
mpoa client config name	Defines an MPC with a specified name.
shortcut-frame-count	Specifies the maximum number of times a packet can be routed to the default router within shortcut-frame time before an MPOA resolution request is sent.

show aal2 xgcpspi

To display the ATM adaptation layer 2 (AAL2) External Media Gateway Control Protocols (XGCP) Service Provider Interface, use the **show aal2 xgcpspi** command in privileged EXEC mode.

show aal2 xgcpspi {**call**| **statistics**}

Syntax Description

call	Displays the active call details of the AAL2 XGCP Service Provider Interface.
statistics	Displays the call statistics of the AAL2 XGCP Service Provider Interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(15)T	This command was introduced.

Usage Guidelines

Use this command to display the active call details and call statistics of the AAL2 XGCP Service Provider Interface.

Examples

The following is sample output from the **show aal2 xgcpspi**command. The fields are self-explanatory.

```
Router# show aal2 xgcpspi call
C a l l I d
       No. Srce  Dest  Mode      VPI VCI Port
       === ===== ===== ========= === === ====
       1   4     3     Receive   2   40  0
       2   6     5     Receive   2   41  8
```

Related Commands

Command	Description
show aal2 profile	Displays AAL2 profiles configured on the system.

show atm arp-server

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

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

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

Cisco 7500 series with ATM and enhanced ATM port adapters

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

Cisco 4500 and 4700 series with NPM

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

Syntax Description

atm *slot* / *port*	(Optional) ATM slot and port numbers. Use this format for the following platform configurations: • AIP on Cisco 7500 series routers. • ATM port adapter, ATM-CES port adapter, and enhanced ATM port adapter on Cisco 7200 series routers. • 1-port ATM-25 network module on Cisco 2600 and 3600 series routers.
atm *slot* / *port-adapter* / *port*	(Optional) ATM slot, port adapter, and port numbers. Use this format for the ATM port adapter or enhanced ATM port adapter on Cisco 7500 series routers.
atm *number*	(Optional) ATM network processor module (NPM) number on Cisco 4500 and 4700 routers.
. *subinterface-number*	(Optional) Subinterface number.

Command Modes

User EXEC

Command History

Release	Modification
11.1	This command was introduced.
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 atm arp-server command when no interface is specified:

```
Router# show atm arp-server
Note that a '*' next to an IP address indicates an active call
      IP Address        TTL     ATM Address
ATM1/0:
    * 4.4.4.2           19:50   ac153366020000000000000000000000000000000
    * 4.4.4.6           19:50   ac153366060000000000000000000000000000000
    * 4.4.4.15          19:14   ac153366150000000000000000000000000000000
ATM1/0.23:
    * 10.0.0.2          19:50   ac153366020000000000000000000000000000023
    * 10.0.0.6          19:50   ac153366060000000000000000000000000000023
```

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

```
Router# show atm arp-server atm 1/0
Note that a '*' next to an IP address indicates an active call
      IP Address        TTL     ATM Address
    * 4.4.4.2           19:00   ac153366020000000000000000000000000000000
    * 4.4.4.6           19:00   ac153366060000000000000000000000000000000
    * 4.4.4.15          19:14   ac153366150000000000000000000000000000000
```

Related Commands

Command	Description
atm arp-server	Identifies an ATM ARP server for the IP network or sets TTL values for entries in the ATM ARP table.

show atm class-links

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

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

Syntax Description

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

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3	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 atm class-links** command for VPI 0 and VCI 66:

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

show atm cell-packing

To display the average number of cells in packets sent from an ATM permanent virtual circuit (PVC) to a single Multiprotocol Label Switching (MPLS) pseudowire and the average number of cells in packets that are received from an MPLS pseudowire and sent to the respective ATM virtual circuits (VCs), use the **show atm cell-packing** command in privileged EXEC mode.

show atm cell-packing

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.7S	This command was introduced.

Usage Guidelines

To map one or more ATM PVCs to a single pseudowire, an N:1 PVC must be created on an ATM interface. The output of the **show atm cell-packing** command can be used to gauge the amount of cell packing in packets that originate from a device and are received by the device, for a specific pseudowire. Cisco IOS software calculates the average number of cells per packet in each direction.

Examples

The following is sample output from the **show atm cell-packing** command. The fields in the output are self-explanatory.

```
Device# show atm cell-packing

                                   average                           average
       circuit              local  nbr of cells     peer     nbr of cells       MCPT
       type                 MNCP   rcvd in one pkt  MNCP     sent in one pkt    us)

       ATM4/0/0.1  vc   1/41    20             1     20         1                 100
       ATM4/0/0.1  vc   1/42    20             1     20         1                 100
```

Related Commands

Command	Description
cell-packing	Enables multiple cell packing.

show atm ilmi-configuration

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

show atm ilmi-configuration

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0	This command was introduced prior to Cisco IOS Release 12.0.
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 shows sample output for the **show atm ilmi-configuration** command:

```
Router# show atm ilmi-configuration
LECS Address(s):
11223344556677889900112233445566778899 00
```

The table below describes the fields shown in the display.

Table 1: show atm ilmi-configuration Field Descriptions

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

Related Commands

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

show atm ilmi-status

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

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

Syntax Description

atm	(Optional) ATM interface.
interface-number	(Optional) Number of the ATM interface.

Command Modes

Privileged EXEC

Command History

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

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

Examples

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

```
Router# show atm ilmi-status

Interface :ATM2/0 Interface Type :Unknown
ILMI VCC :(0, 16) ILMI Keepalive :Disabled
ILMI State:      Restarting
Interface :ATM5/0 Interface Type :Private UNI (User-side)
ILMI VCC :(0, 16) ILMI Keepalive :Disabled
ILMI State:      UpAndNormal
Peer IP Addr:    10.0.52.17      Peer IF Name:    ATM1/1/0
Peer MaxVPIbits: 8               Peer MaxVCIbits: 14
Active Prefix(s) :
47.0091.8100.0000.0040.0b0a.2501
End-System Registered Address(s) :
47.0091.8100.0000.0040.0b0a.2501.bbbb.ccdd.eeff.12(Confirmed)
```

The table below describes the fields shown in the display.

Table 2: show atm ilmi-status Field Descriptions

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

Related Commands

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

show atm interface atm

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

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

show atm interface atm *slot*/*port*

Cisco 7500 series with ATM and enhanced ATM port adapters

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

Cisco 4500 and 4700 series with NPM

show atm interface atm *number*

Syntax Description

slot / *port*	ATM slot number and port number. Use this format on the following platform configurations: • The AIP on Cisco 7500 series routers. • The ATM port adapter, ATM-CES port adapter, or enhanced ATM port adapter on Cisco 7200 series routers. • The 1-port ATM-25 network module on Cisco 2600 and 3600 series routers.
slot / *port-adapter* / *port*	ATM slot, port adapter, and port number. Use this format on the ATM port adapter or ATM-CES port adapter on Cisco 7500 series routers.
number	NPM number for Cisco 4500 and 4700 routers.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.0	The *number*argument was added.
11.2	The *slot* / *port-adapter* / *port* arguments 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 for the ATM-CES port adapter to display statistics on slot 4, port 0:

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

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

```
Router# show atm interface atm 6/0
ATM interface ATM6/0
AAL enabled:  AAL5, Maximum VCs: 2048, Current VCs: 3
Maximum Transmit Channels: 64
Tx buffers: 256, Rx buffers 256, Exception Queue: 32, Raw Queue: 32
VP Filter: 0x7B, VCIs per VPI: 1024, Max Datagram Size: 4496
PLIM Type: SONET - 155Mbps, TX clocking: INTERNAL
0 input, 59 output, 0 IN fast, 0 OUT fast
ABR parameters, rif: 16 rdf: 16
Config. is ACTIVE
```

The table below describes the fields shown in the display.

Table 3: show atm interface atm Field Descriptions

Field	Description
ATM interface	Slot and port number of the interface.
AAL enabled	Type of AAL . If both AAL5 and AAL3/4 are enabled on the interface, the output will include both AAL5 and AAL3/4.
Maximum VCs	Maximum number of virtual circuits this interface can support.
Current VCs	Number of active virtual circuits.
Tx buffers, Rx buffers	Number of transmit and receive buffers.
Exception Queue	Number of exception buffers.
Raw Queue	Queue size.
VP Filter	Hexadecimal value of the VP filter.

Field	Description
VCIs per VPI	Maximum number of VCIs to support per VPI.
Max Datagram Size	The configured maximum number of bytes in the largest datagram.
MIDs/VC	The configured maximum number of message identifiers allowed per virtual circuit on this interface.
PLIM Type	Physical Layer Interface Module (PLIM) type (E3, 4B/5B, or SONET).
Framing	For E3, this might be G.804; otherwise, no framing.
TX clocking	Clocking on the router. For E3 or SONET, this might be INTERNAL, meaning that the AIP or NPM generates the clock. Otherwise, LINE indicates that the ATM switch provides the clocking.
input	Number of packets received and process-switched.
output	Number of packets sent from process switch.
IN fast	Number of input packets fast-switched.
OUT fast	Number of output packets fast-switched.
ABR parameters, rif rdf	The amount that the cell transmission rate increases or decreases in response to flow control information from the network or destination for available bit rate (ABR) PVCs. The rate increase factor (RIF) and rate decrease factor (RDF) in this example are 16, the default.
Rate-Queue	List of configured rate queues.
reg=	Actual register value passed to the AIP to define a specific rate queue (AIP only).
DYNAMIC	Indicates that the rate queue is dynamic and was created automatically by the software. Dynamic rate queues are created when an **atm pvc**command specifies a peak or average rate that does not match any user configured rate queue. The value PERMANENT indicates that the rate queue was user-configured.
VCCs	Number of virtual channel connections (VCCs) dynamically attached to this rate queue.

Field	Description
ATM4/0.1	Indicates that the subinterface supports ATM adaptation layer AAL3/4 and displays the SMDS E.164 unicast address and the SMDS E.164 multicast address assigned to the subinterface.
Config. is	ACTIVE or VALID in *n* SECONDS. ACTIVE indicates that the current AIP or NPM configuration has been loaded into the AIP and is being used. There is a 5-second window when a user changes a configuration and the configuration is sent to the AIP.

Related Commands

Command	Description
pvc	Configures the PVC interface.

show atm map

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

show atm map

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.1CA	This command was modified to include an example for the ATM-CES port adapter (PA).
12.0(3)T	This command was modified to include display for ATM bundle maps. An ATM bundle map identifies a bundle and all of its related virtual circuits (VCs).
12.2(2)T	The display output for this command was modified to include the IPv6 address mappings of remote nodes to ATM permanent virtual circuits (PVCs).
12.0(21)ST	This command was integrated into Cisco IOS Release 12.0(21)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
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.

Examples

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

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

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

```
Router# show atm map
Map list alien: PERMANENT
ip 10.1.1.1 maps to VC 6
ip 10.1.1.2 maps to VC 6
```

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

```
Router# show atm map
Map list atm:
vines 3004B310:0001 maps to VC 4, broadcast
ip 172.21.168.110 maps to VC 1, broadcast
clns 47.0004.0001.0000.0c00.6e26.00 maps to VC 6, broadcast
appletalk 10.1 maps to VC 7, broadcast
decnet 10.1 maps to VC 2, broadcast
Map list new-york: PERMANENT
ip 10.0.0.2 maps to bundle new-york, 0/200, 0/205, 0/210, ATM1/0.1
```

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

```
Router# show atm map
Map list atm_pri: PERMANENT
ip 10.4.4.4 maps to NSAP CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12, broadcast,
aal5mux, multipoint connection up, VC 6
ip 10.4.4.6 maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12, broadcast,
aal5mux, connection up, VC 15, multipoint connection up, VC 6
Map list atm_ipx: PERMANENT
ipx 1004.dddd.dddd.dddd maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12,
broadcast, aal5mux, multipoint connection up, VC 8
ipx 1004.cccc.cccc.cccc maps to NSAP CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12,
broadcast, aal5mux, multipoint connection up, VC 8
Map list atm_apple: PERMANENT
appletalk 62000.5 maps to NSAP CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12, broadcast,
 aal5mux, multipoint connection up, VC 4
appletalk 62000.6 maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12, broadcast,
 aal5mux, multipoint connection up, VC 4
```

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

```
Router# show atm map
Map list endA: PERMANENT
ip 10.11.11.1 maps to VC 4, VPI 0, VCI 60, ATM0.2
```

The following sample output from the show atm map command shows the link-local and global IPv6 addresses (FE80::60:3E47:AC8:C and 2001:0DB8:2222::72, respectively) of a remote node that are explicitly mapped to PVC 1/32 of ATM interface 0;

```
Router# show atm map
Map list ATM0pvc1 : PERMANENT
ipv6 FE80::60:3E47:AC8:C maps to VC 1, VPI 1, VCI 32, ATM0
        , broadcast
ipv6 2001:0DB8:2222::72 maps to VC 1, VPI 1, VCI 32, ATM0
```

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

Table 4: show atm map Field Descriptions

Field	Description
Map list	Name of map list.

Field	Description
PERMANENT	This map entry was entered from configuration; it was not entered automatically by a process.
ip 172.21.168.110 maps to VC 1 or ip 10.4.4.6 maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12	Name of protocol, the protocol address, and the virtual circuit descriptor (VCD) or network service access point (NSAP) to which the address is mapped (for ATM VCs configured with the **atm pvc** command).
broadcast	Indicates pseudobroadcasting.
ip 10.11.11.1 maps to VC 4, VPI 0, VCI 60, ATM0.2 or ip 10.4.4.6 maps to NSAP DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12	Name of protocol, the protocol address, the virtual path identifier (VPI) number, the virtual channel identifier (VCI) number, and the ATM interface or subinterface (for ATM PVCs configured using the **pvc** command). or Name of the protocol, the protocol address, and the NSAP to which the address is mapped (for ATM switched virtual circuits (SVCs) configured using the **svc** command).
aal5mux	Indicates the encapsulation used, a multipoint or point-to-point VC, and the number of the virtual circuit.
multipoint connection up	Indicates that this is a multipoint VC.
VC 6	Number of the VC.
connection up	Indicates a point-to-point VC.
VPI	VPI for the VC.
VCI	VCI for the VC.
ATM1/0.52	ATM interface or subinterface number.
Map list	Name of the bundle whose mapping information follows.
ip 10.1.1.1 maps to bundle san-jose, 0/122, 0/123, 0/124, 0/126	IP address of the bundle and VC members that belong to the bundle.

Related Commands

Command	Description
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).
protocol ipv6 (ATM)	Maps the IPv6 address of a remote node to the ATM PVC used to reach the address.
pvc	Creates or assigns a name to an ATM PVC, specifies the encapsulation type on an ATM PVC, or enters interface-ATM-VC configuration mode.
show atm bundle	Displays the bundle attributes assigned to each bundle VC member and the current working status of the VC members.
show atm bundle statistics	Displays statistics on the specified bundle.
svc	Creates an ATM SVC and specifies destination NSAP address on an interface or subinterface.

show atm pvc

To display all ATM permanent virtual connections (PVCs) and traffic information, use the **showatmpvc**command in privileged EXEC mode.

show atm pvc [**interface atm** *interface-number* [. *subinterface*] *vpi*/*vci* **vaccess** [*detail*]]

Syntax Description

vpi / *vci*	(Optional) ATM virtual path identifier (VPI) and virtual channel identifier (VCI) numbers. The absence of the slash character **(/)** and a *vpi* value causes the *vpi* value to default to 0.
interface atm *interface-number*	(Optional) Displays all PVCs on the specified ATM interface. To determine the appropriate form of the *interface-number* argument, consult your ATM network module, port adapter, or router documentation.
. *subinterface-number*	(Optional) Subinterface number in the range from 1 to 4294967293. The dot (.) is required as a separator between *interface-number*and *subinterface-number.*
vpi / *vci*	(Optional) Displays the names of all of the virtual access interfaces associated with the PVC *vpi*/*vci* on the ATM subinterface you specify.
vaccess *detail*	Displays information about the virtual access interfaces associated with the PVC *vpi*/*vci* on the ATM subinterface you specify.

Command Default

All ATM PVCs are displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3T	This command was introduced.
12.1(1)T	This command was modified to display PPP over Ethernet (PPPoE) status.

Release	Modification
12.2(4)T	This command was modified to display only PVCs that are attached to a virtual access interface. Before this modification, all PVCs that were configured with PPP over ATM (PPPoA) or PPPoE were displayed.
12.0(23)S	This command was modified to display OAM cell emulation status for Any Transport over MPLS (AToM).
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.3(7)T	This command was modified to display information about multilink PPP over ATM link fragmentation and interleaving for ATM PVCs.
12.0(30)S	This command was modified to display information about OAM loopback detection.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
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(31)SB10	This command was modified to display information about OAM loopback detection.
Cisco IOS XE Release 2.3	This command was implemented on Cisco ASR 1000 series routers.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

Usage Guidelines

If you do not specify the *vpi*/*vci* or *name* argument, the output of this command is the same as that of the **showatmvc**comm and, but only the configured PVCs appear.

If you specify the *vpi*/*vci* or *name* argument, the output of this command is the same as that of the **showatmvc***vcd* command, with extra information related to PVC management, including connection name, detailed states, and Operation, Administration, and Maintenance (OAM) counters. Do not attempt to configure virtual circuit numbers 3 and 4 as these virtual circuits are reserved for OAM.

If you include the **interfaceatm***interface-number*argument in the command, the output of this command displays all of the PVCs under that interface or subinterface. If you include the *vpi*/*vci***vaccess** argument, the command output displays the names of all of the virtual access interfaces associated with the PVC on the ATM interface. If you include the *vpi*/*vci***vaccessdetail** argument, the command output displays detailed virtual access interface information.

The functionality and output of the show atm pvc {**interfaceatm***interface-numbervpi*/*vci*} command are unchanged.

Examples

The following is sample output from the**showatmpvc** command. The output is the same as that of the **showatmvc**comm and, but only the configured PVCs appear.

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

The following is sample output from the **showatmpvc** command with the *vpi*/*vci* argument specified:

```
Router# show atm pvc 0/41
ATM2/0: VCD: 3, VPI: 0, VCI: 41
UBR, PeakRate: 155000
AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x0
OAM frequency: 0 second(s), OAM retry frequency: 1 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
OAM Loop detection: Disabled
ILMI VC state: Not Managed
InARP frequency: 15 minutes(s)
InPkts: 31759, OutPkts: 26497, InBytes: 2356434, OutBytes: 1589743
InPRoc: 15785, OutPRoc: 26472, Broadcasts: 0
InFast: 20, OutFast: 20, InAS: 15954, OutAS: 6
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI: 0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0, F5 OutRDI: 0
F4 OutEndloop: 0, F4 OutSegloop: 0, F4 OutRDI: 0
OAM cell drops: 0
Status: UP
PPPOE enabled.
```

The following sample output from the **showatmpvc** command displays OAM cell emulation statistics, which are marked in this example by exclamation points:

```
Router# show atm pvc 5/500
ATM4/1/0.200: VCD: 6, VPI: 5, VCI: 500
UBR, PeakRate: 1
AAL5-LLC/SNAP, etype:0x0, Flags: 0x34000C20, VCmode: 0x0
OAM Cell Emulation: enabled, F5 End2end AIS Xmit frequency: 1 second(s) !!!
OAM frequency: 0 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not ManagedVerified
OAM Loop detection: Disabled
ILMI VC state: Not Managed
InPkts: 564, OutPkts: 560, InBytes: 19792, OutBytes: 19680
InPRoc: 0, OutPRoc: 0
InFast: 4, OutFast: 0, InAS: 560, OutAS: 560
InPktDrops: 0, OutPktDrops: 0
CrcErrors: 0, SarTimeOuts: 0, OverSizedSDUs: 0
Out CLP=1 Pkts: 0
OAM cells received: 26
F5 InEndloop: 0, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 26
OAM cells sent: 77
F5 OutEndloop: 0, F5 OutSegloop: 0, F5 OutAIS: 77, F5 OutRDI: 0  !!!
OAM cell drops: 0
Status: UP
```

The following is sample output from the **showatmpvc** command with the ATM subinterface specified:

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

The following is sample output for the **showatmpvc** command for a PVC that is a member of a multilink PPP bundle:

```
Router# show atm pvc 15/200
ATM4/0.10000:VCD:16, VPI:15, VCI:200
UBR, PeakRate:149760 (353208 cps)
AAL5-LLC/SNAP, etype:0x0, Flags:0xC20, VCmode:0x0, Encapsize:12
OAM frequency:0 second(s), OAM retry frequency:1 second(s)
OAM up retry count:3, OAM down retry count:5
OAM Loopback status:OAM Disabled
OAM VC State:Not Managed
OAM Loop detection: Disabled
ILMI VC status:Not Managed
VC TxRingLimit:40 particles
VC Rx Limit:800 particles
InARP frequency:15 minutes(s)
Transmit priority 6
InPkts:347, OutPkts:399, InBytes:6268, OutBytes:7728
InCells:347, OutCells:399
InPRoc:7, OutPRoc:228
InFast:338, OutFast:169, InAS:0, OutAS:0
InPktDrops:0, OutPktDrops:0/0/0 (holdq/outputq/total)
InCellDrops:0, OutCellDrops:0
InByteDrops:0, OutByteDrops:0
CrcErrors:0, SarTimeOuts:0, OverSizedSDUs:0, LengthViolation:0, CPIErrors:0
Out CLP=1 Pkts:0, Cells:0
OAM cells received:0
F5 InEndloop:0, F5 InSegloop:0, F5 InAIS:0, F5 InRDI:0
F4 InEndloop:0, F4 InSegloop:0, F4 InAIS:0, F4 InRDI:0
OAM cells sent:0
F5 OutEndloop:0, F5 OutSegloop:0, F5 OutRDI:0
F4 OutEndloop:0, F4 OutSegloop:0, F4 OutRDI:0
OAM cell drops:0
Status:UP
PPP:Virtual-Access3 from Virtual-Template1
PPPoA Current State = LOCALLY_TERMINATED
PPPoA Latest  Event = Vaccess Up
PPPoA Latest  Error = None
PPPoA Session ID    = 7
PPPoA  Handle = 0x4D000006, SSS Handle = 0x00000000
Switch Handle = 0xB5000006, PPP Handle = 0xD700000A
AAA Unique ID = 0x00000007, AIE Handle = 0xE7000006
PVC belongs to Multilink PPP Bundle Virtual-Access4 as a PPPoA member link
Packets in VC Holdq:0 , Particles in VC Tx Ring:0
```

The following is sample output from the **showatmpvc**command with loopback detection mode through OAM enabled:

```
Router# show atm pvc 4/100
ATM1/0: VCD: 4, VPI: 4, VCI: 100
UBR, PeakRate: 149760
AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x0
!
OAM frequency: 10 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Received
OAM VC state: Verified
OAM Loop detection: Enabled ! Indicates that loopback mode detection is enabled.
!
ILMI VC state: Not Managed
VC is managed by OAM.
InARP frequency: 15 minutes(s)
```

```
Transmit priority 4
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
InPktDrops: 0, OutPktDrops: 0
CrcErrors: 0, SarTimeOuts: 0, OverSizedSDUs: 0
Out CLP=1 Pkts: 0
OAM cells received: 27
F5 InEndloop: 27, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
OAM cells sent: 27
F5 OutEndloop: 27, F5 OutSegloop: 0, F5 OutAIS: 0, F5 OutRDI: 0
OAM cell drops: 3
Status: UP
```

The following is sample output from the **showatmpvc** command when loopback mode is detected:

```
Router# show atm pvc 4/100
ATM1/0: VCD: 4, VPI: 4, VCI: 100
UBR, PeakRate: 149760
AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x0
!
OAM frequency: 10 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Sent
OAM VC state: Not Verified
OAM Loop detection: Enabled, Detected ! Indicates that loopback mode has been detected on
this interface.
!
ILMI VC state: Not Managed
VC is managed by OAM.
InARP frequency: 15 minutes(s)
Transmit priority 4
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
InPktDrops: 0, OutPktDrops: 0
CrcErrors: 0, SarTimeOuts: 0, OverSizedSDUs: 0
Out CLP=1 Pkts: 0
OAM cells received: 20
F5 InEndloop: 20, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
OAM cells sent: 20
F5 OutEndloop: 20, F5 OutSegloop: 0, F5 OutAIS: 0, F5 OutRDI: 0
OAM cell drops: 1
Status: DOWN, State: NOT_VERIFIED
```

Examples

The following example shows sample output from the **showatmpvcinterfaceatm***interface-numbervpi/vci***vaccess** command. In the output, the *vpi/vci***vaccess** option causes the name of all of the virtual access interfaces (VAIs) to appear. These VAIs are associated with PVC 100/1000 on ATM subinterface ATM 3/0/0.6.

```
Router# show atm pvc interface atm3/0/0.6 100/1000 vaccess
   VCD /  Protocol Virtual Access
Interface  Name VPI VCI Type Interface
ATM3/0/0.6 3 100 1000 pppoe Vi3.1
```

The following example shows sample output when using the **showatmpvcinterfaceatm***interface-numbervpi/vci***vaccessdetail** command. The output is similar to the output that appears when you use the **showinterface***virtual-access-number* command.

```
Router# show atm pvc interface atm3/0/0.6 100/1000 vaccess detail

ATM3/0/0.6: VCD: 3 VPI: 100 VCI: 1000
Virtual-Access3.1 is up, line protocol is up
Hardware is Virtual Access interface
Internet address will be negotiated using IPCP
MTU 1492 bytes, BW 599040 Kbit, DLY 100000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, LCP Open
Stopped: IPCP
```

```
PPPoE vaccess, cloned from Virtual-Template1
Vaccess status 0x0
PPPoE Bound to ATM3/0/0.6 VCD: 3, VPI: 100, VCI: 1000
Keepalive set (10 sec)
3 packets input, 50 bytes
3 packets output, 44 bytes
Last clearing of "show interface" counters never
```

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

Table 5: show atm pvc Field Descriptions

Field	Description
Interface	Interface and subinterface slot and port.
VCD/Name	Virtual connection descriptor (virtual connection number). The connection name is displayed if a name for the VC was configured using the **pvc** command.
VPI	Virtual path identifier.
VCI	Virtual channel identifier.
Type	Type of PVC detected from PVC discovery; either PVC-D, PVC-L, or PVC-M: • 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 QoS[1] 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 or PeakRate	Kilobits per second sent at the peak rate.
Avg/Min or Average Rate	Kilobits per second sent at the average rate.
Burst Cells	Maximum number of ATM cells that the VC can send at peak rate.

Field	Description
Sts or Status	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 later in this table. • INACTIVE--The interface is down.
Connection Name	Name of the PVC.
UBR, UBR+, or VBR-NRT	• UBR--Unspecified bit rate QoS is specified for this PVC. See the **ubr** command for further information. • UBR+--Unspecified bit rate QoS is specified for this PVC. See the **ubr+** command for further information. • VBR-NRT--Variable bit rate-non-real-time QoS rates are specified for this PVC. See the **vbr-nrt** command for further information.
etype	Encapsulation type.
Flags	Bit mask describing VC information. The flag values are summed to result in the displayed value: • 0x40--SVC • 0x20--PVC • 0x10--ACTIVE • 0x0--AAL5-SNAP • 0x1--AAL5-NLPID • 0x2--AAL5-FRNLPID • 0x3--AAL5-MUX • 0x4--AAL3/4-SMDS • 0x5--QSAAL • 0x6--ILMI • 0x7--AAL5-LANE • 0x9--AAL5-CISCOPPP

Field	Description
virtual-access	Virtual-access interface identifier.
virtual-template	Virtual template identifier.
VCmode	AIP-specific or NPM-specific register describing the usage of the VC. This register contains values such as rate queue, peak rate, and AAL mode, which are also displayed in other fields.
OAM Cell emulation	The status of the OAM cell emulation functionality. It is either enabled or disabled.
F5 end2end AIS xmit frequency	Number of seconds between transmissions of AIS cells.
OAM frequency	Number of seconds between transmissions of OAM loopback cells.
OAM retry frequency	Frequency (in seconds) at which end-to-end F5 loopback cells should be sent when a change in state (up or down) is being verified. For example, if a PVC is up and a loopback cell response is not received after the value of the *frequency* argument (in seconds) specified using the oam-pvc command, loopback cells are sent at the value of the *retry-frequency* argument to determine whether the PVC is down.
OAM up retry count	Number of consecutive end-to-end F5 OAM loopback cell responses that must be received in order to change a PVC state to up. Does not apply to SVCs.
OAM down retry count	Number of consecutive end-to-end F5 OAM loopback cell responses that if not received, change a PVC state to down or tear down an SVC.
OAM Loopback status	Status of end-to-end F5 OAM loopback cell generation for this VC. This field will have one of the following values: • OAM Disabled--End-to-end F5 OAM loopback cell generation is disabled. • OAM Sent--OAM cell was sent. • OAM Received--OAM cell was received. • OAM Failed--OAM reply was not received within the frequency period or contained a bad correlation tag.

Field	Description
OAM VC state	This field will have one of the following states for this VC: • AIS[2]/RDI[3]--The VC received AIS/RDI cells. End-to-end F5 OAM loopback cells are not sent in this state. • Down Retry--An OAM loopback failed. End-to-end F5 OAM loopback cells are sent at retry frequency to verify that the VC is really down. After down-count unsuccessful retries, the VC goes to the Not Verified state. • Not Managed--VC is not being managed by OAM. • Not Verified--VC has not been verified by end-to-end F5 OAM loopback cells. AIS and RDI conditions are cleared. • Up Retry--An OAM loopback was successful. End-to-end F5 OAM loopback cells are sent at retry frequency to verify that the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Verified state. • Verified--Loopbacks are successful. AIS/RDI cell was not received.
OAM Loop detection	Status of loopback detection mode through OAM: • Disabled--Automatic loopback detection is disabled. • Enabled--Automatic loopback detection is enabled. • Detected--Loopback mode is detected on an ATM interface.
ILMI VC state	This field will have one of the following states for this VC: • Not Managed--VC is not being managed by ILMI[4]. • Not Verified--VC has not been verified by ILMI. • Verified--VC has been verified by ILMI.
VC is managed by OAM/ILMI	VC is managed by OAM or ILMI.

Field	Description
InARP frequency	Number of minutes for the Inverse Address Resolution Protocol time period.
InPkts	Total number of packets received on this VC. This number includes all fast-switched and process-switched packets.
OutPkts	Total number of packets sent on this VC. This number includes all fast-switched and process-switched packets.
InBytes	Total number of bytes received on this VC. This number includes all fast-switched and process-switched bytes.
OutBytes	Total number of bytes sent on this VC. This number includes all fast-switched and process-switched bytes.
InPRoc	Number of process-switched input packets.
OutPRoc	Number of process-switched output packets.
Broadcasts	Number of process-switched broadcast packets.
InFast	Number of fast-switched input packets.
OutFast	Number of fast-switched output packets.
InAS	Number of autonomous-switched or silicon-switched input packets.
OutAS	Number of autonomous-switched or silicon-switched output packets.
OAM cells received	Total number of OAM cells received on this VC.
F5 InEndloop	Number of end-to-end F5 OAM loopback cells received.
F5 InSegloop	Number of segment F5 OAM loopback cells received.
F5 InAIS	Number of F5 OAM AIS cells received.
F5 InRDI	Number of F5 OAM RDI cells received.
F4 InEndloop	Number of end-to-end F4 OAM loopback cells received.
F4 InSegloop	Number of segment F4 OAM loopback cells received.

Field	Description
F4 InAIS	Number of F4 OAM AIS cells received.
F4 InRDI	Number of F4 OAM RDI cells received.
OAM cells sent	Total number of OAM cells sent on this VC.
F5 OutEndloop	Number of end-to-end F5 OAM loopback cells sent.
F5 OutSegloop	Number of segment F5 OAM loopback cells sent.
F5 OutRDI	Number of F5 OAM RDI cells sent.
OAM cell drops	Number of OAM cells dropped (or flushed).
PVC Discovery	• NOT_VERIFIED--This PVC is manually configured on the router and not yet verified with the attached adjacent switch. • WELL_KNOWN--This PVC has a VCI value of 0 through 31. • DISCOVERED--This PVC is learned from the attached adjacent switch via ILMI. • MIXED--Some of the traffic parameters for this PVC were learned from the switch via ILMI. • MATCHED--This PVC is manually configured on the router, and the local traffic-shaping parameters match the parameters learned from the switch. • MISMATCHED--This PVC is manually configured on the router, and the local traffic-shaping parameters do not match the parameters learned from the switch. • LOCAL_ONLY--This PVC is configured locally on the router and not on the remote switch.
Status	When the Status field indicates UP, the VC is established. When the Status field indicates DOWN, refer to the State field for further information about the VC state.

Field	Description
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.
PPP	For PPP over ATM, indicates the virtual access interface number and virtual template number being used.
PPPoA Current State	State of the PPPoA session associated with the VC.
PPPoA Latest Event	The latest event that occurred on the PPPoA session associated with the VC.
PPPoA Latest Error	The latest error that occurred on the PPPoA session associated with the VC.
PPPoA Session ID	PPPoA session identifier of the PPPoA session associated with the VC.
PPPoA Handle	PPPoA context handle.
SSS Handle	SSS handle for PPPoA session associated with the VC.
Switch Handle	SSS handle for switch management.
PPP Handle	Handle associated with the PPP context.
AAA Unique ID	Unique identifier associated with the AAA session.

Field	Description
AIE Handle	Access IE handle for the PPPoA session.
Packets in VC Holdq	Number of packets in the hold queue of the VC.
Particles in VC Tx Ring	Number of particles in the Tx ring of the VC.

1 QoS = quality of service
2 AIS = alarm indication signal
3 RDI = remote defect identification
4 ILMI = Interim Local Management Interface

Related Commands

Command	Description
show atm svc	Displays all ATM SVCs and traffic information.
show atm vc	Displays all ATM PVCs and SVCs and traffic information.

show atm pvc dbs

To display all ATM permanent virtual circuits (PVCs) that have Dynamic Subscriber Bandwidth Selection (DBS) quality of service (QoS) parameters applied, use the **show atm pvc dbs** command in privileged EXEC mode.

show atm pvc dbs

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(4)B	This command was introduced.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
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

Use the **show atm pvc dbs** command to display information about ATM PVCs that have DBS QoS parameters applied. To view information about all ATM PVCs in your system, use the **show atm pvc** command.

Examples

he following example displays information about ATM PVCs that have DBS QoS parameters applied:

```
Router# show atm pvc dbs
            VCD /                                          Peak  Avg/Min Burst
Interface   Name       VPI   VCI  Type   Encaps   SC   Kbps   Kbps   Cells Sts
1/0.7       3           0    95   PVC    MUX      VBR    2000    700   94  UP
```

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

Table 6: show atm pvc dbs Field Descriptions

Field	Description
Interface	Identifies the interface and subinterface and the slot number.

Field	Description
VCD/Name	Identifies the Virtual Connection Descriptor (VCD). The connection name is displayed when a name for the virtual circuit was defined using the **pvc** command.
VPI	Identifies the network virtual path identifier (VPI) name for this PVC.
VCI	Identifies the ATM network virtual channel identifier (VCI) for the PVC.
Type	Identifies the type of PVC detected from PVC Discovery. • PVC-D--Indicates a PVC created due to PVC Discovery. • PVC-L--Indicates that the corresponding peer of this PVC could not be found on the switch. • PVC-M--Indicates that some or all of the QoS parameters of this PVC do not match the QoS parameters of the corresponding peer.
Encaps	Identifies the ATM encapsulation type of the VC.
SC	Identifies the service category for the VC.
Peak Kbps	Identifies the number of kilobits per second sent at the peak rate.
Avg/Min Kbps	Identifies the number of kilobits per second sent at the average rate.
Burst Cells	Identifies the burst cell size in terms of number of cells. This number is the maximum number of ATM cells the VC can send at the peak rate.
Sts	Identifies the status of the virtual circuit.

Related Commands

Command	Description
dbs enable	Enables DBS.
pvc	Creates or assigns a name to an ATM PVC, specifies the encapsulation type on an ATM PVC, or enters interface-ATM-VC configuration mode.

Command	Description
pvc-in-range	Configures an individual PVC within a PVC range.
range pvc	Defines a range of ATM PVCs.
show atm pvc	Displays all ATM PVCs and traffic information.
vc-class atm	Configures a VC class for an ATM VC or interface.

show atm signalling statistics

To display ATM signaling statistics counters, use the **show atm signalling statistics** command in user EXEC or privileged EXEC mode.

show atm signalling statistics [**interface** *type number*]

Syntax Description

interface *type number*	(Optional) Specifies the interface type and number.

Command Default

If the interface is not specified, global signalling statistics counters are displayed.

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.
12.2(33)SRC	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SRC.
12.2(33)SXI	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SXI.

Examples

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

```
Router# show atm signalling statistics interface atm 6/0
ATM ATM6/0   UP Time 1d16h  # of int resets: 1
----------------------------------------------------------------
Conn-Pending: 0                 Conn-Pending High Water Mark: 0
Calls Throttled: 0              Max-Conn-Pending:  40
           Messages:   Incoming  Outgoing
           ---------   --------  --------
 PTP Setup Messages:         0         0
 MTP Setup Messages:         0         0
   Release Messages:         0         0
   Restart Messages:         0         0
Status Enq Messages:         0         0
    Status Messages:         0         0
Message:   Received Transmitted Tx-Reject Rx-Reject
 Add Party Messages:          0           0         0         0
      Failure Cause:   Routing     CAC   Access-list    Addr-Reg  Misc-Failure
    Location Local:          0       0             0           0             0
   Location Remote:          0       0             0           0             0
```

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

Table 7: show atm signalling statistics Field Descriptions

Field	Description
Conn-Pending	Indicates the number of pending connections.
Conn-Pending High Water Mark	Indicates the peak number of connections on the controller.
Calls Throttled	Displays the number of calls throttled.
Max-Conn-Pending	Indicates the maximum number of pending connections the controller can accept.
Messages	Indicates the type of messages.
Incoming	Indicates the number of incoming messages for the specified type.
Outgoing	Indicates the number of outgoing messages for the specified type.
Add Party Messages	Indicates the number of additional third-party messages.
Failure Cause	Indicates the cause for the connection failure. The possible causes are as follows: Issues in routing, problems with call admission control (CAC), errors in access lists, errors in address registry, or miscellaneous types of failures.
Location Local	Indicates if the failure occurred at a local location.
Location Remote	Indicates if the failure occurred at a remote location.

Related Commands

Command	Description
atm sig-traffic-shaping strict	Specifies that an SVC should be established on an ATM interface only if shaping can be done in accordance with the signaled traffic parameters.

show atm svc

To display all ATM switched virtual circuits (SVCs) and traffic information, use the **show atm svc** command in privileged EXEC mode.

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

Syntax Description

vpi / *vci*	(Optional) The ATM VPI and VCI numbers. The absence of the slash character **(**/) and a *vpi* value causes the *vpi* value to default to 0.
name	(Optional) Name of the SVC.
interface atm *interface-number*	(Optional) Interface number or subinterface number of the SVC. Displays all SVCs on the specified interface or subinterface. The *interface-number* argument uses one of the following formats, depending on what router platform you are using: • For the AIP on Cisco 7500 series routers; For the ATM port adapter, ATM-CES port adapter, and enhanced ATM port adapter on Cisco 7200 series routers; For the 1-port ATM-25 network module on Cisco 2600 and 3600 series routers : *slot* **/ 0 .** *subinterface-number* **multipoint** • For the ATM port adapter and enhanced ATM port adapter on Cisco 7500 series routers : *slot* **/** *port-adapter* **/ 0 .** *subinterface-number* **multipoint** • For the NPM on Cisco 4500 and 4700 routers : *number* **.** *subinterface-number* **multipoint** For a description of these arguments, refer to the **interface atm** command.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3	This command was introduced.
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.

Usage Guidelines

If the *vpi* / *vci* or *name* argument is not specified, the output of this command is the same as that of the **show atm vc**comm and but only the configured SVCs are displayed. See the first sample output below, which uses the **show atm svc** command without any of the optional arguments.

If the *vpi* / *vci* or *name* argument is specified, the output of this command is the same as the **show atm vc** *vcd* command, plus extra information related to SVC management including connection name, detailed states, and OAM counters. See the second sample output below, which uses the s**how atm svc** command with the *vpi/vci* specified as 0/34.

If the **interface atm** *interface-number* option is included in the command, all SVCs under that interface or subinterface are displayed. See the third sample output below, which uses the **show atm svc** command with the ATM subinterface specified as 2/0.2.

Examples

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

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

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

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

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

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

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

The table below describes significant fields shown in the displays.

Table 8: show atm svc Field Descriptions

Field	Description
Interface	Interface and subinterface slot and port.
VCD/Name	Virtual circuit descriptor (virtual circuit number). The connection name is displayed if a name for the VC was configured using the **svc** command.
VPI	Virtual path identifier.
VCI	Virtual channel identifier.
Type	Type of virtual circuit, either SVC or MSVC (multipoint SVC). • MSVC (with no *-x*) indicates that VCD is a leaf of some other router's multipoint VC. • MSVC-*x* indicates there are *x* leaf routers for that multipoint VC opened by the root.
Encaps	Type of ATM adaptation layer (AAL) and encapsulation.
Peak or PeakRate	Kilobits per second transmitted at the peak rate.
Avg/Min or Average Rate	Kilobits per second transmitted at the average rate.
Burst Cells	Value that equals the maximum number of ATM cells the virtual circuit can transmit at peak rate.

Field	Description
Sts or Status	Status of the VC connection. • UP indicates that the connection is enabled for data traffic. • DN indicates that the connection is down (not ready for data traffic). When the Status field is DN (down), a State field is shown. See a description of the different values for this field listed later in this table. • IN indicates that the interface is down (inactive).
Connection Name	The name of the SVC.
UBR, UBR+, or VBR-NRT	UBR--Unspecified Bit Rate QoS is specified for this SVC. See the **ubr** command for further information. UBR+--Unspecified Bit Rate QoS is specified for this SVC. See the **ubr+** command for further information. VBR-NRT--Variable Bit Rate-Non Real Time QoS rates are specified for this SVC. See the **vbr-nrt** command for further information.
etype	Encapsulation type.
Flags	Bit mask describing virtual circuit information. The flag values are summed to result in the displayed value. 0x40--SVC 0x20--PVC 0x10--ACTIVE 0x0--AAL5-SNAP 0x1 --AAL5-NLPID 0x2--AAL5-FRNLPID 0x3--AAL5-MUX 0x4--AAL3/4-SMDS 0x5--QSAAL 0x6--ILMI 0x7--AAL5-LANE 0x9--AAL5-CISCOPPP

Field	Description
VCmode	AIP-specific or NPM-specific register describing the usage of the virtual circuit. This register contains values such as rate queue, peak rate, and AAL mode, which are also displayed in other fields.
OAM frequency	Number of seconds between sending OAM loopback cells.
OAM retry frequency	The frequency (in seconds) that end-to-end F5 loopback cells should be transmitted when a change in UP/DN (up/down) state is being verified. For example, if an SVC is up and a loopback cell response is not received after the *frequency* (in seconds) specified using the **oam-svc** command, then loopback cells are sent at the *retry-frequency* to verify whether the SVC is down.
OAM up retry count	Number of consecutive end-to-end F5 OAM loopback cell responses that must be received in order to change a PVC state to up. Does not apply to SVCs.
OAM down retry count	Number of consecutive end-to-end F5 OAM loopback cell responses that are not received in order to change a PVC state to down or tear down an SVC.
OAM Loopback status	Status of end-to-end F5 OAM loopback cell generation for this VC. This field will have one of the following values: • OAM Disabled--End-to-End F5 OAM loopback cell generation is disabled. • OAM Sent--OAM cell was sent. • OAM Received--OAM cell was received. • OAM Failed--OAM reply was not received within the frequency period or contained bad correlation tag.ssss.

Field	Description
OAM VC state	This field will have one of the following states for this VC: • AIS/RDI--The VC received AIS/RDI cells. End-to-end F5 OAM loopback cells are not sent in this state. • Down Retry--An OAM loopback failed. End-to-end F5 OAM loopback cells are sent at retry frequency to verify the VC is really down. After down-count unsuccessful retries, the VC goes to the Not Verified state. • Not Managed--VC is not being managed by OAM. • Not Verified--VC has not been verified by end-to-end F5 OAM loopback cells. AIS and RDI conditions are cleared. • Up Retry--An OAM loopback was successful. End-to-end F5 OAM loopback cells are sent at retry frequency to verify the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Verified state. • Verified--Loopbacks are successful. AIS/RDI cell was not received.
ILMI VC state	This field will have one of the following states for this VC: • Not Managed--VC is not being managed by ILMI. • Not Verified--VC has not been verified by ILMI. • Verified--VC has been verified by ILMI.
VC is managed by OAM/ILMI	VC is managed by OAM and/or ILMI.
InARP frequency	Number of minutes for the Inverse ARP time period.
InPkts	Total number of packets received on this virtual circuit. This number includes all fast-switched and process-switched packets.
OutPkts	Total number of packets sent on this virtual circuit. This number includes all fast-switched and process-switched packets.

Field	Description
InBytes	Total number of bytes received on this virtual circuit. This number includes all fast-switched and process-switched bytes.
OutBytes	Total number of bytes sent on this virtual circuit. This number includes all fast-switched and process-switched bytes.
InPRoc	Number of process-switched input packets.
OutPRoc	Number of process-switched output packets.
Broadcasts	Number of process-switched broadcast packets.
InFast	Number of fast-switched input packets.
OutFast	Number of fast-switched output packets.
InAS	Number of autonomous-switched or silicon-switched input packets.
OutAS	Number of autonomous-switched or silicon-switched output packets.
OAM cells received	Total number of OAM cells received on this virtual circuit.
F5 InEndloop	Number of end-to-end F5 OAM loopback cells received.
F5 InSegloop	Number of segment F5 OAM loopback cells received.
F5 InAIS	Number of F5 OAM AIS cells received.
F5 InRDI	Number of F5 OAM RDI cells received.
F4 InEndloop	Number of end-to-end F4 OAM loopback cells received.
F4 InSegloop	Number of segment F4 OAM loopback cells received.
F4 InAIS	Number of F4 OAM AIS cells received.
F4 InRDI	Number of F4 OAM RDI cells received.
OAM cells sent	Total number of OAM cells sent on this virtual circuit.
F5 OutEndloop	Number of end-to-end F5 OAM loopback cells sent.

Field	Description
F5 OutSegloop	Number of segment F5 OAM loopback cells sent.
F5 OutRDI	Number of F5 OAM RDI cells sent.
OAM cell drops	Number of OAM cells dropped (or flushed).
State	When the Status field is DN (down) or IN (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.
TTL	Time-to-live in ATM hops across the VC.
VC owner	IP Multicast address of group.

show atm traffic

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

show atm traffic

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
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 atm traffic**command for the ATM-CES port adapter on a Cisco 7200 series router:

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

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

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

The table below describes the fields shown in the display.

Table 9: show atm traffic Field Descriptions

Field	Description
Input packets	Total packets input.
Output packets	Total packets output (nonbroadcast).
Broadcast packets	Total broadcast packets output.
Packets received on nonexistent VC	Number of packets sent to virtual circuits not configured.
Packets attempted to send on non-existent VC	Number of packets attempted to be sent on a virtual circuit that were not configured.
OAM cells received	Total Operation, Administration, and Maintenance (OAM) cells received.
F5 InEndloop	Number of end-to-end F5 OAM loopback cells received.
F5 InSegloop	Number of segment F5 OAM loopback cells received.
F5 InAIS	Number of F5 OAM AIS cells received.
F5 InRDI	Number of F5 OAM RDI cells received.
F4 InEndloop	Number of end-to-end F4 OAM loopback cells received.
F4 InSegloop	Number of segment F4 OAM loopback cells received.
F4 InAIS	Number of F4 OAM AIS cells received.
F4 InRDI	Number of F4 OAM RDI cells received.
OAM cells sent	Total number of OAM cells sent on this VC.
F5 OutEndloop	Number of end-to-end F5 OAM loopback cells sent.
F5OutSegloop	Number of segment F5 OAM loopback cells sent.
F5 OutRDI	Number of F5 OAM RDI cells sent.
OAM cell drops	Number of OAM cells dropped (or flushed).

Related Commands

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

show atm vc

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

show atm vc [*vcd-number*| **range** *lower-limit-vcd upper-limit-vcd*] [**interface atm** *interface-number*] [**detail** [**prefix** {**vpi/vci**| **vcd**| **interface**| **vc_name**}]] [*connection-name*] [**signalling** [**freed-svcs**| [**cast-type** {**p2mp**| **p2p**}]]] **[detail]** [**interface atm** *interface-number*| **summary atm** *interface-number*]

Syntax Description

vcd-number	(Optional) Specifies a unique virtual circuit descriptor (VCD) number that identifies PVCs within one ATM interface.
range *lower-limit-vcd upper-limit-vcd*	(Optional) Specifies the range of VCs. Displays all the VC information for the specified range of VCDs. The *lower-limit-vcd* argument specifies the lower limit of the VCD range. The *upper-limit-vcd* argument specifies the upper limit of the VCD range.
interface atm *interface-number*	(Optional) Interface number or subinterface number of the PVC or SVC. Displays all PVCs and SVCs on the specified interface or subinterface. The *interface-number* uses one of the following formats, depending on the router platform you use: • For the ATM Interface Processor (AIP) on Cisco 7500 series routers; for the ATM port adapter, ATM-CES port adapter, and enhanced ATM port adapter on Cisco 7200 series routers; for the 1-port ATM-25 network module on Cisco 2600 and 3600 series routers: *slot* **/ 0 .** *subinterface-number* **multipoint** • For the ATM port adapter and enhanced ATM port adapter on Cisco 7500 series routers : *slot* **/** *port-adapter* **/ 0 .** *subinterface-number* **multipoint** • For the network processing module (NPM) on Cisco 4500 and Cisco 4700 routers : *number* **.** *subinterface-number* **multipoint** • For a description of these arguments, refer to the **interface atm** command.
detail	(Optional) Displays the detailed information about the VCs.

prefix	(Optional) Displays detailed information about the selected VC category. You must specify one of the following VC categories: • **vpi/vci** --Virtual path identifier and virtual channel identifier. • **vcd** --Virtual circuit descriptor. • **interface** --Interface in which the VCD is configured. • **vc_name** --Name of the PVC or SVC.
connection-name	(Optional) Connection name of the PVC or SVC.
signalling	(Optional) Displays the ATM interface signaling information for all the interfaces.
freed-svcs	(Optional) Displays the details of the last few freed SVCs.
cast-type	(Optional) SVC cast type. You must specify one of the following connections: • **p2mp** --Point to multipoint connection. • **p2p** --Point to point connection.
summary atm *interface-number*	(Optional) Displays a summary of VCs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
11.1CA	This command was modified. Information about VCs on an ATM-CES port adapter was added to the command output.
12.0(5)T	This command was modified. Information about VCs on an extended Multiprotocol Label Switching (MPLS) ATM interface was added to the command output.
12.2(25)S	This command was modified. Information about packet drops and errors was added to the command output.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB and implemented on the Cisco 10000 series routers.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB and the **signalling** keyword was added.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE 2.3	This command was implemented on the Cisco ASR 1000 series routers.

Usage Guidelines

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

VCs on the extended MPLS ATM interfaces do not appear in the **show atm vc** command output. Instead, the **show xtagatm vc** command provides a similar output that shows information only on extended MPLS ATM VCs.

Note The SVCs and the **signalling** keyword are not supported on the Cisco ASR 1000 series routers.

Examples

The following is sample output from the **show atm vc** command when no value for the *vcd* argument is specified. The status field is either ACTIVE or IN (inactive).

```
Router# show atm vc
Interface     VCD   VPI   VCI Type  AAL/Encaps     Peak   Avg.  Burst Status
ATM2/0          1     0     5  PVC  AAL5-SAAL     155000 155000    93 ACTIVE
ATM2/0.4        3     0    32  SVC  AAL5-SNAP     155000 155000    93 ACTIVE
ATM2/0.65432   10    10    10  PVC  AAL5-SNAP     100000  40000    10 ACTIVE
ATM2/0         99     0    16  PVC  AAL5-ILMI     155000 155000    93 ACTIVE
ATM2/0.105    250    33    44  PVC  AAL5-SNAP     155000 155000    93 ACTIVE
ATM2/0.100    300    22    33  PVC  AAL5-SNAP     155000 155000    93 ACTIVE
ATM2/0.12345 2047   255 65535  PVC  AAL5-SNAP         56     28  2047 ACTIVE
```

The following is sample output from the **show atm vc** command when a *vcd* value is specified for a circuit emulation service (CES) circuit:

```
Router# show atm vc 2
ATM6/0: VCD: 2, VPI: 10, VCI: 10
PeakRate: 2310, Average Rate: 2310, Burst Cells: 94
CES-AAL1, etype:0x0, Flags: 0x20138, VCmode: 0x0
OAM DISABLED
InARP DISABLED
OAM cells received: 0
OAM cells sent: 334272
Status: ACTIVE
```

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

```
Router# show atm vc 8
ATM4/0: VCD: 8, VPI: 8, VCI: 8
PeakRate: 155000, Average Rate: 155000, Burst Cells: 0
AAL5-LLC/SNAP, etype:0x0, Flags: 0x30, VCmode: 0xE000
OAM frequency: 0 second(s)
InARP frequency: 1 minute(s)
```

```
InPkts: 181061, OutPkts: 570499, InBytes: 757314267, OutBytes: 2137187609
InPRoc: 181011, OutPRoc: 10, Broadcasts: 570459
InFast: 39, OutFast: 36, InAS: 11, OutAS: 6
OAM cells received: 0
OAM cells sent: 0
Status: UP
```

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

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

The following is sample output from the **show atm vc** command when a *vcd* value is specified and generation of Operation, Administration, and Maintenance (OAM) F5 loopback cells has been enabled:

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

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

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

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

```
Router# show atm vc 6
ATM2/0: VCD: 6, VPI: 0, VCI: 35
PeakRate: 0, Average Rate: 0, Burst Cells: 0
AAL5-MUX, etype:0x800, Flags: 0x53, VCmode: 0xE000
OAM DISABLED
InARP DISABLED
InPkts: 0, OutPkts: 818, InBytes: 0, OutBytes: 37628
InPRoc: 0, OutPRoc: 0, Broadcasts: 818
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
interface =  ATM2/0, call locally initiated, call reference = 3
vcnum = 6, vpi = 0, vci = 35, state = Active
 aal5mux vc, multipoint call
Retry count: Current = 0, Max = 10
```

```
timer currently inactive, timer value = never
Leaf Atm Nsap address: DE.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
Leaf Atm Nsap address: CD.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.12
```

The following is sample output from the **show atm vc** command when a *vcd* value is specified and there is a PPP-over-ATM connection:

```
Router# show atm vc 1
ATM8/0.1: VCD: 1, VPI: 41, VCI: 41
PeakRate: 155000, Average Rate: 155000, Burst Cells: 96
AAL5-CISCOPPP, etype:0x9, Flags: 0xC38, VCmode: 0xE000
virtual-access: 1, virtual-template: 1
OAM DISABLED
InARP DISABLED
InPkts: 13, OutPkts: 10, InBytes: 198, OutBytes: 156
InPRoc: 13, OutPRoc: 10, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM cells received: 0
OAM cells sent: 0
```

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

```
Router# show atm vc
             VCD/                                      Peak     Avg/Min     Burst
Interface    Name  VPI   VCI   Type     Encaps          Kbps      Kbps      Cells         Sts
0/0          1       0     5     PVC      SAAL       155000    155000       96           UP
0/0          2       0    16     PVC      ILMI       155000    155000       96           UP
0/0          3       0   124 MSVC-3      SNAP       155000    155000       96           UP
0/0          4       0   125   MSVC      SNAP       155000    155000       96           UP
0/0          5       0   126   MSVC      SNAP       155000    155000       96           UP
0/0          6       0   127   MSVC      SNAP       155000    155000       96           UP
0/0          9       0   130   MSVC      SNAP       155000    155000       96           UP
0/0          10      0   131    SVC      SNAP       155000    155000       96           UP
0/0          11      0   132 MSVC-3      SNAP       155000    155000       96           UP
0/0          12      0   133 MSVC-1      SNAP       155000    155000       96           UP
0/0          13      0   134    SVC      SNAP       155000    155000       96           UP
0/0          14      0   135 MSVC-2      SNAP       155000    155000       96           UP
0/0          15      0   136 MSVC-2      SNAP       155000    155000       96           UP
```

The following is sample output from the **show atm vc** command for an IP multicast virtual circuit. The display shows the owner of the VC and leaves of the multipoint VC. This VC was opened by IP multicast. The three leaf routers' ATM addresses are included in the display. The VC is associated with IP group address 10.1.1.1.

```
Router# show atm vc 11
ATM0/0: VCD: 11, VPI: 0, VCI: 132
PeakRate: 155000, Average Rate: 155000, Burst Cells: 96
AAL5-LLC/SNAP, etype:0x0, Flags: 0x650, VCmode: 0xE000
OAM DISABLED
InARP DISABLED
InPkts: 0, OutPkts: 12, InBytes: 0, OutBytes: 496
InPRoc: 0, OutPRoc: 0, Broadcasts: 12
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM cells received: 0
OAM cells sent: 0
Status: ACTIVE, TTL: 2, VC owner: IP Multicast (10.1.1.1)
interface =  ATM0/0, call locally initiated, call reference = 2
vcnum = 11, vpi = 0, vci = 132, state = Active
 aal5snap vc, multipoint call
Retry count: Current = 0, Max = 10
timer currently inactive, timer value = 00:00:00
Leaf Atm Nsap address: 47.0091810000000002BA08E101.444444444444.02
Leaf Atm Nsap address: 47.0091810000000002BA08E101.333333333333.02
Leaf Atm Nsap address: 47.0091810000000002BA08E101.222222222222.02
```

The following is sample output from the **show atm vc** command where no VCD is specified and private VCs are present:

```
Router# show atm vc
AAL /         Peak   Avg.  Burst
Interface     VCD   VPI   VCI Type  Encapsulation  Kbps   Kbps  Cells Status
ATM1/0          1     0    40  PVC  AAL5-SNAP          0      0     0 ACTIVE
ATM1/0          2     0    41  PVC  AAL5-SNAP          0      0     0 ACTIVE
ATM1/0          3     0    42  PVC  AAL5-SNAP          0      0     0 ACTIVE
ATM1/0          4     0    43  PVC  AAL5-SNAP          0      0     0 ACTIVE
ATM1/0          5     0    44  PVC  AAL5-SNAP          0      0     0 ACTIVE
ATM1/0         15     1    32  PVC  AAL5-XTAGATM       0      0     0 ACTIVE
ATM1/0         17     1    34  TVC  AAL5-XTAGATM       0      0     0 ACTIVE
ATM1/0         26     1    43  TVC  AAL5-XTAGATM       0      0     0 ACTIVE
ATM1/0         28     1    45  TVC  AAL5-XTAGATM       0      0     0 ACTIVE
ATM1/0         29     1    46  TVC  AAL5-XTAGATM       0      0     0 ACTIVE
ATM1/0         33     1    50  TVC  AAL5-XTAGATM       0      0     0 ACTIVE
```

When you specify a VCD value and the VCD corresponds to that of a private VC on a control interface, the display output appears as follows:

```
Router# show atm vc 15
ATM1/0 33     1    50  TVC  AAL5-XTAGATM       0      0     0 ACTIVE
ATM1/0: VCD: 15, VPI: 1, VCI: 32, etype:0x8, AAL5 - XTAGATM, Flags: 0xD38
PeakRate: 0, Average Rate: 0, Burst Cells: 0, VCmode: 0x0
XTagATM1, VCD: 1, VPI: 0, VCI: 32
OAM DISABLED, InARP DISABLED
InPkts: 38811, OutPkts: 38813, InBytes: 2911240, OutBytes: 2968834
InPRoc: 0, OutPRoc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM F5 cells sent: 0, OAM cells received: 0
Status: ACTIVE
```

The table below describes the fields shown in the displays.

Table 10: show atm vc Field Descriptions

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

Field	Description
Type	Type of VC, either PVC, SVC, TVC, or multipoint SVC (MSVC). • MSVC (with no -*x*) indicates that VCD is a leaf of some other router's multipoint VC. • MSVC-*x* indicates there are *x* leaf routers for that multipoint VC opened by the root. Type of PVC detected from PVC discovery, either PVC-D, PVC-L, or PVC-M. • PVC-D indicates a PVC created due to PVC discovery. • PVC-L indicates that the corresponding peer of this PVC could not be found on the switch. • PVC-M indicates that some or all of the quality of service (QoS) parameters of this PVC do not match those of the corresponding peer on the switch. • TVC indicates a Tag VC.
Encaps	Type of ATM adaptation layer (AAL) and encapsulation.
PeakRate	Kilobits per second sent at the peak rate.
Average Rate	Kilobits per second sent at the average rate.
Burst Cells	Value that equals the maximum number of ATM cells the VC can send at peak rate.
Status	Status of the VC connection. • UP indicates that the connection is enabled for data traffic. • DN indicates that the connection is down (not ready for data traffic). When the Status field is DN (down), a State field is shown. • IN indicates that the interface is down (inactive). • ACTIVE indicates that the interface is in use and active.
etype	Encapsulation type.

Field	Description
Flags	Bit mask describing VC information. The flag values are summed to result in the displayed value. 0x10000 ABR VC 0x20000 CES VC 0x40000 TVC 0x100 TEMP (automatically created) 0x200 MULTIPOINT 0x400 DEFAULT_RATE 0x800 DEFAULT_BURST 0x10 ACTIVE 0x20 PVC 0x40 SVC 0x0 AAL5-SNAP 0x1 AAL5-NLPID 0x2 AAL5-FRNLPID 0x3 AAL5-MUX 0x4 AAL3/4-SMDS 0x5 QSAAL 0x6 AAL5-ILMI 0x7 AAL5-LANE 0x8 AAL5-XTAGATM 0x9 CES-AAL1 0xA F4-OAM
VCmode	AIP-specific or NPM-specific register describing the usage of the VC. This register contains values such as rate queue, peak rate, and AAL mode, which are also displayed in other fields.
OAM frequency	Seconds between OAM loopback messages, or DISABLED if OAM is not in use on this VC.
InARP frequency	Minutes between Inverse Address Resolution Protocol (InARP) messages, or DISABLED if InARP is not in use on this VC.
virtual-access	Virtual access interface identifier.
virtual-template	Virtual template identifier.
InPkts	Total number of packets received on this VC. This number includes all fast-switched and process-switched packets.
OutPkts	Total number of packets sent on this VC. This number includes all fast-switched and process-switched packets.
InBytes	Total number of bytes received on this VC. This number includes all fast-switched and process-switched packets.
OutBytes	Total number of bytes sent on this VC. This number includes all fast-switched and process-switched packets.
InPRoc	Number of process-switched input packets.
OutPRoc	Number of process-switched output packets.

Field	Description
Broadcasts	Number of process-switched broadcast packets.
InFast	Number of fast-switched input packets.
OutFast	Number of fast-switched output packets.
InAS	Number of autonomous-switched or silicon-switched input packets.
VC TxRingLimit	Transmit Ring Limit for this VC.
VC Rx Limit	Receive Ring Limit for this VC.
Transmit priority	ATM service class transmit priority for this VC.
InCells	Number of incoming cells on this VC.
OutCells	Number of outgoing cells on this VC.
InPktDrops	A non-zero value for the InPktDrops of a VC counter suggests that the ATM interface is running out of packet buffers for an individual VC, or is exceeding the total number of VC buffers that can be shared by the VCs.
OutPktDrops	The PA-A3 driver increments the OutPktDrops counter when a VC fills its individual transmit buffer quota. The purpose of the quota is to prevent a consistently oversubscribed VC from grabbing all of the packet buffer resources and hindering other VCs from transmitting normal traffic within their traffic contracts.
InCellDrops	Number of incoming cells dropped on this VC.
OutCellDrops	Number of outgoing cells dropped on this VC.
InByteDrops	Number of incoming bytes that are dropped on this VC.
OutByteDrops	Number of outgoing bytes that are dropped on this VC.
CrcErrors	Number of cyclic redundancy check (CRC) errors on this VC.
SarTimeOuts	Number of segmentation and reassembly sublayer time-outs on this VC.

Field	Description
OverSizedSDUs	Number of over-sized service data units on this VC
LengthViolation	Number of length violations on this VC. A length violation occurs when a reassembled packet is dropped without checking the CRC.
CPIErrors	The Common Part Indicator error field is a one octet field in the AAL5 encapsulation of an ATM cell and must be set to 0. If it is received with some other value, it is flagged as an error by the interface. For example, this error may indicate data corruption.
Out CLP	Number of packets or cells where the Output Cell Loss Priority bit is set.
OutAS	Number of autonomous-switched or silicon-switched output packets.
OAM cells received	Number of OAM cells received on this VC.
OAM cells sent	Number of OAM cells sent on this VC.
TTL	Time to live in ATM hops across the VC.
VC owner	IP Multicast address of the group.

Related Commands

Command	Description
atm nsap-address	Sets the NSAP address for an ATM interface using SVC mode.
show xtagatm vc	Displays information about the VCs on the extended MPLS ATM interfaces.

show atm vp

To display the statistics for all virtual paths (VPs) on an interface or for a specific VP, use the **show atm vp**command in privileged EXEC mode.

show atm vp [*vpi*]

Syntax Description

vpi	(Optional) ATM network virtual path identifier (VPI) of the permanent virtual path. The range is from 0 to 255. The VPI is an 8-bit field in the header of the ATM cell.

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)SB	This command was enhanced in Cisco IOS Release 12.2(33)SB to support VP-based rate counters and enable you to display the average traffic load on the VP for the last 5 minutes. This was implemented on the Cisco 10000 series router for the PRE3 and PRE4.

Usage Guidelines

Cisco 10000 Series Router

In Cisco IOS Release 12.2(33)SB, the output from the show atm vp command nolonger displays “ATM” as the type of interface, as shown in the following sample output:

```
Router# show atm vp
 Data CES PEAK CES Avg/Min Burst MCR
Interface VPI SC VCs VCs Kbps Kbps Kbps Cells Kbps CDVT Status
3/0/0 200 N/A 0 0 2000 0 NA NA NA 140.0 ACTIVE
```

In Cisco IOS Release 12.2(31)SB, the output from the show atm vp command displays the ATM interface type:

```
Router# show atm vp
 Data CES PEAK CES Avg/Min Burst MCR CDVT
Interface VPI SC VCs VCs Kbps Kbps Kbps Cells Kbps Usecs Status
ATM3/0/0 200  0 0 2000 0 NA NA NA 140.0 ACTIVE
```

Examples

The following is sample output from the **show atm vp**command. This output shows the interface name, the status of the interface, the administrative status of the interface, the port type, and the number of channels in use on the interface. The status of the interface can be UP (in operation) or DOWN (not in operation).

```
Router# show atm vp 1
ATM6/0  VPI: 1, PeakRate: 155000, CesRate: 1742, DataVCs: 1, CesVCs:1, Status: ACTIVE

     VCD    VCI   Type   InPkts   OutPkts   AAL/Encap     Status
     1      100   PVC    n/a      n/a       CES-AAL1      ACTIVE
     13     13    PVC    0        0         AAL5-SNAP     ACTIVE
     409    3     PVC    0        0         F4 OAM        ACTIVE
     410    4     PVC    0        0         F4 OAM        ACTIVE

   TotalInPkts: 0, TotalOutPkts: 0, TotalInFast: 0, TotalOutFast: 0, TotalBroadcasts: 0
```

The table below describes the fields shown in the display.

Table 11: show atm vp Field Descriptions

Field	Description
ATM6/0	Interface type, slot, and port number of the VP.
VPI	Virtual path identifier of the VP.
PeakRate	Maximum rate, in kbps, at which the VP can send data. Range is 84 kbps to line rate. The default is the line rate.
CesRate	Total circuit emulation service (CES) bandwidth allocated for the VP.
DataVCs	Number of data virtual circuits (VCs) on the VP.
CesVCs	Number of CES VC on the VP.
Status	Current status of the VP. Values are ACTIVE and INACTIVE.
VCD	Virtual circuit descriptor of the VC associated with this VP.
VCI	Virtual channel identifier of the VC associated with this VP.
Type	Type of VC associated with this VP. Values are PVC and SVC.
InPkts	Number of packets received on the VP.
OutPkts	Number of packets transmitted on the VP.

Field	Description
AAL/Encap	Type of encapsulation used on the VC associated with this VP.
Status	Status of the VP (ACTIVE or INACTIVE).
TotalInPkts:	Total number of input packets process-switched and fast-switched on the VP.
TotalOutPkts:	Total number of output packets process-switched and fast-switched on the VP.
TotalInFast	Total number of input packets fast-switched.
TotalOutFast:	Total number of output packets fast-switched.
TotalBroadcasts:	Total number of broadcast packets fast-switched.

Related Commands

Command	Description
atm pvp	Creates a PVP used to multiplex (or bundle) one or more VCs (especially CES and data VCs).

show ces

To display details about a Circuit Emulation Service (CES) connection, use the **show ces**privileged EXEC command.

show ces{*slot*/*port*}

Syntax Description

slot port	(Optional) Slot and port number of the CES interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(2)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.

Usage Guidelines

This command is used on Cisco 2600 series and Cisco 3600 series routers that have OC-3/STM-1 ATM CES network modules.

Examples

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

```
Router# show ces 3/0
CURRENT VPD CES CLOCK:Set to ATM
ATM CLOCKING:Clock Source is Line
VPD BASE ADDRESS->(0x3DE00000)
Multi Mode VPD Installed
VIC/WIC PRESENT->  2 port drop&insert T1 humvee installed
CONTROLLER CLOCKING-> PORT[0]:Clock is Internal
CONTROLLER CLOCKING-> PORT[1]:Clock is Internal
DCU [0]:
 port State:   active       alarm State:normal         Loop Type:   noloop
 Clocking Mode:loopTimed  Data Mode:  crossConnect   Framing Type:  d4
 Line Coding:  ami          t1Cas:      off            tsInUse:     0000001C
  VPI/VCI 6/78  CES AAL1 Input cells 210252  CES AAL1 Output cells 210252
       imRestart 0  xcUndfrmslp 2  overflow 0
DCU [1]:
 port State:   inactive     alarm State:normal         Loop Type:   noloop
 Clocking Mode:synchronous  Data Mode:  clearChannel   Framing Type:none
 Line Coding:  ami          t1Cas:      off            tsInUse:     00000000
DCU [2]:
 port State:   inactive     alarm State:normal         Loop Type:   noloop
 Clocking Mode:synchronous  Data Mode:  clearChannel   Framing Type:none
 Line Coding:  ami          t1Cas:      off            tsInUse:     00000000
```

```
DCU [3]:
 port State:   inactive     alarm State:normal         Loop Type:   noloop
 Clocking Mode:synchronous  Data Mode:  clearChannel   Framing Type:none
 Line Coding:  ami          t1Cas:      off            tsInUse:     00000000
```

The table below describes significant fields shown in the display.

Table 12: show ces Field Descriptions

Field	Description
CURRENT VPD CES CLOCK	Clock being used by the CES function.
ATM CLOCKING	Clock being used by the ATM interface.
VIC/WIC PRESENT	Type of WIC plugged into the Network Module.
CONTROLLER CLOCKING	Clock being used by the T1 controller.
port State	Current state of port. Values are active or inactive.
alarm State	Current state of the CES port.
Clocking Mode	CES circuit clocking mode.
Data Mode	CES circuit data mode.
Framing Type	CES port framing type. Values are d4 and esf.
Line Coding	CES port line code type. Values are ami and b8zs.
t1Cas	Current state of T1 Channel Associated Signalling on CES port. Values are on and off.
tsInUse	Bit mask of timeslots in use.
VPI/VCI	VPI/VCI used by CES circuit.
CES AAL1 Input cells	Number of CES cells received.
CES AAL1 Output cells	Number of CES cells transmitted.
xcUndfrmslp	Structured CES circuit Under Frame Slips.
overflow	CES circuit overflows.

Related Commands

Command	Description
ces	Configures CES on a router port.

show ces circuit

To display detailed circuit information for the constant bit rate (CBR) interface, use the **show ces circuit** command in privileged EXEC mode.

show ces circuit[**interface cbr** *slot*/*port*[*circuit-number*]]

Syntax Description

interface cbr *slot* / *port*	(Optional) Slot and port number of the CBR interface.
circuit-number	(Optional) Circuit identification. For unstructured service, use 0. For T1 structure service, the range is from 1 to 24. For E1 structure service, the range is from 1 to 31.

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.

Examples

The following is sample output from the **show ces circuit** command.

```
Router # show ces circuit
Interface  Circuit  Circuit-Type     X-interface   X-vpi   X-vci  Status
 CBR6/0      1       HardPVC           ATM6/0        0        34  UP
 CBR6/1      1       HardPVC           ATM6/1        0        34  UP
```

The table below describes the fields shown in the display.

Table 13: show ces circuit Field Descriptions

Field	Description
Interface	Type, slot, and port number of the interface.
Circuit	Circuit number assigned to the PVC.

Field	Description
Circuit-Type	Type of circuit.Values are HardPVC or SoftPVC. Only HardPVC is supported on the ATM-CES port adapter.
X-interface	Type, slot, and port number of the destination interface.
X-vpi	Virtual path identifier of the destination interface.
X-vci	Virtual channel identifier of the destination interface.
Status	State of the circuit. Values are Up and Down.

The following is sample output from the **show ces circuit** command for a circuit 1 on CBR interface 6/0:

```
Router# show ces circuit interface cbr 6/0 1
circuit: Name CBR6/0:1, Circuit-state ADMIN_UP / Interface CBR6/0, Circuit_id 1,
Port-Type T1, Port-State UP
Port Clocking network-derived, aal1 Clocking Method CESIWF_AAL1_CLOCK_Sync
Channel in use on this port: 1
Channels used by this circuit: 1
Cell-Rate: 171, Bit-Rate 64000
cas OFF, cell-header 0X3E80 (vci = 1000)
Configured CDV 2000 usecs, Measured CDV unavailable
ErrTolerance 8, idleCircuitdetect OFF, onHookIdleCode 0x0
state: VcActive, maxQueueDepth       128, startDequeueDepth       111
Partial Fill:       47, Structured Data Transfer 24
HardPVC
src: CBR6/0 vpi 0, vci 16
Dst: ATM6/0 vpi0, vci 1000
```

The table below describes the fields shown in the display.

Table 14: show ces circuit interface Field Descriptions

Field	Description
circuit Name	Name of the circuit specified with the **ces circuit**interface command.
Circuit-state	Current configuration state of the circuit. Values are ADMIN_UP or ADMIN_DOWN.
Interface	Type, slot, and port number of the interface.
Circuit_ID	Circuit identification specified with the **ces pvc** interface command.
Port-Type	Type of interface on the ATM-CES port adapter. Values are T1 and E1.
Port-State	Current status of the port. Values are Up and Down.

Field	Description
Port Clocking	Clocking mode used by the interface specified with the **ces dsx1 clock** interface command. Values are Loop-Timed and Network-Derived Adaptive.
aal1 Clocking Method	AAL1 clocking mode used by the interface specified with the **ces aal1 clock** interface command. Values are Adaptive, Synchronous Residual Time Stamp (SRTS), and Synchronous.
Channel in use on this port	Number of active channels used by this interface.
Channels used by this circuit	Number of channels used by the circuit.
Cell-Rate	Number of cells transmitted or received on the interface per second.
Bit-Rate	Speed at which the cells are transmitted or received.
cas	Indicates whether channel-associated signaling (CAS) is enabled on the interface with the **ces circuit**interface command.
cell-header	ATM cell header VCI bytes used for debugging only.
Configured CDV	Indicates the peak-to-peak cell delay variation (CDV) requirement (CDV) in milliseconds specified with the **ces circuit**interface command. The range for CDV is 1 through 65535 milliseconds. The default is 2000 milliseconds.
Measured CDV	Indicates the actual cell delay variation in milliseconds.
ErrTolerance	For internal use only.
idleCircuitdetect	Indicates whether idle circuit detection is enabled (ON) or disabled (OFF).
onHookIdleCode	Indicates that the on-hook detection feature is enabled with the **ces circuit** interface command and the hex value (0 through F) that indicates a 2 or 4 bit AB[CD] pattern to detect on-hook. The AB[CD] bits are determined by the manufacturer of the voice/video telephony device that is generating the CBR traffic.
state	Current state of the circuit. Values are VcActive, VcInactive, VcLOC (loss of cell), or VcAlarm (alarm condition).

Field	Description
maxQueueDepth	Maximum queue depth in bits.
startDequeueDepth	Start dequeue depth in bits.
Partial Fill	Indicates the partial AAL1 cell fill service for structured service only specified by the **ces circuit** interface command. The range is 0 through 47. The default is 47.
Structured Data Transfer	Size (in bytes) of the structured data transfer frame.
HardPVC	Only hard PVC are supported by the ATM-CES port adapter.
src	Source interface type, slot, and port number and VPI and VCI for the circuit.
Dst	Destination interface interface type, slot, and port number and the VPI and VCI for the circuit.

Related Commands

Command	Description
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces status	Displays the status of the ports on the ATM-CES port adapter.

show ces interface cbr

To display detailed constant bit rate (CBR) port information, use the **show ces interface cbr**command in privileged EXEC mode.

show ces interface cbr*slot/port*

Syntax Description

slot /port	Slot and port number of the CES interface.

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.

Examples

The following is sample output from the **show ces interface cbr**command for CBR interface 6/0:

```
Router# show ces interface cbr 6/0
Interface:      CBR6/0          Port-type:T1-DCU
IF Status:      UP              Admin Status: UP
Channels in use on this port: 1
LineType: ESF           LineCoding: B8ZS  LoopConfig: NoLoop
SignalMode: NoSignalling   XmtClockSrc: network-derived
DataFormat: Structured     AAL1 Clocking Mode: Synchronous  LineLength: 0_110
LineState: LossOfSignal
Errors in the Current Interval:
  PCVs        0   LCVs        0   ESs         0   SESs        0   SEFSs        0
  UASs        0   CSSs        0   LESs        0   BESs        0   DMs          0
Errors in the last 24Hrs:
  PCVs      514   LCVs        0   ESs         0   SESs        1   SEFSs        0
  UASs        0   CSSs        0   LESs        0   BESs        0   DMs          0
Input  Counters: 0 cells, 0 bytes
Output Counters: 0 cells, 0 bytes
```

The table below describes the fields shown in the display.

Table 15: show ces interface cbr Field Descriptions

Field	Description
Interface	Type, slot, and port number of the interface.

Field	Description
Port-type	Type of port on the ATM-CES port adapter. Values are T1-DCU and E1-DCU.
IF Status	Status of the interface. Values are Up and Down.
Admin Status	Configured status of the interface. Values are Up and Down (administratively configured down).
Channels in use on this port	Number of active channels used by this interface.
LineType	Framing used on the interface specified with the **ces dsx1 framing** interface command. Values (for T1) are ESF and SF; (for E1) E1-CRC-MFCASLT, E1-CRC-MFLT, E1-LT, and E1-MFCASLT.
LineCoding	Line coding used on the interface specified with the **ces dsx1 linecode** interface command. Values (for T1) are AMI and B8ZS; (for E1) HDB3.
LoopConfig	Indicates whether the interface in in a loop state specified by the **ces dsx1 loopback** interface command. Values are line loopback, payload loopback, and noloop.
SignalMode	For T1 to use robbed-bit signaling or not.
XmitClockSrc	Transmit clock source specified by the **ces dsx1 clock** interface command. Values are loop-timed or network-derived.
DataFormat	Type of CES services specified by the **ces aal1 service** interface command. Values are structured or unstructured.
AAL1 Clocking Mode	AAL1 clocking mode used by the interface specified with the **ces aal1 clock** interface command. Values are adaptive, synchronous residual time stamp (SRTS), or synchronous.
LineLength	Cable length specified by the **ces dsx1 lbo** interface command. Values are 0-110, 10-200, 220-330, 330-440, 440-550, 550-660, 660-above, and square-pulse.

Field	Description
LineState	Current status of the line. Values are: • Unknown • NoAlarm • RcvFarEndLOF • XmtFarEndLOF • RcvAIS • XmtAIS • LossOfFrame • LossOfSignal • LoopbackState • T16AIS
Errors in the Current Interval	Error statistics received during the current 15-minute interval.
PCVs	Number of Path Code Violations (PCVs). PCVs indicate a frame synchronization bit error in the D4 and E1 no-CRC formats, or a CRC error in the ESF and E1 CRC formats.
LCVs	Number of Line Code Violations (LCVs). LCVs indicate the occurrence of either a Bipolar Violation (BPV) or Excessive Zeros (EXZ) error event.
ESs	Number of errored seconds. In ESF and E1 CRC links, an Errored Second is a second in which one of the following are detected: one or more Path Code Violations, one or more Out of Frame defects, one or more Controlled Slip events, or a detected AIS defect. For SF and E1 no-CRC links, the presence of Bipolar Violations also triggers an Errored Second.
SESs	Number of Severely Errored Seconds (SESs). A SESs is a second with 320 or more path code violation errors events, one or more Out of Frame defects, or a detected AIS defect.
SEFSs	Number of Severely Errored Framing Seconds (SEFS). SEFS is a second with one or more Out of Frame defects or a detected incoming AIS.

Field	Description
UASs	Number of Unavailable Seconds (UASs). UAS is a count of the total number of seconds on the interface.
CSSs	Number of Controlled Slip Second (CSS). CSS is a 1-second interval containing one or more controlled slips.
LESs	Number of Line Errored Seconds (LES). LES is a second in which one or more Line Code Violation errors are detected.
BESs	Number of Bursty Errored Seconds (BES). BES is a second with fewer than 320 and more than one Path Coding Violation error, no Severely Errored Frame defects, and no detected incoming AIS defects. Controlled slips are not included in this parameter.
DMs	Number of Degraded Minutes (DMs). A degraded minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3. For more information, refer to RFC 1406.
Errors in the last 24Hrs	Error statistics received during the during the last 24 hours.
Input Counters	Number of cells and bytes received on the interface.
Output Counters	Number of cells and bytes.

Related Commands

Command	Description
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

show ces status

To display the status of the ports on the ATM-CES port adapter, use the **show ces status** command in privileged EXEC mode.

show ces status

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.

Examples

The following is sample output from the **show ces status**command. This output shows the interface name, the status of the interface, the administrative status of the interface, the port type, and the number of channels in use on the interface. The status of the interface can be UP (in operation) or DOWN (not in operation).

```
Router# show ces status

Interface          IF      Admin         Port   Channels in
  Name           Status   Status         Type       use
-------------- -------- --------- ------------ -----------
     CBR0/0/0       UP        UP           T1        1-24
     CBR0/0/1       UP        UP           T1        1-24
     CBR0/0/2       UP        UP           T1        1-24
     CBR0/0/3       UP        UP           T1
```

Related Commands

Command	Description
show ces circuit	Displays detailed circuit information for the CBR interface.

show controllers atm

To display information about an inverse multiplexing over ATM (IMA) group, use the **show controllers atm**privileged EXEC command.

Cisco 2600 and 3600 Series

show controllers atm [*slot* /**ima** *group-number*]

Cisco 7200 Series

show controller atm [*slot/port*]

or

show controllers atm [*slot*/ **ima** *group-number*]

Cisco 7500 Series (physical port hardware information)

show controllers atm [*slot/port-adapter/port*]

Cisco 7500 Series (IMA group hardware information)

show controllers atm [*slot/port-adapter* **ima** *group-number*]

Syntax Description

slot /	(Optional) ATM slot number.
ima	(Optional) This keyword indicates an IMA group specification rather than a port value for a UNI interface.
group-number	(Optional) Enter an IMA group number from 0 to 3. If you specify the group number, do not insert a space between **ima** and the number.
port	(Optional) ATM port number.
port-adapter /	(Optional) ATM port adapter.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2 GS	This command was introduced.
12.0(5)XK	This command was modified to support IMA groups on Cisco 2600 and 3600 series routers.

Release	Modification
12.0(5)T	This command was modified to support IMA groups on Cisco 2600 and 3600 series routers.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100,7200, and 7500 series routers 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

Use this command to monitor and diagnose ATM IMA links and groups.

Examples

Examples

On Cisco 7100 series or 7200 series routers, the following example displays detailed information about IMA group hardware related information. It includes the configuration of IMA hardware and IMA alarms.

```
Router# show controllers atm 1/ima0
Interface ATM1/ima0 is up
Hardware is IMA PA - DS1 (1Mbps)
Framer is PMC PM7344, SAR is LSI ATMIZER II
Firmware rev:G102, ATMIZER II rev:3
  idb=0x61DE9F10, ds=0x6185C0A0, vc=0x6187D3C0, pa=0x6184AF40
  slot 1, unit 9, subunit 0, fci_type 0x00BA, ticks 701720
  400 rx buffers:size=512, encap=64, trailer=28, magic=4
Curr Stats:
  rx_cell_lost=0, rx_no_buffer=0, rx_crc_10=0
  rx_cell_len=0, rx_no_vcd=0, rx_cell_throttle=0, tx_aci_err=0
Rx Free Ring status:
  base=0x3CFF0040, size=1024, write=320
Rx Compl Ring status:
  base=0x338DCE40, size=2048, read=1275
Tx Ring status:
  base=0x3CFE8040, size=8192, write=700
Tx Compl Ring status:
  base=0x338E0E80, size=2048, read=344
BFD Cache status:
  base=0x61878340, size=5120, read=5107
Rx Cache status:
  base=0x61863D80, size=16, write=11
Tx Shadow status:
  base=0x618641C0, size=8192, read=687, write=700
Control data:
  rx_max_spins=12, max_tx_count=25, tx_count=13
  rx_threshold=267, rx_count=11, tx_threshold=3840
  tx bfd write indx=0x27, rx_pool_info=0x61863E20
Control data base address:
       rx_buf_base = 0x038A15A0        rx_p_base = 0x6185CB40
            rx_pak = 0x61863AF0              cmd = 0x6185C320
       device_base = 0x3C800000     ima_pa_stats = 0x038E2FA0
        sdram_base = 0x3CE00000       pa_cmd_buf = 0x3CFFFC00
```

```
       vcd_base[0] = 0x3CE3C100      vcd_base[1] = 0x3CE1C000
         chip_dump = 0x038E3D7C       dpram_base = 0x3CD80000
   sar_buf_base[0] = 0x3CE4C000  sar_buf_base[1] = 0x3CF22000
       bfd_base[0] = 0x3CFD4000      bfd_base[1] = 0x3CFC0000
       acd_base[0] = 0x3CE88360      acd_base[1] = 0x3CE5C200
     pci_atm_stats = 0x038E2EC0
ATM1/ima0 is up
        hwgrp number = 1
grp tx up reg= 0x5, grp rx up reg= 0x3, rx dcb reg= 0xD4 0x4, tx links grp reg=
0x3, scci reg= 0x3C, ima id reg= 0x0, group status  reg= 0xA2, tx timing reg= 0x
20, tx test reg= 0x21, tx test pattern reg= 0x41, rx test pattern reg= 0x42, icp
 cell link info  reg= 0xFC, icp cell link info  reg= 0xFC, icp cell link info  r
eg= 0x0, icp cell link info  reg= 0x0, icp cell link info  reg= 0x0, icp cell li
nk info  reg= 0x0, icp cell link info  reg= 0x0, icp cell link info  reg= 0x0
```

Examples

On a Cisco 2600 or 3600 series router, the following example displays detailed information about IMA group 0 on ATM interface 2:

```
router# show controller atm 0/ima3
Interface ATM0/IMA3 is up
  Hardware is ATM IMA
LANE client MAC address is 0050.0f0c.148b
  hwidb=0x61C2E990, ds=0x617D498C
  slot 0, unit 3, subunit 3
  rs8234 base 0x3C000000, slave base 0x3C000000
  rs8234 ds 0x617D498C
  SBDs - avail 2048, guaranteed 3, unguaranteed 2045, starved 0
 Seg VCC table 3C00B800, Shadow Seg VCC Table 617EF76C, VCD Table 61805798
 Schedule table 3C016800, Shadow Schedule table 618087C4, Size 63D
 RSM VCC Table 3C02ED80, Shadow RSM VCC Table 6180C994
 VPI Index Table 3C02C300, VCI Index Table 3C02E980
 Bucket2 Table 3C01E500, Shadow Bucket2 Table 6180A0E4
 MCR Limit Table 3C01E900, Shadow MCR Table 617D2160
 ABR template 3C01EB00, Shadow template 614DEEAC
 RM Cell RS Queue 3C02C980
 Queue           TXQ Addr  Pos  StQ Addr  Pos
 0  UBR CHN0     3C028B00  0    03118540  0
 1  UBR CHN1     3C028F00  0    03118D40  0
 2  UBR CHN2     3C029300  0    03119540  0
 3  UBR CHN3     3C029700  0    03119D40  0
 4  VBR/ABR CHN0 3C029B00  0    0311A540  0
 5  VBR/ABR CHN1 3C029F00  0    0311AD40  0
 6  VBR/ABR CHN2 3C02A300  0    0311B540  0
 7  VBR/ABR CHN3 3C02A700  0    0311BD40  0
 8  VBR-RT CHN0  3C02AB00  0    0311C540  0
 9  VBR-RT CHN1  3C02AF00  0    0311CD40  0
 10 VBR-RT CHN2  3C02B300  0    0311D540  0
 11 VBR-RT CHN3  3C02B700  0    0311DD40  0
 12 SIG          3C02BB00  0    0311E540  0
 13 VPD          3C02BF00  0    0311ED40  0

 Queue           FBQ Addr  Pos  RSQ Addr  Pos
 0  OAM          3C0EED80  255  0311F600  0
 1  UBR CHN0     3C0EFD80  0    03120600  0
 2  UBR CHN1     3C0F0D80  0    03121600  0
 3  UBR CHN2     3C0F1D80  0    03122600  0
 4  UBR CHN3     3C0F2D80  0    03123600  0
 5  VBR/ABR CHN0 3C0F3D80  0    03124600  0
 6  VBR/ABR CHN1 3C0F4D80  0    03125600  0
 7  VBR/ABR CHN2 3C0F5D80  0    03126600  0
 8  VBR/ABR CHN3 3C0F6D80  0    03127600  0
 9  VBR-RT CHN0  3C0F7D80  0    03128600  0
 10 VBR-RT CHN1  3C0F8D80  255  03129600  0
 11 VBR-RT CHN2  3C0F9D80  0    0312A600  0
 12 VBR-RT CHN3  3C0FAD80  0    0312B600  0
 13 SIG          3C0FBD80  255  0312C600  0
SAR Scheduling channels:  -1 -1 -1 -1 -1 -1 -1 -1
ATM channel number is 1
link members are 0x7, active links are 0x0
Group status is blockedNe, 3 links configured,
```

```
Group Info: Configured links bitmap 0x7, Active links bitmap 0x0,
    Tx/Rx IMA_id 0x3/0x63,
    NE Group status is startUp,
    frame length 0x80, Max Diff Delay 0,
    1 min links, clock mode ctc, symmetry symmetricOperation, trl 0,
    Group Failure status is startUpNe.
    Test pattern procedure is disabled
SAR counter totals across all links and groups:
   0 cells output, 0 cells stripped
   0 cells input, 0 cells discarded, 0 AAL5 frames discarded
   0 pci bus err, 0 dma fifo full err, 0 rsm parity err
   0 rsm syn err, 0 rsm/seg q full err, 0 rsm overflow err
   0 hs q full err, 0 no free buff q err, 0 seg underflow err
   0 host seg stat q full err
```

Related Commands

Command	Description
show controllers atm	Displays information about an IMA group.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

show dxi map

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

show dxi map

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
10.3	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 dxi map** command. It displays output for several previously defined ATM-DXI maps that defined Apollo, IP, DECnet, CLNS, and AppleTalk protocol addresses, various encapsulations, and broadcast traffic.

```
Router# show dxi map

Serial0 (administratively down): ipx 123.0000.1234.1234
   DFA 69(0x45,0x1050), static, vpi = 4, vci = 5,
   encapsulation: SNAP
Serial0 (administratively down): appletalk 2000.5
   DFA 52(0x34,0xC40), static, vpi = 3, vci = 4,
   encapsulation: NLPID
Serial0 (administratively down): ip 172.21.177.1
   DFA 35(0x23,0x830), static,
   broadcast, vpi = 2, vci = 3,
   encapsulation: VC based MUX,
   Linktype IP
```

The table below explains significant fields shown in the display.

Table 16: show dxi map Field Descriptions

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

show dxi pvc

To display the permanent virtual circuit (PVC) statistics for a serial interface, use the **show dxi pvc** EXEC command.

show dxi pvc

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
10.3	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 dxi pvc** command. It displays output for ATM-DXI PVCs previously defined for serial interface 0.

```
Router# show dxi pvc
PVC Statistics for interface Serial0 (ATM DXI)
DFA = 17, VPI = 1, VCI = 1, PVC STATUS = STATIC, INTERFACE = Serial0
  input pkts 0             output pkts 0            in bytes 0
  out bytes 0              dropped pkts 0

DFA = 34, VPI = 2, VCI = 2, PVC STATUS = STATIC, INTERFACE = Serial0
  input pkts 0             output pkts 0            in bytes 0
  out bytes 0              dropped pkts 0

DFA = 35, VPI = 2, VCI = 3, PVC STATUS = STATIC, INTERFACE = Serial0
  input pkts 0             output pkts 0            in bytes 0
  out bytes 0              dropped pkts 0
```

The table below describes significant fields shown in the display.

Table 17: show dxi pvc Field Descriptions

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

show dxi pvc interface

To display the ATM Data Exchange Interface (DXI) Protocol Version Independent (PVI) interface information, use the **show dxi pvc interface**command in user EXEC or privileged EXEC mode.

show dxi pvc interface {*interface-type interface-number* [*vpi-number vci-number*]| *vpi-number vci-number*}

Syntax Description

interface-type	Specifies the interface type.
interface-number	Specifies the interface number.
vpi-number	Specifies the virtual path identifier number.
vci-number	Specifies the virtual circuit interface number.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRB	This command was introduced.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
12.4(22)T	This command was integrated into Cisco IOS Release 12.4(22)T.
Cisco IOS XE 2.3	This command was integrated into Cisco IOS XE Release 2.3.

Usage Guidelines

Use this command to display ATM DXI PVI interface information using the available keywords and arguments. More than one interface type and interface number can be specified. The **interface** keyword with the interface type and interface number can be specified again optionally after the first instance of the **interface** keyword, interface type and interface number.

Examples

The following is sample output from the **show dxi pvc interface**command. The fields are self-explanatory.

```
Router# show dxi pvc interface serial 2/0
PVC Statistics for interface Serial2/0 (ATM DXI)
DFA = 170, VPI = 10, VCI = 10, PVC STATUS = STATIC, INTERFACE = Serial2/0
input pkts 5 output pkts 5 in bytes 510
out bytes 510 dropped pkts 0
```

show ima interface atm

To display information about all configured inverse multiplexing over ATM (IMA) groups or a specific group, use the **show ima interface atm** command in privileged EXEC mode.

Cisco 2600 and 3600 Series

show ima interface atm [*slot* /**ima** *group-number*] **[detail]**

Cisco 7200 Series

show ima interface atm [*slot/port*] **[detail]**

or

show ima interface atm [*slot/port-adapter* **ima** *group-number*] **[detail]**

Cisco 7500 Series

show ima interface atm [*slot/port-adapterslot*] **[detail]**

or

show ima interface atm [*slot/port-adapter* **ima** *group-number*] **[detail]**

Cisco 7600 Series

show ima interface atm [*slot/subslot* **ima** *group-number*] **[detail]**

Syntax Description

slot /	(Optional) ATM slot number.
ima	(Optional) This keyword indicates an IMA group specification rather than a port value for a UNI interface.
group-number	(Optional) Enter an IMA group number from 0 to 3. If you specify the group number, do not insert a space between **ima** and the number. For Cisco 7600 series routers, the value of *group-number* is as follows: • 0 to 11 (24-port Channelized T1/E1 CEoP ATM SPA) • 0 to 41 (1-port Channelized OC3/STM-1 CEoP ATM SPA)
port	(Optional) ATM port number.
port-adapter /	(Optional) ATM port adapter.

subslot /	(Optional) SIP subslot where CEoP ATM SPA is installed.
detail	(Optional) To obtain detailed information, use this keyword.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(5)XK	This command was introduced.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated in Cisco IOS Release 12.1(5)T.
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)SRB2	Support for Cisco 7600 series routers was added for the 24-Port Channelized ATM CEoP SPA and 1-Port Channelized OC-3/STM-1 ATM CEoP SPA.

Usage Guidelines

Use this command to monitor the status of IMA group links.

Examples

Examples

The following example displays detailed information about IMA group 0 on ATM interface 2. If you do not enter the **detail** keyword, you do not see the IMA MIB information or the "Detailed Link Information" output.

```
Router# show ima interface atm 5/ima0 detail
ATM5/ima0 is up
        ImaGroupState:NearEnd = operational, FarEnd = operational
        ImaGroupFailureStatus  = noFailure
IMA Group Current Configuration:
        ImaGroupMinNumTxLinks = 2    ImaGroupMinNumRxLinks = 2
        ImaGroupDiffDelayMax  = 250  ImaGroupNeTxClkMode   = common(ctc)
        ImaGroupFrameLength   = 128  ImaTestProcStatus     = disabled
        ImaGroupTestLink      = 0    ImaGroupTestPattern   = 0xFF
IMA MIB Information:
        ImaGroupSymmetry        = symmetricOperation
        ImaGroupFeTxClkMode     = common(ctc)
        ImaGroupRxFrameLength   = 128
```

```
        ImaGroupTxTimingRefLink = 0     ImaGroupRxTimingRefLink = 0
        ImaGroupTxImaId         = 0     ImaGroupRxImaId         = 0
        ImaGroupNumTxCfgLinks   = 2     ImaGroupNumRxCfgLinks   = 2
        ImaGroupNumTxActLinks   = 2     ImaGroupNumRxActLinks   = 2
        ImaGroupLeastDelayLink  = 0     ImaGroupDiffDelayMaxObs = 0
IMA group counters:
        ImaGroupNeNumFailures   = 1     ImaGroupFeNumFailures   = 2
        ImaGroupUnAvailSecs     = 18    ImaGroupRunningSecs     = 241
IMA Detailed Link Information:
ATM5/0 is up
        ImaLinkRowStatus = active
        ImaLinkIfIndex   = 1            ImaLinkGroupIndex = 47
        ImaLinkState:
                NeTx = active
                NeRx = active
                FeTx = active
                FeRx = active
        ImaLinkFailureStatus:
                NeRx = noFailure
                FeRx = noFailure
        ImaLinkTxLid           = 0      ImaLinkRxLid           = 0
        ImaLinkRxTestPattern   = 64     ImaLinkTestProcStatus  = disabled
        ImaLinkRelDelay        = 0
IMA Link counters :
        ImaLinkImaViolations   = 1
        ImaLinkNeSevErroredSec = 10     ImaLinkFeSevErroredSec = 10
        ImaLinkNeUnavailSec    = 7      ImaLinkFeUnAvailSec    = 8
        ImaLinkNeTxUnusableSec = 17     ImaLinkNeRxUnUsableSec = 16
        ImaLinkFeTxUnusableSec = 17     ImaLinkFeRxUnusableSec = 16
        ImaLinkNeTxNumFailures = 0      ImaLinkNeRxNumFailures = 2
        ImaLinkFeTxNumFailures = 1      ImaLinkFeRxNumFailures = 1
ATM5/1 is up
        ImaLinkRowStatus = active
        ImaLinkIfIndex   = 2            ImaLinkGroupIndex = 47
        ImaLinkState:
                NeTx = active
                NeRx = active
                FeTx = active
                FeRx = active
        ImaLinkFailureStatus:
                NeRx = noFailure
                FeRx = noFailure
        ImaLinkTxLid           = 1      ImaLinkRxLid           = 1
        ImaLinkRxTestPattern   = 64     ImaLinkTestProcStatus  = disabled
        ImaLinkRelDelay        = 0
IMA Link counters :
        ImaLinkImaViolations   = 1
        ImaLinkNeSevErroredSec = 10     ImaLinkFeSevErroredSec = 10
        ImaLinkNeUnavailSec    = 7      ImaLinkFeUnAvailSec    = 8
        ImaLinkNeTxUnusableSec = 16     ImaLinkNeRxUnUsableSec = 16
        ImaLinkFeTxUnusableSec = 16     ImaLinkFeRxUnusableSec = 16
        ImaLinkNeTxNumFailures = 0      ImaLinkNeRxNumFailures = 2
        ImaLinkFeTxNumFailures = 1      ImaLinkFeRxNumFailures = 1
```

Examples

The following example displays information for IMA group 1 on the SPA in chassis slot 5, SIP subslot 0:

```
Router# show ima interface atm5/0/ima1

ATM5/0/ima1 is up, ACTIVATION COMPLETE
Slot 5 Slot Unit 0 unit 257, CTRL VC 257, Vir 0, VC -1
IMA Configured BW 12186, Active BW 3046
IMA version 1.0, Frame length 128
Link Test: Disabled
Auto-Restart: Disabled
        ImaGroupState: NearEnd = operational, FarEnd = operational
        ImaGroupFailureStatus = noFailure
IMA Group Current Configuration:
        ImaGroupMinNumTxLinks = 1    ImaGroupMinNumRxLinks = 1
        ImaGroupDiffDelayMax  = 25   ImaGroupNeTxClkMode   = common(ctc)
        ImaGroupFrameLength   = 128  ImaTestProcStatus     = disabled
```

```
        ImaGroupTestLink      = None ImaGroupTestPattern   = 0x0
        ImaGroupConfLink      = 8    ImaGroupActiveLink    = 2
IMA Link Information:
 ID       Link               Link Status                  Test Status
---- -------------- ------------------------------ ---------------
0    T1 5/0/0       Up   - controller Up           disabled
1    T1 5/0/1       Up   - controller Up           disabled
2    T1 5/0/2       Down - controller Up           disabled
3    T1 5/0/3       Down - controller Up           disabled
4    T1 5/0/4       Down - controller Up           disabled
5    T1 5/0/5       Down - controller Up           disabled
6    T1 5/0/6       Down - controller Up           disabled
7    T1 5/0/7       Down - controller Up           disabled
```

Examples

The following example displays detailed information about IMA group 0 on ATM interface 2. Without the **detail** keyword, only the information up to "Detailed group Information" appears.

```
Router# show ima interface atm 4/ima0 detail
Interface ATM2/IMA2 is up
        Group index is 2
        Ne state is operational, failure status is noFailure
        active links bitmap 0x30
    IMA Group Current Configuration:
        Tx/Rx configured links bitmap 0x30/0x30
        Tx/Rx minimum required links 1/1
        Maximum allowed diff delay is 25ms, Tx frame length 128
        Ne Tx clock mode CTC, configured timing reference link ATM2/4
        Test pattern procedure is disabled
    Detailed group Information:
        Tx/Rx Ima_id 0x22/0x40, symmetry symmetricOperation
        Number of Tx/Rx configured links 2/2
        Number of Tx/Rx active links 2/2
        Fe Tx clock mode ctc, Rx frame length 128
        Tx/Rx timing reference link 4/4
        Maximum observed diff delay 0ms, least delayed link 5
        Running seconds 32
        GTSM last changed 10:14:41 UTC Wed Jun 16 1999
    IMA Group Current Counters (time elapsed 33 seconds):
        3 Ne Failures, 3 Fe Failures, 4 Unavail Secs
    IMA Group Total Counters (last 0 15 minute intervals):
        0 Ne Failures, 0 Fe Failures, 0 Unavail Secs
    Detailed IMA link Information:

Interface ATM2/4 is up
        ifIndex 13, Group Index 2, Row Status is active
        Tx/Rx Lid 4/4, relative delay 0ms
        Ne Tx/Rx state active/active
        Fe Tx/Rx state active/active
        Ne Rx failure status is noFailure
        Fe Rx failure status is noFailure
        Rx test pattern 0x41, test procedure disabled
    IMA Link Current Counters (time elapsed 35 seconds):
        1 Ima Violations, 0 Oif Anomalies
        1 Ne Severely Err Secs, 2 Fe Severely Err Secs
        0 Ne Unavail Secs, 0 Fe Unavail Secs
        2 Ne Tx Unusable Secs, 2 Ne Rx Unusable Secs
        0 Fe Tx Unusable Secs, 2 Fe Rx Unusable Secs
        0 Ne Tx Failures, 0 Ne Rx Failures
        0 Fe Tx Failures, 0 Fe Rx Failures
    IMA Link Total Counters (last 0 15 minute intervals):
        0 Ima Violations, 0 Oif Anomalies
        0 Ne Severely Err Secs, 0 Fe Severely Err Secs
        0 Ne Unavail Secs, 0 Fe Unavail Secs
        0 Ne Tx Unusable Secs, 0 Ne Rx Unusable Secs
        0 Fe Tx Unusable Secs, 0 Fe Rx Unusable Secs
        0 Ne Tx Failures, 0 Ne Rx Failures
        0 Fe Tx Failures, 0 Fe Rx Failures

Interface ATM2/5 is up
        ifIndex 14, Group Index 2, Row Status is active
```

```
    Tx/Rx Lid 5/5, relative delay 0ms
    Ne Tx/Rx state active/active
    Fe Tx/Rx state active/active
    Ne Rx failure status is noFailure
    Fe Rx failure status is noFailure
    Rx test pattern 0x41, test procedure disabled
IMA Link Current Counters (time elapsed 46 seconds):
    1 Ima Violations, 0 Oif Anomalies
    1 Ne Severely Err Secs, 2 Fe Severely Err Secs
    0 Ne Unavail Secs, 0 Fe Unavail Secs
    2 Ne Tx Unusable Secs, 2 Ne Rx Unusable Secs
    0 Fe Tx Unusable Secs, 2 Fe Rx Unusable Secs
    0 Ne Tx Failures, 0 Ne Rx Failures
    0 Fe Tx Failures, 0 Fe Rx Failures
IMA Link Total Counters (last 0 15 minute intervals):
    0 Ima Violations, 0 Oif Anomalies
    0 Ne Severely Err Secs, 0 Fe Severely Err Secs
    0 Ne Unavail Secs, 0 Fe Unavail Secs
    0 Ne Tx Unusable Secs, 0 Ne Rx Unusable Secs
    0 Fe Tx Unusable Secs, 0 Fe Rx Unusable Secs
    0 Ne Tx Failures, 0 Ne Rx Failures
    0 Fe Tx Failures, 0 Fe Rx Failures
```

Related Commands

Command	Description
show controllers atm	Displays information about an IMA group.

show interface cbr

To display information about the constant bit rate (CBR) interface on the ATM-CES port adapter, use the **show interface cbr** command in privileged EXEC mode.

show interface cbr *slot/port*

Syntax Description

slot/port	Interface slot and port.

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.

Examples

The following is sample output from the **show interface cbr**command.

```
Router# show interface cbr 6/0
CBR6/0 is up, line protocol is up
  Hardware is DCU
  MTU 0 bytes, BW 1544 Kbit, DLY 0 usec, rely 255/255, load 248/255
  Encapsulation ET_ATMCES_T1, loopback not set
  Last input 00:00:00, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/0, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 1507000 bits/sec, 3957 packets/sec
  5 minute output rate 1507000 bits/sec, 3955 packets/sec
     3025960 packets input, 142220120 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     3030067 packets output, 142413149 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the fields shown in the display.

Table 18: show interface cbr Field Descriptions

Field	Description
CBR6/0 is...	Type, slot, and port number of the interface and indicates whether the interface hardware is currently active (whether carrier detect is present), down, or if it has been taken down by an administrator.
line protocol is...	Indicates whether the software processes that handle the line protocol think the line is usable (that is, whether keepalives are successful). Values are up, down, and administratively down.
Hardware is...	Hardware type.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100% reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to interface.
loopback not set	Indicates whether or not loopback is set.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface failed.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing	The time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates that the elapsed time is too large to be displayed. 0:00:00 indicates that the counters were cleared more than 231ms (and less than 232ms) ago.
Queueing strategy	First-in, first-out queuing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum may not balance with the other counts.

Field	Description
CRC	Cyclic redundancy checksum generated by the originating LAN station or far end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on the interface. This usually indicates a clocking problem between the interface and the data link equipment.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Because collisions do not occur on CBR interfaces, this statistic is always zero.

Field	Description
interface resets	Number of times an interface has been reset. The interface may be reset by the administrator or automatically when an internal error occurs.
output buffer failures	Number of no resource errors received on the output.
output buffers swapped out	Number of packets swapped to DRAM.

Related Commands

Command	Description
show ces interface cbr	Displays detailed CBR port information.

show interfaces atm

To display information about the ATM interface, use the **show interfaces atm** command in privileged EXEC mode.

Cisco 7500 Series Routers with AIP; Cisco 7200 Series Routers with ATM, ATM-CES, and Enhanced ATM Port Adapter; Cisco 2600 and 3600 Series Routers with 1-port ATM-25 Network Module

show interfaces atm[*slot* / *port*]

Cisco 7500 Series Routers with the ATM Port Adapter and Enhanced ATM Port Adapter

show interfaces atm[*slot* /*port-adapter* / *port*]

Cisco ASR 1000 Series Aggregation Services Routers

show interfaces atm[*slot* / *port*] *port*

Syntax Description

slot/*port*	(Optional) ATM slot number and port number. Use this format for the following platform configurations: • The Accountable Internet Protocol (AIP) on Cisco 7500 series routers. • The ATM port adapter, ATM Circuit Emulation Service (CES) port adapter, or enhanced ATM port adapter on Cisco 7200 series routers. • The 1-port ATM-25 network module on Cisco 2600 and 3600 series routers.
slot/*port-adapter*/*port*	(Optional) ATM slot, port adapter, and port numbers. Use this format for the ATM port adapter or enhanced ATM port adapter on Cisco 7500 series routers.

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.

Release	Modification
Cisco IOS XE Release 3.1S	This command was modified on the Cisco ASR 1000 Series Aggregation Services Routers. The counter for overrun includes the number of over subscription drop packets, and the counter for input errors also includes the number of errored packets.
Cisco IOS XE Release 3.9S	This command was modified on the Cisco ASR 1000 Series Aggregation Services Routers. The output of the **show interfaces atm** command was modified to include counter information for input errors and input overruns with ingress over subdrops.

Examples

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

```
Device# show interfaces atm 4/0

ATM4/0 is up, line protocol is up
 Hardware is cxBus ATM
 Internet address is 10.108.97.165, subnet mask is 255.255.255.0
 MTU 4470 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load ½55
 ATM E164 Auto Conversion Interface
 Encapsulation ATM, loopback not set, keepalive set (10 sec)
 Encapsulation(s): AAL5, PVC mode
 256 TX buffers, 256 RX buffers, 1024 Maximum VCs, 1 Current VCs
 Signalling vc = 1, vpi = 0, vci = 5
 ATM NSAP address: BC.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.13
 Last input 0:00:05, output 0:00:05, output hang never
 Last clearing of "show interface" counters never
 Output queue 0/40, 0 drops; input queue 0/75, 0 drops
 Five minute input rate 0 bits/sec, 0 packets/sec
 Five minute output rate 0 bits/sec, 0 packets/sec
     144 packets input, 3148 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     154 packets output, 4228 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets, 0 restarts
```

The following is sample output from the **show interfaces atm** command for the ATM port adapter on a Cisco 7500 series router:

```
Device# show interfaces atm 0/0/0

ATM0/0/0 is up, line protocol is up
 Hardware is cyBus ATM
 Internet address is 10.1.1.1/24
 MTU 4470 bytes, sub MTU 4470, BW 156250 Kbit, DLY 80 usec, rely 255/255, load 1/255
 Encapsulation ATM, loopback not set, keepalive set (10 sec)
 Encapsulation(s): AAL5, PVC mode
 256 TX buffers, 256 RX buffers,
 2048 maximum active VCs, 1024 VCs per VP, 1 current VCCs
 VC idle disconnect time: 300 seconds
 Last input never, output 00:00:05, output hang never
 Last clearing of "show interface" counters never
 Queueing strategy: fifo
 Output queue 0/40, 0 drops; input queue 0/75, 0 drops
 5 minute input rate 0 bits/sec, 1 packets/sec
 5 minute output rate 0 bits/sec, 1 packets/sec
     5 packets input, 560 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5 packets output, 560 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

The following is sample output from the **show interfaces atm** command for ATM interfaces with auto virtual circuit (VC) configured on a Cisco ASR 1000 series router:

Note The PPPoE Active Discovery Initiation (PADI) discard errors are visible only when an auto VC is configured on a Cisco ASR 1000 series router.

```
Device# show interfaces atm0/3/0

ATM0/2/0 is up, line protocol is up
  Hardware is SPA-3XOC3-ATM-V2, address is 0026.cb0c.e620 (bia 0026.cb0c.e620)
  MTU 4470 bytes, sub MTU 4470, BW 149760 Kbit/sec, DLY 80 usec,
     reliability 255/255, txload 14/255, rxload 18/255
  Encapsulation ATM, loopback not set
  Keepalive not supported
  Auto VC PADI drops 36180
  Encapsulation(s): AAL5 AAL0
  8191 maximum active VCs, 5001 current VCCs
  VC Auto Creation Enabled.
  VC idle disconnect time: 300 seconds
  0 carrier transitions
  Last input never, output 00:00:00, output hang never
  Last clearing of "show interface" counters 00:22:57
  Input queue: 0/375/18799881/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 10725000 bits/sec, 27944 packets/sec
  5 minute output rate 8265000 bits/sec, 14531 packets/sec
     38786080 packets input, 1861731840 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     20117198 packets output, 1448438256 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out
```

The following is sample output from the **show interfaces atm** command for the shared port adapter (SPA) on a Cisco ASR 1000 series router:

```
Device# show interfaces atm 1/2/0

ATM1/2/0 is up, line protocol is up
  Hardware is SPA-1XOC12-ATM-V2, address is 001a.3046.9460 (bia 001a.3046.9460)
  Description: Connected to AX4000 Port 1
  MTU 4470 bytes, sub MTU 4470, BW 599040 Kbit/sec, DLY 80 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ATM, loopback not set
  Keepalive not supported
  Encapsulation(s): AAL5 AAL0
  8191 maximum active VCs, 1 current VCCs
  VC Auto Creation Disabled.
  VC idle disconnect time: 300 seconds
  0 carrier transitions
  Last input never, output 1d08h, output hang never
  Last clearing of "show interface" counters 15:08:22
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  30 second input rate 105054000 bits/sec, 102593 packets/sec
  30 second output rate 104216000 bits/sec, 101773 packets/sec
     15735943 packets input, 2014200704 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     1628867 input errors, 0 CRC, 0 frame, 1628867 overrun, 0 ignored, 0 abort
     15735888 packets output, 2014193664 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the fields shown in the sample displays.

Table 19: show interfaces atm Field Descriptions

Field	Description
ATM... is {up | down | administratively down}	Indicates whether the interface hardware is currently active (whether carrier detect is present) and if it has been taken down by an administrator.
line protocol is {up | down | administratively down}	Indicates whether the line is usable in the software processes that handle the line protocol (that is, whether keepalives are successful).
Hardware is	Hardware type.
Internet address is	Internet address and subnet mask.
MTU	Maximum transmission unit of the interface.
sub MTU	Maximum transmission unit of the subinterface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100-percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
ATM E164 Auto Conversion Interface	Indicates that ATM E164 auto conversion is enabled. When this field is not present, ATM E164 auto conversion is disabled.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether the interface is configured for loopback testing.
keepalive	Indicates whether keepalives are set.
Auto VC PADI	PPPoE Active Discovery Initiation (PADI) discard errors are displayed as part of overrun section of the **show interface** command output; here, overrun is the sum of oversubscription counters and PADI discard errors.

Field	Description
Encapsulation(s)	Type of encapsulation used on the interface (for example, ATM Adaptation Layer 5 (AAL5,) and either permanent virtual circuit (PVC) or switched virtual circuits (SVC) mode.
TX buffers	Number of buffers configured with the **atm txbuff** command.
RX buffers	Number of buffers configured with the **atm rxbuff** command.
Maximum active VCs	Maximum number of virtual circuits.
VCs per VP	Number of virtual circuits per virtual path. The default is 1024.
Current VCs	Number of virtual circuit connections currently open.
VC idle disconnect time	Number of seconds the SVC must be idle before the SVC is disconnected.
Signalling vc	Number of the signaling PVC.
vpi	Virtual path identifier number.
vci	Virtual channel identifier number.
ATM NSAP address	Network Service Access Point (NSAP) address of the ATM interface.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface failed.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing	The time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates that the elapsed time is too large to be displayed. 0:00:00 indicates that the counters were cleared more than 231 ms (and less than 232 ms) ago.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
Received broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.

Field	Description
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, oversubscription, and abort counts. Other input-related errors can also increment the count, so that this sum may not balance with the other counts. **Note** On a Cisco ASR 1000 Series Aggregation Services Router, the input errors field also includes the number of oversubscription drop packets, autodiscovery drops, and unknown packets received in the ingress direction. The ingress over subdrops counter accounts for packets dropped when the ATM ports experience heavy line traffic.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data. It also includes the oversubscription drop counters. **Note** On a Cisco ASR 1000 Series Aggregation Services Router, the overrun field includes the number of oversubscription drop packets, autodiscovery drops, and unknown packets received in the ingress direction that are collected from the ATM shared port adapters (SPA) hardware.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.

Field	Description
abort	Illegal sequence of one bits on the interface. This usually indicates a clocking problem between the interface and the data link equipment.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	This feature is not applicable for ATM interfaces.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
output buffer failures	Number of times that a packet was not output from the output hold queue because of a shortage of MEMD shared memory.
output buffers swapped out	Number of packets stored in main memory when the output queue is full; swapping buffers to main memory prevents packets from being dropped when output is congested. The number is high when traffic is bursty.
restarts	Number of times the controller was restarted because of errors.

show lane

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

To display detailed information for all the LAN Emulation (LANE) components configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN (ELAN), use the **show lane** 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 [**interface atm** *slot/port* [. *subinterface-number*]| **name** *elan-name*] **[brief]**

ATM Port Adapter on the Cisco 7500 Series Routers

show lane [**interface atm** *slot/port-adapter/port* [. *subinterface-number*]| **name** *elan-name*] **[brief]**

Cisco 4500 and 4700 Routers

show lane [**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

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.
15.1M	This command was removed.

Usage Guidelines

Using the **show lane** command is equivalent to using the **show lane config**, **show lane server**, **show lane bus**, and **show lane client** commands. The **show lane** command shows all LANE-related information except the **show lane database** command information.

Examples

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

```
Router# show lane
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  <-------- me
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
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
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
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** command for a Token Ring LANE network:

```
Router# show lane
LE Config Server ATM4/0 config table: eng
Admin: up  State: operational
LECS Mastership State: active master
list of global LECS addresses (35 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
LE Server ATM4/0.1  ELAN name: elan1  Admin: up  State: operational
type: token ring         Max Frame Size: 4544      Segment ID: 2048
ATM address: 39.020304050607080910111213.006047704181.01
LECS used: 39.020304050607080910111213.006047704183.00 connected, vcd 9
control distribute: vcd 12, 1 members, 2 packets
proxy/ (ST: Init, Conn, Waiting, Adding, Joined, Operational, Reject, Term)
lecid ST vcd    pkts Hardware Addr  ATM Address
   1  O    8       3 100.2         39.020304050607080910111213.006047704180.01
                     0060.4770.4180 39.020304050607080910111213.006047704180.01
LE BUS ATM4/0.1  ELAN name: elan1  Admin: up  State: operational
type: token ring         Max Frame Size: 4544      Segment ID: 2048
ATM address: 39.020304050607080910111213.006047704182.01
data forward: vcd 16, 1 members, 0 packets, 0 unicasts
lecid  vcd     pkts   ATM Address
    1   13        0 39.020304050607080910111213.006047704180.01
LE Client ATM4/0.1  ELAN name: elan1  Admin: up  State: operational
Client ID: 1                LEC up for 2 hours 25 minutes 39 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 table below describes significant fields shown in the display.

Table 20: show lane Field Descriptions

Field	Description
LE Config Server	Identifies the following lines as applying to the LANE configuration server. These lines are also displayed in output from the **show lane config**command. See the **show lane config** command for explanations of the output.
LE Server	Identifies the following lines as applying to the LANE server. These lines are also displayed in output from the **show lane server**command. See the **show lane server** command for explanations of the output.

Field	Description
LE BUS	Identifies the following lines as applying to the LANE broadcast and unknown server. These lines are also displayed in output from the **show lane bus** command. See the **show lane bus** command for explanations of the output.
LE Client	Identifies the following lines as applying to a LANE client. These lines are also displayed in output from the **show lane client**command. See the **show lane bus** command for explanations of the output.