name local-seg-id

To specify or replace the ring number of the emulated LAN (ELAN) in the configuration server's configuration database, use the **name local-seg-id** command in database configuration mode. To remove the ring number from the database, use the **no** form of this command.

name *elan-name* **local-seg-id** *segment-number*

no name *elan-name* **local-seg-id** *segment-number*

Syntax Description

elan-name	Name of the ELAN. The maximum length of the name is 32 characters.
segment-number	Segment number to be assigned to the ELAN. The number ranges from 1 to 4095.

Defaults

No ELAN name or segment number is provided.

Command Modes

Database configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

This command is ordinarily used for Token Ring LANE.

The same LANE ring number cannot be assigned to more than one ELAN.

The **no** form of this command deletes the relationships.

Examples

The following example specifies a ring number of 1024 for the ELAN named red:

```
name red local-seg-id 1024
```

Related Commands

Command	Description
default-name	Provides an ELAN name in the database of the configuration server for those client MAC addresses and client ATM addresses that do not have explicit ELAN name bindings.
lane database	Creates a named configuration database that can be associated with a configuration server.
mac-address	Sets the MAC-layer address of the Cisco Token Ring.

name preempt

To set the emulated LAN (ELAN) preempt, use the **name preempt** command in LANE database configuration mode. To disable preemption, use the **no** form of this command.

name *elan-name* **preempt**

no name *elan-name* **preempt**

Syntax Description

elan-name	Specifies the name of the ELAN.

Defaults

Preemption is off by default.

Command Modes

LANE database configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

In prior releases, when the primary LES failed, the Cisco SSRP protocol switched over to a secondary LES. But when a LES that is ranked higher in the list came back up, the SSRP protocol switched the active LES to the new LES, which had a higher priority. This forced the network to flap multiple times. We have prevented the network flapping by staying with the currently active master LES regardless of the priority. If a higher priority LES comes back online, SSRP will not switch to that LES.

LES preemption is off by default. The first LES that comes on becomes the master. Users can revert to the old behavior (of switching to the higher-priority LES all the time) by specifying the **name** *elan-name* **preempt** command in the LECS database.

Examples

The following example sets the ELAN preempt for the ELAN named MYELAN:

```
name MYELAN preempt
```

name server-atm-address

To specify or replace the ATM address of the LANE server for the emulated LAN (ELAN) in the configuration server's configuration database, use the **name server-atm-address** command in database configuration mode. To remove it from the database, use the **no** form of this command.

name *elan-name* **server-atm-address** *atm-address* [**restricted** | **un-restricted**] [**index** *number*]

no name *elan-name* **server-atm-address** *atm-address* [**restricted** | **un-restricted**] [**index** *number*]

Syntax Description

elan-name	Name of the ELAN. Maximum length is 32 characters.
atm-address	LANE server's ATM address.
restricted | **un-restricted**	(Optional) Membership in the named ELAN is restricted to the LANE clients explicitly defined to the ELAN in the configuration server's database.
index *number*	(Optional) Priority number. When specifying multiple LANE servers for fault tolerance, you can specify a priority for each server. 0 is the highest priority.

Defaults

No emulated LAN name or server ATM address is provided.

Command Modes

Database configuration

Command History

Release	Modification
11.0	This command was introduced.
11.2	The following keywords were added: • **un-restricted** • **index**

Usage Guidelines

ELAN names must be unique within one named LANE configuration database.

Specifying an existing ELAN name with a new LANE server ATM address adds the LANE server ATM address for that ELAN for redundant server operation or simple LANE service replication. This command can be used multiple times.

The **no** form of this command deletes the relationships.

Examples

The following example configures the example3 database with two restricted and one unrestricted ELANs. The clients that can be assigned to the eng and mkt ELANs are specified using the **client-atm-address** commands. All other clients are assigned to the man ELAN.

```
lane database example3
 name eng server-atm-address 39.000001415555121101020304.0800.200c.1001.02 restricted
 name man server-atm-address 39.000001415555121101020304.0800.200c.1001.01
 name mkt server-atm-address 39.000001415555121101020304.0800.200c.4001.01 restricted
 client-atm-address 39.000001415555121101020304.0800.200c.1000.02 name eng
 client-atm-address 39.000000141555121101020304.0800.200c.2000.02 name eng
 client-atm-address 39.000001415555121101020304.0800.200c.3000.02 name mkt
 client-atm-address 39.000001415555121101020304.0800.200c.4000.01 name mkt
 default-name man
```

Related Commands

Command	Description
client-atm-address name	Adds a LANE client address entry to the configuration database of the configuration server.
default-name	Provides an ELAN name in the database of the configuration server for those client MAC addresses and client ATM addresses that do not have explicit ELAN name bindings.
lane database	Creates a named configuration database that can be associated with a configuration server.
mac-address	Sets the MAC-layer address of the Cisco Token Ring.

neighbor activate

To enable the exchange of information with a neighboring router, use the **neighbor activate** command in address family configuration or router configuration mode. To disable the exchange of an address with a neighboring router, use the **no** form of this command.

neighbor {*ip-address* | *peer-group-name*} **activate**

no neighbor {*ip-address* | *peer-group-name*} **activate**

Syntax Description

ip-address	IP address of the neighboring router.
peer-group-name	Name of BGP peer group.

Defaults

The exchange of addresses with neighbors is enabled by default for the IPv4 address family. You can disable IPv4 address exchange using the **no default bgp ipv4 activate** command, or you can disable it for a particular neighbor using the **no** form of the **neighbor activate** command.

For all other address families, address exchange is disabled by default. You can explicitly activate the default command using the appropriate address family configuration.

Command Modes

Address family configuration

Router configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

Use this command to enable or disable the exchange of addresses with a neighboring router.

Examples

The following example activates advertisement of NLRI for address family named VPN IPv4 for all neighbors in the BGP peer group named PEPEER and for the neighbor 144.0.0.44:

```
address-family vpnv4
neighbor PEPEER activate
neighbor 144.0.0.44 activate
exit-address-family
```

Related Commands

Command	Description
address-family	Enters the address family submode for configuring routing protocols, such as BGP, RIP, and static routing.
exit-address-family	Exits from the address family submode.

neighbor allowas-in

To configure PE routers to allow readvertisement of all prefixes containing duplicate ASNs, use the **neighbor allowas-in** command in router configuration mode. To disable the readvertisement of a PE router's ASN, use the **no** form of this command.

neighbor *ip-address* **allowas-in** [*number*]

no neighbor *ip-address* **allowas-in** [*number*]

Syntax Description

ip-address	IP address of the neighboring router.
number	(Optional) Specifies the number of times to allow the advertisement of a PE router's ASN. Valid values are from 1 to 10. Valid values are from 1 to 10. If no number is supplied, the default value of 3 times is used.

Defaults

No default behavior or values.

Command Modes

Router configuration

Command History

Release	Modification
12.0(7)T	This command was introduced.
12.1	This command was integrated into Cicso IOS Release 12.1.
12.2	This command was integrated into Cicso IOS Release 12.2.

Usage Guidelines

In a hub and spoke configuration, a PE router readvertises all prefixes containing duplicate autonomous system numbers. Use the **neighbor allowas-in** command to configure two VRFs on each PE router to receive and readvertise prefixes are as follows:

- One Virtual Private Network routing and forwarding (VRF) instance receives prefixes with ASNs from all PE routers and then advertises them to neighboring PE routers.

- The other VRF receives prefixes with ASNs from the CE router and readvertises them to all PE routers in the hub and spoke configuration.

You control the number of times an ASN is advertised by specifying a number from 1 to 10.

Examples

In the following example, the PE router with ASN 100 is configured to allow prefixes from the VRF address family VPN IPv4 vrf1. The neighboring PE router with the IP address 192.168.255.255 is set to be readvertised to other PE routers with the same ASN six times.

```
router bgp 100
 address-family ipv4 vrf vrf1
 neighbor 192.168.255.255 allowas-in 6
```

Related Commands

Command	Description
address-family	Enters the address family configuration submode used to configure routing protocols such as BGP, OSPF, RIP, and static routing.

neighbor as-override

To configure a PE router to override the ASN of a site with the ASN of a provider, use the **neighbor as-override** command in router configuration mode. To remove VPN IPv4 prefixes from a specified router, use the **no** form of this command.

neighbor *ip-address* **as-override**

no neighbor *ip-address* **as-override**

Syntax Description

ip-address	Specifies the IP address of the router that is to be overridden with the ASN provided.

Defaults

No default behavior or values.

Command Modes

Router configuration

Command History

Release	Modification
12.0(7)T	This command was introduced.

Usage Guidelines

This command is used in conjunction with the site-of-origin feature, identifying the site where a route originated, and preventing routing loops between routers within a VPN.

Examples

The following example shows how to configure a router to override the ASN of a site with the ASN of a provider:

```
router bgp 100
 neighbor 192.168.255.255 remote-as 109
 neighbor 192.168.255.255 update-source loopback0
 address-family ipv4 vrf vpn1
 neighbor 192.168.255.255 activate
 neighbor 192.168.255.255 as-override
```

Related Commands

Command	Description
neighbor activate	Enables the exchange of information with a BGP neighboring router.
neighbor remote-as	Allows a neighboring router's IP address to be included in the BGP routing table.
neighbor update-source	Allows internal BGP sessions to use any operational interface for TCP/IP connections.
route-map	Redistributes routes from one routing protocol to another.

network-id

To specify the network ID of an MPS, use the **network-id** command in MPS configuration mode. To revert to the default value (default value is 1), use the **no** form of this command.

network-id *id*

no network-*id*

Syntax Description	*id*	Specifies the network ID of the MPOA server.

Defaults

The default value for the network id is 1.

Command Modes

MPS configuration

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.

Usage Guidelines

Specifies the network ID of this MPS. This value is used in a very similar way the NHRP network ID is used. It is for partitioning NBMA clouds artificially by administration.

Examples

The following example sets the network ID to 5:

```
network-id 5
```

next-address

To specify the next IP address in the explicit path, use the **next-address** IP explicit path configuration command. To disable this feature, use the **no** form of this command.

next-address *A.B.C.D*

no next-address *A.B.C.D*

Syntax Description

A.B.C.D	Next IP address in the explicit path.

Defaults

No default behavior or values.

Command Modes

IP explicit path configuration

Command History

Release	Modification
12.0(5)S	This command was introduced.

Examples

In the following example, the number 60 is assigned to the IP explicit path, the path is enabled, and 3.3.27.3 is specified as the next IP address in the list of IP addresses:

```
Router(config)# ip explicit-path identifier 60 enable
Router(cfg-ip-expl-path)# next-address 3.3.27.3

Explicit Path identifier 60:
    1: next-address 3.3.27.3
Router(cfg-ip-exp1-path)#
```

Related Commands

Command	Description
append-after	Inserts the new path entry after the specified index number. Commands might be renumbered as a result.
index	Inserts or modifies a path entry at a specified index.
ip explicit-path	Enters the subcommand mode for IP explicit paths and creates or modifies the specified path.
list	Displays all or part of the explicit paths.
show ip explicit-paths	Displays configured IP explicit paths.

rate-limit

To configure CAR and DCAR policies, use the **rate-limit** interface configuration command. To remove the rate limit from the configuration, use the **no** form of this command.

> **rate-limit** {**input** | **output**} [**access-group** [**rate-limit**] *acl-index*] *bps*
> *burst-normal burst-max* **conform-action** *conform-action* **exceed-action** *exceed-action*

> **no rate-limit** {**input** | **output**}[**access-group** [**rate-limit**] *acl-index*] *bps*
> *burst-normal burst-max* **conform-action** *conform-action* **exceed-action** *exceed-action*

Syntax Description	
input	Applies this CAR traffic policy to packets received on this input interface.
output	Applies this CAR traffic policy to packets sent on this output interface.
access-group	(Optional) Applies this CAR traffic policy to the specified access list.
rate-limit	(Optional) The access list is a rate-limit access list.
acl-index	(Optional) Access list number.
bps	Average rate (in bits per second). The value must be in increments of 8 kbps.
burst-normal	Normal burst size (in bytes). The minimum value is bits per second divided by 2000.
burst-max	Excess burst size (in bytes).
conform-action *conform-action*	Action to take on packets that conform to the specified rate limit. Specify one of the following keywords: • **continue**—Evaluates the next **rate-limit** command. • **drop**—Drops the packet. • **set-dscp-continue**—Sets the differentiated services code point (DSCP) (0 to 63) and evaluate the next **rate-limit** command. • **set-dscp-transmit**—Sends the DSCP and transmit the packet. • **set-mpls-exp-continue**—Sets the MPLS experimental bits (0 to 7) and evaluates the next **rate-limit** command. • **set-mpls-exp-transmit**—Sets the MPLS experimental bits (0 to 7) and sends the packet. • **set-prec-continue**—Sets the IP precedence (0 to 7) and evaluates the next **rate-limit** command. • **set-prec-transmit**—Sets the IP precedence (0 to 7) and sends the packet. • **set-qos-continue**—Sets the QoS group ID (1 to 99) and evaluates the next **rate-limit** command. • **set-qos-transmit**—Sets the QoS group ID (1 to 99) and sends the packet. • **transmit**—Sends the packet.

exceed-action *exceed-action*	Action to take on packets that exceed the specified rate limit. Specify one of the following keywords:
	• **continue**—Evaluates the next **rate-limit** command.
	• **drop**—Drops the packet.
	• **set-dscp-continue**—Sets the DSCP (0 to 63) and evaluates the next **rate-limit** command.
	• **set-dscp-transmit**—Sends the DSCP and sends the packet.
	• **set-mpls-exp-continue**—Sets the MPLS experimental bits (0 to 7) and evaluates the next **rate-limit** command.
	• **set-mpls-exp-transmit**—Sets the MPLS experimental bits (0 to 7) and sends the packet.
	• **set-prec-continue**—Sets the IP precedence (0 to 7) and evaluates the next **rate-limit** command.
	• **set-prec-transmit**—Sets the IP precedence (0 to 7) and sends the packet.
	• **set-qos-continue**—Sets the QoS group ID (1 to 99) and evaluates the next **rate-limit** command.
	• **set-qos-transmit**—Sets the QoS group ID (1 to 99) and sends the packet.
	• **transmit**—Sends the packet.

Defaults CAR and DCAR are disabled.

Command Modes Interface configuration

Command History

Release	Modification
11.1 CC	This command was introduced.
12.1(5)T	The **conform** and **exceed** actions were added for the MPLS experimental field.

Usage Guidelines Use this command to configure your CAR policy on an interface. To specify multiple policies, enter this command once for each policy.

CAR and DCAR can be configured on an interface or subinterface.

Examples

In the following example, the rate is limited by application:

- All World Wide Web traffic is sent. However, the MPLS experimental field for web traffic that conforms to the first rate policy is set to 5. For nonconforming traffic, the IP precedence is set to 0 (best effort). See the following commands in the example:

```
rate-limit input rate-limit access-group 101 20000000 24000 32000 conform-action
set-mpls-exp-transmit 5 exceed-action set-mpls-exp-transmit 0

access-list 101 permit tcp any any eq www
```

- FTP traffic is sent with an MPLS experimental field of 5 if it conforms to the second rate policy. If the FTP traffic exceeds the rate policy, it is dropped. See the following commands in the example:

```
rate-limit input access-group 102 10000000 24000 32000
conform-action set-mpls-exp-transmit 5 exceed-action drop

access-list 102 permit tcp any any eq ftp
```

- Any remaining traffic is limited to 8 Mbps, with a normal burst size of 16,000 bytes and an excess burst size of 24000 bytes. Traffic that conforms is sent with an MPLS experimental field of 5. Traffic that does not conform is dropped. See the following command in the example:

```
rate-limit input 8000000 16000 24000 conform-action set-mpls-exp-transmit 5
exceed-action drop
```

Notice that two access lists are created to classify the web and FTP traffic so that they can be handled separately by the CAR feature:

```
router(config)# interface Hssi0/0/0
router(config-if)# description 45Mbps to R2
router(config-if)# rate-limit input rate-limit access-group 101 20000000 24000 32000
  conform-action set-mpls-exp-transmit 5 exceed-action set-mpls-exp-transmit 0
router(config-if)# rate-limit input access-group 102 10000000 24000 32000
  conform-action set-mpls-exp-transmit 5 exceed-action drop
router(config-if)# rate-limit input 8000000 16000 24000 conform-action
  set-mpls-exp-transmit 5 exceed-action drop
router(config-if)# ip address 200.200.14.250 255.255.255.252
!
router(config-if)# access-list 101 permit tcp any any eq www
router(config-if)# access-list 102 permit tcp any any eq ftp
```

In the following example, the MPLS experimental field is set and the packet is sent:

```
router(config)# interface FastEtheret1/1/0
router(config)# rate-limit input 8000 1000 1000 access-group conform-action
  set mpls-exp-transmit 5 exceed-action set-mpls-exp-transmit 5
```

Related Commands

Command	Description
access-list rate-limit	Configures an access list for use with CAR policies.
show access-list rate-limit	Displays information about rate-limit access lists.
show interfaces rate-limit	Displays information about CAR for a specified interface.

rd

To create routing and forwarding tables for a VRF, use the **rd** command in VRF configuration submode.

rd *route-distinguisher*

Syntax Description

route-distinguisher	Adds an 8-byte value to an IPv4 prefix to create a VPN IPv4 prefix.

Defaults

There is no default. A route distinguisher (RD) must be configured for a VRF to be functional.

Command Modes

VRF configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

A RD creates routing and forwarding tables and specifies the default route distinguisher for a VPN. The RD is added to the beginning of the customer's IPv4 prefixes to change them into globally unique VPN-IPv4 prefixes.

Either RD is an ASN-relative RD, in which case it is composed of an autonomous system number and an arbitrary number, or it is an IP-address-relative RD, in which case it is composed of an IP address and an arbitrary number.

You can enter an RD in either of these formats:

*16-bit AS number***:** *your 32-bit number*
For example, 101:3.

*32-bit IP address***:** *your 16-bit number*
For example, 192.168.122.15:1.

Examples

The following example configures a default RD for two VRFs. It illustrates the use of both AS-relative and IP-address-relative RDs:

```
ip vrf vrf_blue
rd 100:3
ip vrf vrf_red
173.13.0.12:200
```

Related Commands

Command	Description
ip vrf	Configures a VRF routing table.
show ip vrf	Displays the set of defined VRFs and associated interfaces.

route-target

To create a route-target extended community for a VRF, use the **route-target** command in VRF configuration submode. To disable the configuration of a route-target community option, use the **no** form of this command.

> **route-target** {**import** | **export** | **both**} *route-target-ext-community*

> **no route-target** {**import** | **export** | **both**} *route-target-ext-community*

Syntax Description

import	Imports routing information from the target VPN extended community.
export	Exports routing information to the target VPN extended community.
both	Imports both import and export routing information to the target VPN extended community.
route-target-ext-community	Adds the route-target extended community attributes to the VRF's list of import, export, or both (import and export) route-target extended communities.

Defaults

There are no defaults. A VRF has no route-target extended community attributes associated with it until specified by the **route-target** command.

Command Modes

VRF configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

The **route-target** command creates lists of import and export route-target extended communities for the specified VRF. Enter the command one time for each target community. Learned routes that carry a specific route-target extended community are imported into all VRFs configured with that extended community as an import route target. Routes learned from a VRF site (for example, by BGP, RIP, or static route configuration) contain export route targets for extended communities configured for the VRF added as route attributes to control the VRFs into which the route is imported.

The route target specifies a target VPN extended community. Like a route-distinguisher, an extended community is composed of either an autonomous system number and an arbitrary number or an IP address and an arbitrary number. You can enter the numbers in either of these formats:

*16-bit AS number***:***your 32-bit number*
For example, 101:3.

*32-bit IP address***:***your 16-bit number*
For example, 192.168.122.15: 1.

Examples

The following example shows how to configure route-target extended community attributes for a VRF. The result of the command sequence is that VRF named *vrf_blue* has two export extended communities (1000:1 and 1000:2) and two import extended communities (1000:1 and 173.27.0.130:200).

```
ip vrf vrf_blue
route-target both 1000:1
route-target export 1000:2
route-target import 173.27.0.130:200
```

Related Commands

Command	Description
ip vrf	Configures a VRF routing table.
import map	Configures an import route map for a VRF.

set ip next-hop verify-availability

To configure policy routing to verify that the next hops of a route map is a CDP neighbor before policy routing to that next hop, use the **set ip next-hop verify-availability** route-map configuration command.

set ip next-hop verify-availability

Syntax Description

This command has no arguments or keywords.

Command Modes

Route-map configuration

Command History

Release	Modification
12.0(3)T	This command was introduced.

Usage Guidelines

This command might be used in a case such as you have some traffic traveling via a satellite to a next hop. It might be prudent to verify that the next hop is reachable before trying to policy route to it.

This command has the following restrictions:

- It causes some performance degradation.
- CDP must be configured on the interface.
- The next hop must be a Cisco device with CDP enabled.
- It is supported in process switching and CEF policy routing, but not available in dCEF, because of the dependency of the CDP neighbor database.

If the router is policy routing packets to the next hop and the next hop happens to be down, the router will try unsuccessfully to use Address Resolution Protocol (ARP) for the next hop (which is down). This behavior will continue forever.

To prevent this situation from occurring, use this command to configure the router to first verify that the next hops of the route map are the router's CDP neighbors before routing to that next hop.

This command is optional because some media or encapsulations do not support CDP, or it may not be a Cisco device that is sending the router traffic.

If this command is set and the next hop is not a CDP neighbor, the router looks to the subsequent next hop, if there is one. If there is none, the packets simply are not policy routed.

If this command is not set, the packets either are successfully policy routed or remain forever unrouted.

If you want to selectively verify availability of only some next hops, you can configure different route map entries (under the same route map name) with different criteria (using access list matching or packet size matching), and use the **set ip next-hop verify-availability** command selectively.

Examples

The following example configures Policy Routing with CEF. Policy routing is configured to verify that next hop 50.0.0.8 of route map named test is a CDP neighbor before the router tries to policy route to it.

If the first packet is being policy routed via route map named test sequence 10, the subsequent packets of the same flow always take the same route map named test sequence 10, not route map named test sequence 20, because they all match or pass access list 1 check.

```
ip cef
interface ethernet0/0/1
 ip route-cache flow
 ip policy route-map test
route-map test permit 10
 match ip address 1
 set ip precedence priority
 set ip next-hop 50.0.0.8
 set ip next-hop verify-availability
route-map test permit 20
```

set mpls experimental

To configure a policy to set the MPLS experimental field within the modular QoS command-line interface (CLI), use the **set mpls experimental** policy-map configuration command. To disable the policy map, use the **no** form of this command.

set mpls experimental *value*

no set mpls experimental *value*

Syntax Description

value	Specifies the value used to set MPLS experimental bits defined by the policy map. Valid values are 0 to 7, and they can be space-delimited. For example, 3 4 7.

Defaults

No default behavior or values.

Command Modes

Policy-map configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

Use the policy map to set the MPLS experimental field when it is undesirable to modify the IP precedence field.

Examples

The following example specifies a policy map named out_pmap. The policy map comprises class maps. Class map mpls_2 matches packets with MPLS experimental field 2 and resets the MPLS experimental field to 3.

```
router(config)# class-map mpls_2
   match mpls experimental 2
router(config)# policy-map out_pmap
   class mpls_2
      set mpls experimental 3
```

Related Commands

Command	Description
class-map	Creates a class map to be used for matching packets to the class specified.
policy-map	Creates a policy map that can be attached to one or more interfaces to specify a service policy.
service-policy	Attaches a policy map to an input interface or an output interface to be used as the service policy for that interface.

set ospf router-id

To set a separate OSPF router ID for each interface or subinterface on a PE router for each directly attached CE router, use the **set ospf router-id** command in route-map configuration mode.

set ospf router-id

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Route-map configuration

Command History

Release	Modification
12.0(7)T	This command was introduced.

Usage Guidelines   To use this command, you must enable OSPF and create a routing process.

Examples   In the following example, the PE router IP address 192.168.0.0 is matched against the interface in access list 1 and set to the OSPF router ID:

```
router ospf 2 vrfvpn1-site1
 redistribute bgp 100 metric-type 1 subnets
 network 202.0.0.0 0.0.0.255 area 1

router bgp 100
 neighbor 172.19.89. 62 remote-as 100
 access-list 1 permit 192.168.0.0
 route-map vpn1-site1-map permit 10
 match ip address 1
 set ospf router-id
```

Related Commands

Command	Description
router ospf	Enables OSPF routing, which places the router in router configuration mode.

set vlan

To group ports into a virtual LAN (VLAN), use the **set vlan** command in privileged EXEC mode.

set vlan *vlan-number module/port*

set vlan *vlan-number* [**name** *name*] [**type** {**ethernet** | **fddi** | **fddinet** | **trcrf** | **trbrf**}]
[**state** {**active** | **suspend**}] [**said** *said*] [**mtu** *mtu*] [**ring** *hex-ring-number*]
[**decring** *decimal-ring-number*] [**bridge** *bridge-number*] [**parent** *vlan-number*] [**mode** {**srt** | **srb**}] [**stp** {**ieee** | **ibm** | **auto**}] [**translation** *vlan-number*] [**backupcrf** {**off** | **on**}]
[**aremaxhop** *hop-count*] [**stemaxhop** *hop-count*]

Syntax Description		
	vlan-number	Number identifying the VLAN.
	module	Number of the module. This argument is not valid when defining or configuring Token Ring Bridge Relay Functions (TRBRFs).
	port	Number of the port on the module belonging to the VLAN; this argument does not apply to TRBRFs.
	name *name*	(Optional) Defines a text string used as the name of the VLAN (1 to 32 characters).
	type {**ethernet**	**fddi**	**fddinet**	**trcrf**	**trbrf**}	(Optional) Identifies the VLAN type. The default type is Ethernet.
	state {**active**	**suspend**}	(Optional) Specifies whether the state of the VLAN is active or suspended. VLANs in suspended state do not pass packets. The default state is active.
	said *said*	(Optional) Specifies the security association identifier. Possible values are 1 to 4294967294. The default is 100001 for VLAN1, 100002 for VLAN 2, 100003 for VLAN 3, and so on. This argument does not apply to Token Ring Concentrator Relay Functions (TRCRFs) or TRBRFs.
	mtu *mtu*	(Optional) Specifies the maximum transmission unit (packet size, in bytes) that the VLAN can use. Possible values are 576 to 18190. The default is 1500 bytes.
	ring *hex-ring-number*	(Optional) Specifies the logical ring number for Token Ring VLANs. Possible values are hexadecimal numbers 0x1 to 0xFFF. This argument is valid and required only when defining a TRCRF.
	decring *decimal-ring-number*	(Optional) Specifies the logical ring number for Token Ring VLANs. Possible values are decimal numbers 1 to 4095. This argument is valid and required only when defining a TRCRF.
	bridge *bridge-number*	(Optional) Specifies the identification number of the bridge. Possible values are hexadecimal numbers 0x1 to 0xF. For Token Ring VLANs, the default is 0F. This argument is not valid for TRCRFs.
	parent *vlan-number*	(Optional) Sets a parent VLAN. The range for *vlan-number* is 2 to 1005. This argument identifies the TRBRF to which a TRCRF belongs and is required when defining a TRCRF.
	mode {**srt**	**srb**}	(Optional) Specfifies the TRCRF bridging mode.
	stp {**ieee**	**ibm**	**auto**}	(Optional) Specifies the Spanning Tree Protocol version for a TRBRF to use: source-routing transparent (**ieee**), source-route bridging (**ibm**), or automatic source selection (**auto**).

translation *vlan-number*	(Optional) Specifies a translational VLAN used to translate FDDI to Ethernet. Valid values are from 1 to 1005. This argument is not valid for defining or configuring Token Ring VLANs.
backupcrf {**off** | **on**}	(Optional) Specifies whether the TRCRF is a backup path for traffic.
aremaxhop *hop-count*	(Optional) Specifies the maximum number of hops for All-Routes Explorer frames. Possible values are 1 to 14. The default is 7. This argument is only valid when defining or configuring TRCRFs.
stemaxhop *hop-count*	(Optional) Specifies the maximum number of hops for Spanning-Tree Explorer frames. Possible values are 1 to 14. The default is 7. This argument is only valid when defining or configuring TRCRFs.

Defaults

The default configuration has all switched Ethernet ports and Ethernet repeater ports in VLAN 1. The default SAID is 100001 for VLAN 1, 100002 for VLAN 2, 100003 for VLAN 3, and so on. The default type is Ethernet. The default MTU is 1500 bytes. The default state is active.

The default TRBRF is 1005, the default TRCRF is 1003, and the default MTU for TRBRFs and TRCRFs is 4472. The default state is active. The default **aremaxhop** is 7; the default **stemaxhop** is 7.

Command Modes

Privileged EXEC

Usage Guidelines

You cannot use the **set vlan** command until the networking device is either in VTP transparent mode (**set vtp mode**) or until a VTP domain name has been set (**set vtp**).

Valid MTU values for Token Ring VLAN are 1500 or 4472. While you can enter any value for the MTU value, the value you enter defaults to the next lowest valid value.

You cannot set multiple VLANs for Inter-Switch Link (ISL) ports using this command. The VLAN name can be from 1 to 32 characters in length. If adding a new VLAN, the VLAN number must be within the range 2 to 1001. When modifying a VLAN, the valid range for the VLAN number is 2 to 1005.

On a new Token Ring VLAN, if you do not specify the parent parameter for a TRCRF, the default TRBRF (1005) is used.

Examples

The following example shows how to set VLAN 850 to include ports 4 through 7 on module 3. Because ports 4 through 7 were originally assigned to TRCRF 1003, the message reflects the modification of VLAN 1003.

```
Router# set vlan 850 3/4-7
VLAN 850 modified.
VLAN 1003 modified.
VLAN  Mod/Ports
---- ----------------------
850   3/4-7
```

Related Commands

Command	Description
clear vlan	Deletes an existing VLAN from a management domain.
show vlans	Displays VLAN subinterfaces.

set vlan mapping

To map 802.1Q virtual LANs (VLANs) to Inter-Switch Link (ISL) VLANs, use the **set vlan mapping** command in privileged EXEC mode.

set vlan mapping dot1q *1q-vlan-number* **isl** *isl-vlan-number*

Syntax Description	

dot1q	Specifies the 802.1Q VLAN.
1q-vlan-number	Number identifying the 802.1Q VLAN; valid values are 1001 to 4095.
isl	Specifies the ISL VLAN.
isl-vlan-number	Number identifying the ISL VLAN; valid values are 1 to 1000.

Defaults

No 802.1Q-to-ISL mappings are defined.

Command Modes

Privileged EXEC

Usage Guidelines

IEEE 802.1Q VLAN trunks support VLANs 1 through 4095. ISL VLAN trunks support VLANs 1 through 1000. The switch automatically maps 802.1Q VLANs 1000 and lower to ISL VLANs with the same number.

The native VLAN of the 802.1Q trunk cannot be used in the mapping.

Use this feature to map 802.1Q VLANs above 1000 to ISL VLANs. Note that if you map a 802.1Q VLAN over 1000 to an ISL VLAN, the corresponding 802.1Q VLAN will be blocked. For example, if you map 802.1Q VLAN 2000 to ISL VLAN 200, then 802.1Q VLAN 200 will be blocked.

You can map up to seven VLANs. Only one 802.1Q VLAN can be mapped to an ISL VLAN. For example, if 802.1Q VLAN 800 has been automatically mapped to ISL VLAN 800, do not manually map any other 802.1Q VLANs to ISL VLAN 800.

You cannot overwrite existing 802.1Q VLAN mapping. If the 802.1Q VLAN number is in the mapping table, the command is aborted. You must first clear that mapping.

If *vlan-number* does not exist, then either of the following occurs:

- If the switch is in server or transparent mode, the VLAN is created with all default values.
- If the switch is in client mode, then the command proceeds without creating the VLAN. A warning will be given indicating that the VLAN does not exist.

If the table is full, the command is aborted with an error message indicating the table is full.

Examples

The following example shows how to map VLAN 1022 to ISL VLAN 850:

```
Router# set vlan mapping dot1q 1022 isl 850
Vlan 850 configuration successful
Vlan mapping successful
```

The following example shows the display if you enter a VLAN that does not exist:

```
Router# set vlan mapping dot1q 1017 isl 999
```

```
Vlan mapping successful
Warning: vlan 999 non-existent
Vlan 999 configuration successful
```

The following example shows the display if you enter an existing mapping:

```
Router# set vlan mapping dot1q 1033 isl 722
722 exists in the mapping table. Please clear the mapping first.
```

The following example shows the display if the mapping table is full:

```
Router# set vlan mapping dot1q 1099 isl 917
Vlan Mapping Table Full.
```

Related Commands

Command	Description
clear vlan mapping	Deletes existing 802.1Q VLAN to ISL VLAN-mapped pairs.
show vlans	Displays VLAN subinterfaces.

shortcut-frame-count

To specify 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, 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.

Defaults

The default is 10 frames.

Command Modes

MPC configuration

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.

Examples

The following example sets the shortcut-setup frame count to 5 for the MPC:

```
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 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).

Defaults

The default is 1 second.

Command Modes

MPC configuration

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.

Examples

The following example sets the shortcut-setup frame time to 7 for the MPC:

```
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 adjacency

To display Cisco Express Forwarding (CEF) adjacency table information, use the **show adjacency** command in EXEC mode.

show adjacency [*type number*] [**detail**] [**summary**]

Syntax Description

type number	(Optional) Displays CEF adjacency information for the specified interface type and number.
detail	(Optional) Displays detailed adjacency information, including Layer 2 information.
summary	(Optional) Displays CEF adjacency table summary information.

Command Modes   EXEC

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
11.1 CC	Multiple platform support was added.

Usage Guidelines   This command is used to verify that an adjacency exits for a connected device, that the adjacency is valid, and that the MAC header rewrite string is correct.

Examples   The following is sample output from the **show adjacency detail** command:

```
Router# show adjacency detail

Protocol Interface              Address
IP       Ethernet1/0/0          9.2.61.1(7)
                                0 packets, 0 bytes
                                00107BC30D5C
                                00500B32D8200800
                                ARP         02:01:49
```

The encapsulatuion string 00107BC30D5C00500B32D8200800 is that of an adjacency used for traffic switched out of a router on an Ethernet link using Ethernet II encapsulation.

The following is sample output from the **show adjacency summary** command:

```
Router# show adjacency summary

Adjacency Table has 1 adjacency
  Interface               Adjacency Count
  Ethernet1/0/0           1
```

Table 3 describes the significant fields shown in the displays.

Table 3 show adjacency detail Field Descriptions

Field	Description
Protocol	The routed protocol to which the adjacency is related.
Interface	The outgoing interface associated with the adjacency.
Address	The address can represent one of these addresses: • Next Hop address • Point-to-Point address The number (in parenthesis) that follows this field indicates the number of internal references to the adjacency.
Source	The source where the adjacency was learned.
Encapsulation string	The string which is prepended to a packet before the packet is transmitted.
Time stamp	The time left before the adjacency rolls out of the adjacency table. A packet must use the same next hop to the destination.

Related Commands

Command	Description
clear adjacency	Clears CEF adjacency table.

show atm vc

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

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

Syntax Description

vcd	(Optional) Specifies the virtual circuit descriptor (VCD) about which to display information.
interface *interface-number*	(Optional) Interface number or subinterface number of the PVC or SVC. Displays all PVCs and SVCs on the specified interface or subinterface.

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

- 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.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.1CA	Information about VCs on an ATM-CES port adapter was added to the command output.
12.0(5)T	Information about VCs on an extended Multiprotocol Label Switching (MPLS) ATM interface was added to the command output.
12.2(25)S	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.
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.

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.

Examples

The following is sample output from the **show atm vc** command when no *vcd* value is specified. The status field is either ACTIVE or 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
```

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

Table 4 describes the fields shown in the displays.

Table 4   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.

Table 4 show atm vc Field Descriptions (continued)

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.
	• DOWN indicates that the connection is not ready for data traffic. When the Status field is DOWN, a State field is shown.
	• INACTIVE indicates that the interface is down.
	• ACTIVE indicates that the interface is in use and active.
etype	Encapsulation type.

Table 4   show atm vc Field Descriptions (continued)

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.
Broadcasts	Number of process-switched broadcast packets.
InFast	Number of fast-switched input packets.

Table 4   show atm vc Field Descriptions (continued)

Field	Description
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 over-subscribed 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.
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 and/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 cable bundle

To display the forwarding table for the specified interface, use the **show cable bundle** privileged EXEC command.

show cable bundle *bundle-number forwarding-table*

Syntax Description

bundle-number	Specifies the bundle identifier. Valid range is from 1 to 255.
forwarding-table	Displays the forwarding table for the specified interface.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(7)XR	This command was introduced.

Examples

In the following example, a cable bundle of 25 is specified:

```
Router# show cable bundle 25 forwarding-table

MAC address          Interface
0050.7366.17ab       Cable3/0
0050.7366.1803       Cable3/0
0050.7366.1801       Cable3/0
```

The fields in the display are described as follows:

- MAC address—Media Access Control ID for each interface in the bundle.

- Interface—The cable interface slot and port number.

Related Commands

Command	Description
cable bundle	Creates an interface bundle.

show cef drop

To display a list of which packets each line card dropped, use the **show cef drop** command in user EXEC or privileged EXEC mode.

show cef drop

Syntax Description   This command has no arguments or keywords.

Command Modes   User EXEC
Privileged EXEC

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
11.1 CC	Multiple platform support was added.
12.0(22)S	The display output for this command was modified to include support for Cisco Express Forwarding for IPv6 (CEFv6) and distributed CEF for IPv6 (dCEFv6) packets.
12.0(23)S	This command was integrated into Cisco IOS Release 12.0(23)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T. Previously there was a **show cef** command, and **drop** was a keyword of that command.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines   A line card might drop packets because of encapsulation failure, absence of route information, or absence of adjacency information.

A packet is sent to a different switching path (punted) because CEF does not support the encapsulation or feature, the packet is destined for the router, or the packet has IP options, such as time stamp and record route. IP options are process switched.

✎

Note   If CEFv6 or dCEFv6 is enabled globally on the router, the **show cef drop** command displays IPv6 CEF counter information and IPv4 CEF counter information. If CEFv6 or dCEFv6 is not enabled globally on the router, the command displays only IPv4 CEF counter information.

Examples

The following is sample output from the **show cef drop** command:

```
Router# show cef drop

CEF Drop Statistics
Slot  Encap_fail  Unresolved Unsupported   No_route    No_adj   ChksumErr
RP           4          89           0          4          0           0
1            0           0           0          0          0           0
2            0           0           5          0          0           5
IPv6 CEF Drop Statistics
Slot  Encap_fail  Unresolved Unsupported   No_route    No_adj
RP           2          33           0          2          0
1            0           0           3          0          0
2            0           0           0          0          0
```

Table 5 describes the significant fields shown in the display.

Table 5   show cef drop Field Descriptions

Field	Description
Slot	The slot number on which the packets were received.
Encap_fail	Indicates the number of packets dropped after exceeding the limit for packets punted to the processor due to missing adjacency information (CEF throttles packets passed up to the process level at a rate of one packet per second).
Unresolved	Indicates the number of packets dropped due to an unresolved prefix in the Forwarding Information Base (FIB) table.
Unsupported	Indicates the number of packets fast-dropped by CEF (drop adjacency).
No_route	Indicates the number of packets dropped due to a missing prefix in the FIB table.
No_adj	Indicates the number of packets dropped due to incomplete adjacency.
ChksumErr	Indicates the number of IPv4 packets received with a checksum error. **Note** This field is not supported for IPv6 packets.

Related Commands

Command	Description
show cef interface	Displays CEF-related interface information.
show ipv6 cef	Displays entries in the IPv6 FIB.

show cef events

To display a list of events internal to the CEF process, use the **show cef events** command in user EXEC or privileged EXEC mode.

show cef events

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0(23)S	This command was introduced.
12.0(24)S	This command was integrated into Cisco IOS Release 12.0(24)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

Examples

The following is sample output from the **show cef events** command:

```
Router# show cef events

CEF events (14/0 recorded/ignored)

Time            Event     Details
+00:00:00.000   SubSys    ipfib init
+00:00:00.000   SubSys    ipfib_ios init
+00:00:00.000   SubSys    ipfib_util init
+00:00:00.000   SubSys    adj_ios init
+00:00:00.000   SubSys    ipfib_les init
+00:00:01.272   Flag      FIB enabled set to yes
+00:00:01.272   Flag      FIB switching enabled set to yes
+00:00:01.272   GState    CEF enabled
+00:00:02.872   Process   Background created
+00:00:02.872   Flag      FIB running set to yes
+00:00:02.872   Process   Background event loop enter
+00:00:02.912   Flag      FIB switching running set to yes
+00:00:02.920   Process   Scanner created
+00:00:02.920   Process   Scanner event loop enter
```

Table 6 describes the significant fields shown in the display.

Table 6   show cef events Field Descriptions

Field	Description
Time	Time that the event occurred.
Event	Type of event that occurred.
Details	Detailed description of the event.

Related Commands

Command	Description
show cef drop	Displays a list of which packets each line card dropped.
show cef interface	Displays CEF-related interface information.
show cef linecard	Displays CEF-related interface information by line card.

show cef interface

To display detailed Cisco Express Forwarding (CEF) information for all interfaces, use the **show cef interface** command in EXEC mode.

show cef interface [*type number*] [**statistics**] [**detail**]

Syntax Description

type number	(Optional) Displays CEF information for the specified interface type and number.
statistics	(Optional) Displays switching statistics for the line card.
detail	(Optional) Displays detailed CEF information for the specified interface type and number.

Command Modes   EXEC

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
11.1 CC	Multiple platform support was added.
12.0(23)S	This command was integrated into Cisco IOS Release 12.0(23)S.
12.0(14)ST	Updated documentation for **statistics** keyword.
12.2(2)T	Updated documentation for **statistics** and **detail** keywords.

Usage Guidelines   You can use this command to show the detailed CEF status for all of the interfaces.

The *type number* arguments display CEF status information for the specified interface type and number.

Examples   The following is sample output from the **show cef interface detail** command for Ethernet interface 1/0/0:

```
Router# show cef interface Ethernet 1/0/0 detail

Ethernet1/0/0 is up (if_number 9)
  Corresponding hwidb fast_if_number 9
  Corresponding hwidb firstsw->if_number 9
  Internet address is 9.2.61.8/24
  ICMP redirects are always sent
  Per packet load-sharing is disabled
  IP unicast RPF check is disabled
  Inbound access list is not set
  Outbound access list is not set
  IP policy routing is disabled
  Hardware idb is Ethernet1/0/0
  Fast switching type 1, interface type 5
  IP Distributed CEF switching enabled
  IP Feature Fast switching turbo vector
  IP Feature CEF switching turbo vector
  Input fast flags 0x0, Output fast flags 0x0
```

```
ifindex 7(7)
Slot 1 Slot unit 0 VC -1
Transmit limit accumulator 0x48001A82 (0x48001A82)
IP MTU 1500
```

The following is sample output from the **show cef interface Null 0 detail** command:

```
Router# show cef interface Null 0 detail

Null0 is up (if_number 1)
  Corresponding hwidb fast_if_number 1
  Corresponding hwidb firstsw->if_number 1
  Internet Protocol processing disabled
  Interface is marked as nullidb
  Packets switched to this interface on linecard are dropped to next slow path
  Hardware idb is Null0
  Fast switching type 13, interface type 0
  IP CEF switching enabled
  IP Feature CEF switching turbo vector
  Input fast flags 0x0, Output fast flags 0x0
  ifindex 0(0)
  Slot -1 Slot unit -1 VC -1
  Transmit limit accumulator 0x0 (0x0)
  IP MTU 1500
```

Table 7 describes the significant fields shown in the display.

Table 7   show cef interface Field Descriptions

Field	Description
Ethernet1/0/0 is {up | down}	Indicates type, number, and status of the interface.
Internet address is	Internet address of the interface.
ICMP redirects are always sent	Indicates how packet forwarding is configured.
Per packet load-sharing is disabled	Indicates status of load sharing on the interface.
IP unicast RPF check is disabled	Indicates status of IP unicast Reverse Path Forwarding (RPF) check on the interface.
Inbound access list is not set	Indicates the number or name of the inbound access list if one is applied to this interface.
Outbound access list is not set	Indicates the number or name of the outbound access list if one is applied to this interface.
IP policy routing is disabled	Indicates the status of IP policy routing on the interface.
Hardware idb is Ethernet1/0/0	Interface type and number configured.
Fast switching type	Used for troubleshooting; indicates switching mode in use.
interface type 5	Indicates interface type.
IP Distributed CEF switching enabled	Indicates whether distributed CEF is enabled on this interface. (7500 and 12000 series Internet routers only.)
IP Feature Fast switching turbo vector	Indicates IP fast switching type configured.
IP Feature CEF switching turbo vector	Indicates IP feature CEF switching type configured.

Table 7   show cef interface Field Descriptions (continued)

Field	Description
Input fast flags	Indicates the input status of various switching features as follows: • 0x0001 (input Access Control List [ACL] enabled) • 0x0002 (policy routing enabled) • 0x0004 (input rate limiting) • 0x0008 (MAC/Prec accounting) • 0x0010 (DSCP/PREC/QOS GROUP) • 0x0020 (input named access lists) • 0x0040 (NAT enabled on input) • 0x0080 (crypto map on input) • 0x0100 (QPPB classification) • 0x0200 (inspect on input) • 0x0400 (input classification) • 0x0800 (casa input enable) • 0x1000 (Virtual Private Network [VPN] enabled on a swidb) • 0x2000 (input idle timer enabled) • 0x4000 (unicast Reverse Path Forwarding [RPF] check) • 0x8000 (per-address ACL enabled) • 0x10000 (Deaggregating a packet) • 0x20000 (GPRS enabled on input) • 0x40000 (URL RenDezvous) • 0x80000 (QoS classification) • 0x100000 (FR switching on i/f) • 0x200000 (WCCP redirect on input) • 0x400000 (input classification)

Table 7   show cef interface Field Descriptions (continued)

Field	Description
Output fast flags	Indicates the output status of various switching features: • 0x0001 (output ACL enabled) • 0x0002 (IP accounting enabled) • 0x0004 (WCC redirect enable i/f) • 0x0008 (rate limiting) • 0x0010 (MAC/Prec accounting) • 0x0020 (DSCP/PREC/QOS GROUP) • 0x0040 (D-QOS classification) • 0x0080 (output named access lists) • 0x0100 (NAT enabled on output) • 0x0200 (TCP intercept enabled) • 0x0400 (crypto map set on output) • 0x0800 (output firewall) • 0x1000 (RSVP classification) • 0x2000 (inspect on output) • 0x4000 (QoS classification) • 0x8000 (QoS pre-classification) • 0x10000 (output stile)
ifindex 7/(7)	Indicates the SNMP ifindex for this interface.
Slot 1 Slot unit 0 VC -1	The slot number and slot unit.
Transmit limit accumulator	Indicates the maximum number of packets allowed in the transmit queue.
IP MTU	The value of the MTU size set on the interface.

Related Commands

Command	Description
show cef drop	Displays a list of which packets each line card dropped.
show cef linecard	Displays CEF-related interface information by line card.

show cef interface policy-statistics

To display detailed Cisco Express Forwarding (CEF) policy statistical information for all interfaces, use the **show cef interface policy-statistics** command in EXEC mode.

show cef interface [*type number*] **policy-statistics**

Syntax Description	*type number*	(Optional) Displays CEF information for the specified interface type and number.

Command Modes EXEC

Command History

Release	Modification
12.0(9)S	This command was introduced to support the Cisco 12000 series Internet router.
12.0(14)ST	This command was introduced to support the Cisco 12000 series Internet router.

Usage Guidelines This command is available only on distributed switching platforms.

The *type number* argument display CEF status information for the specified interface type and number.

Examples The following is sample output from the **show cef interface policy-statistics** command:

```
Router# show cef interface ethernet 1/0 policy-statistics

Ethernet1/0 is up (if_number 3)
  Corresponding hwidb fast_if_number 3
  Corresponding hwidb firstsw->if_number 3
 Index          Packets            Bytes
    1                0                0
    2                0                0
    3                0                0
    4                0                0
    5                0                0
    6                0                0
    7                0                0
    8                0                0
```

Table 8 describes the significant fields shown in the output.

Table 8   show cef interface policy-statistics Field Descriptions

Field	Description
Index	Traffic index set with the **route-map** command.
Packts	Number of packets switched matching the index definition.
Bytes	Number of bytes switched matching the index definition.

Related Commands

Command	Description
show cef drop	Displays a list of which packets each line card dropped.
show cef linecard	Displays CEF-related interface information by line card.

show cef linecard

To display Cisco Express Forwarding (CEF)-related information by line card, use the **show cef linecard** command in EXEC mode.

show cef linecard [*slot-number*] [**detail**]

Syntax Description

slot-number	(Optional) Slot number containing the line card about which to display CEF-related information. When you omit this argument, information about all line cards is displayed.
detail	(Optional) Displays detailed CEF information for the specified line card.

Command Modes   EXEC

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
11.1 CC	Multiple platform support was added.
12.0(10)S	Output display was changed.
12.1(2)T	This command was integrated into Cisco IOS Release 12.1(2)T.

Usage Guidelines   This command is available only on distributed switching platforms.

When you omit the *slot-number* argument, information about all line cards is displayed. When you omit the *slot-number* argument and include the **detail** keyword, detailed information is displayed for all line cards. When you omit all keywords and arguments, the **show cef linecard** command displays important information about all line cards in table format.

Examples   The following is sample output from the **show cef linecard detail** command for all line cards:

```
Router# show cef linecard detail

CEF linecard slot number 0, status up
 Sequence number 4, Maximum sequence number expected 28, Seq Epoch 2
 Send failed 0, Out Of Sequence 0, drops 0
 Linecard CEF reset 0, reloaded 1
 95 elements packed in 6 messages(3588 bytes) sent
 69 elements cleared
 linecard in sync after reloading
 0/0/0 xdr elements in LowQ/MediumQ/HighQ
 11/9/69 peak elements on LowQ/MediumQ/HighQ
 Input  packets 0, bytes 0
 Output packets 0, bytes 0, drops 0
 CEF Table statistics:
 Table name                 Version Prefix-xdr Status
 Default-table                   7           4 Active, up, sync
CEF linecard slot number 1, status up
```

```
Sequence number 4, Maximum sequence number expected 28, Seq Epoch 2
Send failed 0, Out Of Sequence 0, drops 0
Linecard CEF reset 0, reloaded 1
95 elements packed in 6 messages(3588 bytes) sent
69 elements cleared
linecard in sync after reloading
0/0/0 xdr elements in LowQ/MediumQ/HighQ
11/9/69 peak elements on LowQ/MediumQ/HighQ
Input  packets 0, bytes 0
Output packets 0, bytes 0, drops 0
CEF Table statistics:
Table name                   Version Prefix-xdr Status
Default-table                    7          4 Active, up, sync
```

The following is sample output from the **show cef linecard** command. The command displays information for all line cards in table format.

```
Router# show cef linecard

Slot    MsgSent    XDRSent   Window   LowQ   MedQ   HighQ Flags
0             6         95      24      0      0       0 up
1             6         95      24      0      0       0 up
VRF Default-table, version 8, 6 routes
Slot Version    CEF-XDR   I/Fs State     Flags
0         7         4       8 Active    up, sync
1         7         4      10 Active    up, sync
```

Table 9 describes the significant fields shown in the displays.

Table 9   show cef linecard Field Descriptions

Field	Description
Table name	Name of the CEF table.
Version	Number of forwarding information base (FIB) table version.
Prefix-xdr	Number of prefix XDRs processed.
Status	State of the CEF table.
Slot	Slot number of the line card.
MsgSent	Number of interprocess communication (IPC) messages sent.
XDRSent	IPC information elements (XDRs) packed into IPC messages sent from the RP to the line card.
Window	Size of the IPC window between the line card and RP.
LowQ/MedQ/HighQ	Number of XDR elements in the Low, Medium, and High priority queues.
Flags	Indicates the status of the line card. Possible states are the following: • upLine card is up. • syncLine card is in synchronization with the main FIB. • FIB is repopulated on the line card. • resetLine card FIB is reset. • reloadingLine card FIB is being reloaded. • disabledLine card is disabled.

Table 9   show cef linecard Field Descriptions (continued)

Field	Description
CEF-XDR	Number of CEF XDR messages processed.
I/Fs	Interface numbers.

Related Commands

Command	Description
show cef drop	Displays a list of which packets each line card dropped.
show cef interface	Displays CEF-related interface information.

show cef not-cef-switched

To display which packets were sent to a different switching path, use the **show cef not-cef-switched** command in user EXEC or privileged EXEC mode.

show cef not-cef-switched

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
11.1 CC	Multiple platform support was added.
12.0(22)S	The display output for this command was modified to include support for Cisco Express Forwarding for IPv6 (CEFv6) and distributed CEF for IPv6 (dCEFv6) packets.
12.0(23)S	This command was integrated into Cisco IOS Release 12.0(23)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T. Previously there was a **show cef** command, and **drop** was a keyword of that command.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines

If packets are not being cef switched and you want to determine why, enter the **show cef not-cef switched** command.

> **Note**   If CEFv6 or dCEFv6 is enabled globally on the router, the **show cef not-cef-switched** command displays IPv6 CEF counter information and IPv4 CEF counter information. If CEFv6 or dCEFv6 is not enabled globally on the router, the command displays only IPv4 CEF counter information.

Examples

The following is sample output from the **show cef not-cef switched** command:

```
Router# show cef not-cef-switched

CEF Packets passed on to next switching layer
Slot No_adj No_encap Unsupp'ted Redirect  Receive  Options  Access   Frag
RP       0       0        0          0      91584        0        0      0
1        0       0        0          0          0        0        0      0
2        0       0        0          0          0        0        0      0
IPv6 CEF Packets passed on to next switching layer
Slot No_adj No_encap Unsupp'ted Redirect  Receive  Options  Access   MTU
RP       0       0        0          0      92784        0        0      0
1        0       0        0          0          0        0        0      0
2        0       0        0          0          0        0        0      0
```

Table 10 describes the significant fields shown in the display.

Table 10   show cef not-cef-switched Field Descriptions

Field	Meaning
Slot	The slot number on which the packets were received.
No_adj	Indicates the number of packets sent to the processor due to incomplete adjacency.
No_encap	Indicates the number of packets sent to the processor for Address Resolution Protocol (ARP) resolution.
Unsupp'ted	Indicates the number of packets punted to the next switching level due to unsupported features.
Redirect	Records packets that are ultimately destined to the router, and packets destined to a tunnel endpoint on the router. If the decapsulated tunnel is IP, it is CEF switched; otherwise, packets are process switched.
Receive	Indicates the number of packets ultimately destined to the router, or packets destined to a tunnel endpoint on the router. If the decapsulated tunnel packet is IP, the packet is CEF switched. Otherwise, packets are process switched.
Options	Indicates the number of packets with options. Packets with IP options are handled only at the process level.
Access	Indicates the number of packets punted due to an access list failure.
Frag	Indicates the number of packets punted due to fragmentation failure. **Note** This field is not supported for IPv6 packets.
MTU	Indicates the number of packets punted due to maximum transmission unit (MTU) failure. **Note** This field is not supported for IPv4 packets.

Related Commands

Command	Description
show cef drop	Display a list of which packets each line card dropped.
show cef interface	Displays CEF-related interface information.
show ipv6 cef	Displays entries in the IPv6 FIB.

show cef timers

To display the current state of the timers internal to the CEF process, use the **show cef timers** command in user EXEC or privileged EXEC mode.

show cef timers

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.

Examples

The following is sample output from the **show cef timers** command:

```
Router# show cef timers

CEF background process
    Expiration   Type
          0.208 (parent)
              0.208 adjacency update hwidb
              0.540 slow resolution
              1.208 ARP throttle

CEF FIB scanner process
    Expiration   Type
         44.852 (parent)
             44.852  checker scan-rib
```

Table 11 describes the significant fields shown in the display.

Table 11   show cef timers Field Descriptions

Field	Description
Expiration	Seconds in which the timers will expire.
Type	Identification of the timer.

Related Commands

Command	Description
show cef interface	Displays CEF-related interface information.
show ipv6 cef	Displays entries in the IPv6 FIB.

show controllers vsi control-interface

To display information about an ATM interface configured with the **tag-control-protocol vsi** EXEC command to control an external switch (or if an interface is not specified, to display information about all VSI control interfaces), use the **show controllers vsi control-interface** command.

show controllers vsi control-interface [*interface*]

Syntax Description

interface	(Optional) Specifies the interface number.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Examples

The following is sample output from the **show controllers vsi control-interface** command:

```
Router# show controllers vsi control-interface

Interface:        ATM2/0        Connections:          14
```

The display shows the number of cross-connects currently on the switch that were established by the MPLS LSC through the VSI over the control interface.

Related Commands

Command	Description
tag-control-protocol vsi	Configures the use of VSI on a control port.

show controllers vsi descriptor

To display information about a switch interface discovered by the MPLS LSC through VSI, or if no descriptor is specified, about all such discovered interfaces, use the **show controllers vsi descriptor** EXEC command.

show controllers vsi descriptor [*descriptor*]

Syntax Description

descriptor	(Optional) Physical descriptor. For the Cisco BPX switch, the physical descriptor has the following form: *slot.port.0*

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

Specify an interface by its (switch-supplied) physical descriptor.

Per-interface information includes the following:

- Interface name
- Physical descriptor
- Interface status
- Physical interface state (supplied by the switch)
- Acceptable VPI and VCI ranges
- Maximum cell rate
- Available cell rate (forward/backward)
- Available channels

Similar information is displayed when you enter the **show controllers XTagATM** EXEC command. However, you must specify a Cisco IOS interface name instead of a physical descriptor.

Examples

The following is sample output from the **show controllers vsi descriptor** command:

```
Router# show controllers vsi descriptor 12.2.0

Phys desc: 12.2.0
Log intf:  0x000C0200 (0.12.2.0)
Interface: XTagATM0
IF status: up                   IFC state: ACTIVE
Min VPI:   1                     Maximum cell rate:  10000
Max VPI:   259                   Available channels: 2000
```

```
Min VCI:   32                  Available cell rate (forward):  10000
Max VCI:   65535               Available cell rate (backward): 10000
```

Table 12 describes the significant fields in the output.

Table 12   show controllers vsi descriptor Field Descriptions

Field	Description
Phys desc	Physical descriptor. A string learned from the switch that identifies the interface.
Log intf	Logical interface ID. This 32-bit entity, learned from the switch, uniquely identifies the interface.
Interface	The (Cisco IOS) interface name.
IF status	Overall interface status. Can be "up," "down," or "administratively down."
Min VPI	Minimum virtual path identifier. Indicates the low end of the VPI range configured on the switch.
Max VPI	Maximum virtual path identifier. Indicates the high end of the VPI range configured on the switch.
Min VCI	Minimum virtual path identifier. Indicates the high end of the VPI range configured on the switch.
Max VCI	Maximum virtual channel identifier. Indicates the high end of the VCI range configured on, or determined by, the switch.
IFC state	Operational state of the interface, according to the switch. Can be one of the following: • FAILED_EXT (that is, an external alarm) • FAILED_INT (indicates the inability of the MPLS LSC to communicate with the VSI slave controlling the interface, or another internal failure) • REMOVED (administratively removed from the switch)
Maximum cell rate	Maximum cell rate for the interface, which has been configured on the switch (in cells per second).
Available channels	Indicates the number of channels (endpoints) that are currently free to be used for cross-connects.
Available cell rate (forward)	Cell rate that is currently available in the forward (that is, ingress) direction for new cross-connects on the interface.
Available cell rate (backward)	Cell rate that is currently available in the backward (that is, egress) direction for new cross-connects on the interface.

Related Commands

Command	Description
show controllers XTagATM	Displays information about an extended MPLS ATM interface.

show controllers vsi session

To display information about all sessions with VSI slaves, use the **show controllers vsi session** EXEC command.

> **show controllers vsi session** [*session-num* [**interface** *interface*]]

> **Note** A session consists of an exchange of VSI messages between the VSI master (the LSC) and a VSI slave (an entity on the switch). There can be multiple VSI slaves for a switch. On the BPX, each port or trunk card assumes the role of a VSI slave.

Syntax Description

session-num	(Optional) Specifies the session number.
interface *interface*	(Optional) Specifies the VSI control interface.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

If a session number and an interface are specified, detailed information on the individual session is presented. If the session number is specified, but the interface is omitted, detailed information on all sessions with that number is presented. (Only one session can contain a given number, because multiple control interfaces are not supported.)

Examples

The following is sample output from the **show controllers vsi session** command:

```
Router# show controllers vsi session

Interface    Session   VCD    VPI/VCI    Switch/Slave Ids    Session State

ATM0/0       0         1      0/40       0/1                 ESTABLISHED
ATM0/0       1         2      0/41       0/2                 ESTABLISHED
ATM0/0       2         3      0/42       0/3                 DISCOVERY
ATM0/0       3         4      0/43       0/4                 RESYNC-STARTING
ATM0/0       4         5      0/44       0/5                 RESYNC-STOPPING
ATM0/0       5         6      0/45       0/6                 RESYNC-UNDERWAY
ATM0/0       6         7      0/46       0/7                 UNKNOWN
ATM0/0       7         8      0/47       0/8                 UNKNOWN
ATM0/0       8         9      0/48       0/9                 CLOSING
ATM0/0       9         10     0/49       0/10                ESTABLISHED
```

```
ATM0/0      10      11    0/50      0/11              ESTABLISHED
ATM0/0      11      12    0/51      0/12              ESTABLISHED
```

Table 13 describes the significant fields in the output.

Table 13   show controllers vsi session Field Descriptions

Field	Description
Interface	Control interface name.
Session	Session number (from 0 to <*n–1*>), where *n* is the number of sessions on the control interface.
VCD	Virtual circuit descriptor (virtual circuit number). Identifies the VC carrying the VSI protocol between the master and the slave for this session.
VPI/VCI	Virtual path identifier or virtual channel identifier (for the VC used for this session).
Switch/Slave Ids	Switch and slave identifiers supplied by the switch.
Session State	Indicates the status of the session between the master and the slave. • ESTABLISHED is the fully operational steady state. • UNKNOWN indicates that the slave is not responding. Other possible states include the following: • CONFIGURING • RESYNC_STARTING • RESYNC_UNDERWAY • RESYNC_ENDING • DISCOVERY • SHUTDOWN_STARTING • SHUTDOWN_ENDING • INACTIVE

In the following example, session number 9 is specified with the **show controllers vsi session** command:

```
Router# show controllers vsi session 9

Interface:          ATM1/0         Session number:      9
VCD:                10             VPI/VCI:             0/49
Switch type:        BPX            Switch id:           0
Controller id:      1              Slave id:            10
Keepalive timer:    15             Powerup session id:  0x0000000A
Cfg/act retry timer: 8/8           Active session id:   0x0000000A
Max retries:        10             Ctrl port log intf:  0x000A0100
Trap window:        50             Max/actual cmd wndw: 21/21
Trap filter:        all            Max checksums:       19
Current VSI version: 1             Min/max VSI version: 1/1
Messages sent:      2502           Inter-slave timer:   4.000
Messages received:  2502           Messages outstanding: 0
```

Table 14 describes the significant fields in the output.

Table 14   show controllers vsi session Field Descriptions

Field	Description
Interface	Name of the control interface on which this session is configured.
Session number	A number from 0 to <*n*–1>, where *n* is the number of slaves. Configured on the MPLS LSC with the **slaves** option of the **tag-control-protocol vsi** command.
VCD	Virtual circuit descriptor (virtual circuit number). Identifies the VC that carries VSI protocol messages for this session.
VPI/VCI	Virtual path identifier or virtual channel identifier for the VC used for this session.
Switch type	Switch device (for example, the BPX).
Switch id	Switch identifier (supplied by the switch).
Controller id	Controller identifier. Configured on the LSC, and on the switch, with the **id** option of the **tag-control-protocol vsi** command.
Slave id	Slave identifier (supplied by the switch).
Keepalive timer	VSI master keepalive timeout period (in seconds). Configured on the MPLS LSC through the **keepalive** option of the **tag-control-protocol-vsi** command. If no valid message is received by the MPLS LSC within this time period, it sends a keepalive message to the slave.
Powerup session id	Session ID (supplied by the slave) used at powerup time.
Cfg/act retry timer	Configured and actual message retry timeout period (in seconds). If no response is received for a command sent by the master within the actual retry timeout period, the message is resent. This applies to most message transmissions. The configured retry timeout value is specified through the **retry** option of the **tag-control-protocol vsi** command. The actual retry timeout value is the larger of the configured value and the minimum retry timeout value permitted by the switch.
Active session id	Session ID (supplied by the slave) for the currently active session.
Max retries	Maximum number of times that a particular command transmission will be retried by the master. That is, a message may be sent up to <max_retries+1> times. Configured on the MPLS LSC through the **retry** option of the **tag-control-protocol vsi** command.
Ctrl port log intf	Logical interface identifier for the control port, as supplied by the switch.
Trap window	Maximum number of outstanding trap messages permitted by the master. This is advertised, but not enforced, by the LSC.
Max/actual cmd wndw	Maximum command window is the maximum number of outstanding (that is, unacknowledged) commands that may be sent by the master before waiting for acknowledgments. This number is communicated to the master by the slave.
	The command window is the maximum number of outstanding commands that are permitted by the master, before it waits for acknowledgments. This is always less than the maximum command window.

Table 14   show controllers vsi session Field Descriptions (continued)

Field	Description
Trap filter	This is always "all" for the LSC, indicating that it wants to receive all traps from the slave. This is communicated to the slave by the master.
Max checksums	Maximum number of checksum blocks supported by the slave.
Current VSI version	VSI protocol version currently in use by the master for this session.
Min/max VSI version	Minimum and maximum VSI versions supported by the slave, as last reported by the slave. If both are zero, the slave has not yet responded to the master.
Messages sent	Number of commands sent to the slave.
Inter-slave timer	Timeout value associated by the slave for messages it sends to other slaves.
	On a VSI-controlled switch with a distributed slave implementation (such as the BPX), VSI messages may be sent between slaves to complete their processing.
	For the MPLS LSC VSI implementation to function properly, the value of its retry timer is forced to be at least two times the value of the interslave timer. (See "Cfg/act retry timer" in this table.)
Messages received	Number of responses and traps received by the master from the slave for this session.
Messages outstanding	Current number of outstanding messages (that is, commands sent by the master for which responses have not yet been received).

Related Commands

Command	Description
tag-control-protocol vsi	Configures the use of VSI on a control port.

show controllers vsi status

To display a one-line summary of each VSI-controlled interface, use the **show controllers vsi status** EXEC command.

show controllers vsi status

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Related Commands   EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines   If an interface has been discovered by the LSC, but no extended MPLS ATM interface has been associated with it through the **extended-port** interface configuration command, then the interface name is marked <unknown>, and interface status is marked n/a.

Examples   The following is sample output from the **show controllers vsi status** command:

```
Router# show controllers vsi status

Interface Name                  IF Status   IFC State  Physical Descriptor
switch control port                   n/a       ACTIVE  12.1.0
XTagATM0                               up       ACTIVE  12.2.0
XTagATM1                               up       ACTIVE  12.3.0
<unknown>                             n/a   FAILED-EXT  12.4.0
```

Table 15 describes the significant fields in the output.

Table 15   show controllers vsi status Field Descriptions

Field	Description
Interface Name	The (Cisco IOS) interface name.
IF Status	Overall interface status. Can be "up," "down," or "administratively down."

Table 15   show controllers vsi status Field Descriptions (continued)

Field	Description
IFC State	The operational state of the interface, according to the switch. Can be one of the following: • FAILED_EXT (that is, an external alarm) • FAILED_INT (indicates the inability of the MPLS LSC to communicate with the VSI slave controlling the interface, or another internal failure) • REMOVED (administratively removed from the switch)
Physical Descriptor	A string learned from the switch that identifies the interface.

show controllers vsi traffic

To display traffic information about VSI-controlled interfaces, VSI sessions, or VCs on VSI-controlled interfaces, use the **show controllers vsi traffic** EXEC command.

> **show controllers vsi traffic** [{**descriptor** *descriptor* | **session** *session-num* | **vc** [**descriptor** *descriptor* [*vpi vci*]]}]

Syntax Description		
descriptor *descriptor*	(Optional) Specifies the interface.
session *session-num*	(Optional) Specifies a session number.
vc	(Optional) Virtual circuit.
vpi	(Optional) Virtual path identifier.
vci	(Optional) Virtual circuit identifier.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

If none of the optional command parameters is specified, traffic for all interfaces is displayed. You can specify a single interface by its (switch-supplied) physical descriptor. For the BPX, the physical descriptor has the form *slot.port. 0*.

If a session number is specified, VSI protocol traffic counts by message type are displayed. The VC traffic display is the same as the one produced by the **show xtagatm vc cross-connect traffic descriptor** EXEC command.

Examples The following is sample output from the **show controllers vsi traffic** command:

```
Router# show controllers vsi traffic

Phys desc: 10.1.0
Interface: switch control port
IF status: n/a
Rx cells: 304250         Rx cells discarded: 0
Tx cells: 361186         Tx cells discarded: 0
Rx header errors: 4294967254 Rx invalid addresses (per card): 80360
Last invalid address: 0/53

Phys desc: 10.2.0
Interface: XTagATM0
IF status: up
Rx cells: 202637         Rx cells discarded: 0
Tx cells: 194979         Tx cells discarded: 0
Rx header errors: 4294967258 Rx invalid addresses (per card): 80385
Last invalid address: 0/32

Phys desc: 10.3.0
Interface: XTagATM1
IF status: up
Rx cells: 182295         Rx cells discarded: 0
Tx cells: 136369         Tx cells discarded: 0
Rx header errors: 4294967262 Rx invalid addresses (per card): 80372
Last invalid address: 0/32
```

Table 16 describes the significant fields in the output.

Table 16   show controllers vsi traffic Field Descriptions

Field	Description
Phys desc	Physical descriptor of the interface.
Interface	The (Cisco IOS) interface name.
Rx cells	Number of cells received on the interface.
Tx cells	Number of cells sent on the interface.
Rx cells discarded	Number of cells received on the interface that were discarded due to traffic management.
Tx cells discarded	Number of cells that could not be sent on the interface due to traffic management and that were therefore discarded.
Rx header errors	Number of cells that were discarded due to ATM header errors.
Rx invalid addresses	Number of cells received with an invalid address (that is, an unexpected VPI/VCI combination). With the Cisco BPX switch, this count is of all such cells received on all interfaces in the port group of this interface.
Last invalid address	Number of cells received on this interface with ATM cell header errors.

The following sample output is displayed when you enter the **show controllers vsi traffic session 9** command:

```
Router# show controllers vsi traffic session 9
                         Sent                              Received
Sw Get Cnfg Cmd:         3656       Sw Get Cnfg Rsp:        3656
Sw Cnfg Trap Rsp:        0          Sw Cnfg Trap:           0
Sw Set Cnfg Cmd:         1          Sw Set Cnfg Rsp:        1
Sw Start Resync Cmd:     1          Sw Start Resync Rsp:    1
Sw End Resync Cmd:       1          Sw End Resync Rsp:      1
Ifc Getmore Cnfg Cmd:    1          Ifc Getmore Cnfg Rsp:   1
Ifc Cnfg Trap Rsp:       4          Ifc Cnfg Trap:          4
Ifc Get Stats Cmd:       8          Ifc Get Stats Rsp:      8
Conn Cmt Cmd:            73         Conn Cmt Rsp:           73
Conn Del Cmd:            50         Conn Del Rsp:           0
Conn Get Stats Cmd:      0          Conn Get Stats Rsp:     0
Conn Cnfg Trap Rsp:      0          Conn Cnfg Trap:         0
Conn Bulk Clr Stats Cmd: 0          Conn Bulk Clr Stats Rsp: 0
Gen Err Rsp:             0          Gen Err Rsp:            0
unused:                  0          unused:                 0
unknown:                 0          unknown:                0
TOTAL:                   3795       TOTAL:                  3795
```

Table 17 describes the significant fields in the output.

Table 17   show controllers vsi traffic session Field Descriptions

Field	Description
Sw Get Cnfg Cmd	Number of VSI "get switch configuration command" messages sent.
Sw Cnfg Trap Rsp	Number of VSI "switch configuration asynchronous trap response" messages sent.
Sw Set Cnfg Cmd	Number of VSI "set switch configuration command" messages sent.
Sw Start Resync Cmd	Number of VSI "set resynchronization start command" messages sent.
Sw End Resync Cmd	Number of VSI "set resynchronization end command" messages sent.
Ifc Getmore Cnfg Cmd	Number of VSI "get more interfaces configuration command" messages sent.
Ifc Cnfg Trap Rsp	Number of VSI "interface configuration asynchronous trap response" messages sent.
Ifc Get Stats Cmd	Number of VSI "get interface statistics command" messages sent.
Conn Cmt Cmd	Number of VSI "set connection committed command" messages sent.
Conn Del Cmd	Number of VSI "delete connection command" messages sent.
Conn Get Stats Cmd	Number of VSI "get connection statistics command" messages sent.
Conn Cnfg Trap Rsp	Number of VSI "connection configuration asynchronous trap response" messages sent.
Conn Bulk Clr Stats Cmd	Number of VSI "bulk clear connection statistics command" messages sent.
Gen Err Rsp	Number of VSI "generic error response" messages sent or received.
Sw Get Cnfg Rsp	Number of VSI "get connection configuration command response" messages received.
Sw Cnfg Trap	Number of VSI "switch configuration asynchronous trap" messages received.

Table 17   show controllers vsi traffic session Field Descriptions (continued)

Field	Description
Sw Set Cnfg Rsp	Number of VSI "set switch configuration response" messages received.
Sw Start Resync Rsp	Number of VSI "set resynchronization start response" messages received.
Sw End Resync Rsp	Number of VSI "set resynchronization end response" messages received.
Ifc Getmore Cnfg Rsp	Number of VSI "get more interfaces configuration response" messages received.
Ifc Cnfg Trap	Number of VSI "interface configuration asynchronous trap" messages received.
Ifc Get Stats Rsp	Number of VSI "get interface statistics response" messages received.
Conn Cmt Rsp	Number of VSI "set connection committed response" messages received.
Conn Del Rsp	Number of VSI "delete connection response" messages received.
Conn Get Stats Rsp	Number of VSI "get connection statistics response" messages received.
Conn Cnfg Trap	Number of VSI "connection configuration asynchronous trap" messages received.
Conn Bulk Clr Stats Rsp	Number of VSI "bulk clear connection statistics response" messages received.
unused, unknown	"Unused" messages are those whose function codes are recognized as being part of the VSI protocol, but that are not used by the MPLS LSC and, consequently, are not expected to be received or sent. "Unknown" messages have function codes that the MPLS LSC does not recognize as part of the VSI protocol.
TOTAL	Total number of VSI messages sent or received.

show controllers XTagATM

To display information about an extended MPLS ATM interface controlled through the VSI protocol (or, if an interface is not specified, to display information about all extended MPLS ATM interfaces controlled through the VSI protocol), use the **show controllers XTagATM** EXEC command.

show controllers XTagATM *if-num*

Syntax Description

if-num	Specifies the interface number.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

Per-interface information includes the following:

- Interface name
- Physical descriptor
- Interface status
- Physical interface state (supplied by the switch)
- Acceptable VPI and VCI ranges
- Maximum cell rate
- Available cell rate (forward/backward)
- Available channels

Similar information appears if you enter the **show controllers vsi descriptor** EXEC command. However, you must specify an interface by its (switch-supplied) physical descriptor, instead of its Cisco IOS interface name. For the Cisco BPX switch, the physical descriptor has the form *slot.port.0*.

Examples

In this example, the sample output is from the **show controllers XTagATM** command specifying interface 0:

```
Router# show controllers XTagATM 0

Interface XTagATM0 is up
Hardware is Tag-Controlled ATM Port (on BPX switch BPX-VSI1)
Control interface ATM1/0 is up
Physical descriptor is 10.2.0
Logical interface 0x000A0200 (0.10.2.0)
Oper state ACTIVE, admin state UP
```

```
VPI range 1-255, VCI range 32-65535
VPI is not translated at end of link
Tag control VC need not be strictly in VPI/VCI range
Available channels: ingress 30, egress 30
Maximum cell rate: ingress 300000, egress 300000
Available cell rate: ingress 300000, egress 300000
Endpoints in use: ingress 7, egress 8, ingress/egress 1
Rx cells 134747
rx cells discarded 0, rx header errors 0
rx invalid addresses (per card): 52994
last invalid address 0/32
Tx cells 132564
tx cells discarded: 0
```

Table 18 describes the significant fields in the output.

Table 18   show controllers XTagATM Field Descriptions

Field	Description
Interface XTagATM0 is up	Indicates the overall status of the interface. May be "up," "down," or "administratively down."
Hardware is Tag-Controlled ATM Port	Indicates the hardware type.
	If the XTagATM was successfully associated with a switch port, a description of the form (on <switch_type> switch <name>) follows this field, where <switch_type> indicates the type of switch (for example, BPX), and the name is an identifying string learned from the switch.
	If the XTagATM interface was not bound to a switch interface (with the **extended-port** interface configuration command), then the label "Not bound to a control interface and switch port" appears.
	If the interface has been bound, but the target switch interface has not been discovered by the LSC, then the label "Bound to undiscovered switch port (id <number>)" appears, where <number> is the logical interface ID in hexadecimal notation.
Control interface ATM1/0 is up	Indicates that the XTagATM interface was bound (with the **extended-port** interface configuration command) to the VSI master whose control interface is ATM1/0 and that this control interface is up.
Physical descriptor is...	A string identifying the interface that was learned from the switch.
Logical interface	This 32-bit entity, learned from the switch, uniquely identifies the interface. It appears in both hexadecimal and dotted quad notation.
Oper state	Operational state of the interface, according to the switch. Can be one of the following:
	• ACTIVE
	• FAILED_EXT (that is, an external alarm)
	• FAILED_INT (indicates the inability of the MPLS LSC to communicate with the VSI slave controlling the interface, or another internal failure)
	• REMOVED (administratively removed from the switch)
admin state	Administrative state of the interface, according to the switch—either "Up" or "Down."

Table 18 show controllers XTagATM Field Descriptions (continued)

Field	Description
VPI range 1 to 255	Indicates the allowable VPI range for the interface that was configured on the switch.
VCI range 32 to 65535	Indicates the allowable VCI range for the interface that was configured on, or determined by, the switch.
LSC control VC need not be strictly in VPI or VCI range	Indicates that the label control VC does not need to be within the range specified by VPI range, but may be on VPI 0 instead.
Available channels	Indicates the number of channels (endpoints) that are currently free to be used for cross-connects.
Maximum cell rate	Maximum cell rate for the interface, which was configured on the switch.
Available cell rate	Cell rate that is currently available for new cross-connects on the interface.
Endpoints in use	Number of endpoints (channels) in use on the interface, broken down by anticipated traffic flow, as follows: • Ingress—Endpoints carry traffic into the switch • Egress—Endpoints carry traffic away from the switch • Ingress/egress—Endpoints carry traffic in both directions
Rx cells	Number of cells received on the interface.
rx cells discarded	Number of cells received on the interface that were discarded due to traffic management actions (rx header errors).
rx header errors	Number of cells received on the interface with cell header errors.
rx invalid addresses (per card)	Number of cells received with invalid addresses (that is, unexpected VPI or VCI.). On the BPX, this counter is maintained per port group (not per interface).
last invalid address	Address of the last cell received on the interface with an invalid address (for example, 0/32).
Tx cells	Number of cells sent from the interface.
tx cells discarded	Number of cells intended for transmission from the interface that were discarded due to traffic management actions.

Related Commands

Command	Description
show controllers vsi descriptor	Displays information about a switch interface discovered by the MPLS LSC through the VSI.

show interface stats

To display numbers of packets that were process switched, fast switched, and distributed switched, use the **show interface stats** command in EXEC mode.

show interface *type number* **stats**

Syntax Description

type number	Interface type and number about which to display statistics.

Command Modes

EXEC

Command History

Release	Modification
11.0	This command was introduced.

Usage Guidelines

Use this command on the RP.

✎

Note When fast switching is configured on the outbound interface, and RSP optimum, RSP flow, and VIP DFS switching modes are all specified on the incoming interface, the interface on which RSP optimum, RSP flow, and VIP DFS switching modes is not enabled can still show packets switched out via those switching paths when packets are received from other interfaces with RSP optimum, RSP flow, and VIP DES switching modes enabled.

Examples

The following is sample output from the **show interface stats** command:

```
Router# show interface fddi 3/0/0 stats

Fddi3/0/0
        Switching path    Pkts In    Chars In    Pkts Out  Chars Out
            Processor    3459994 1770812197    4141096 1982257456
          Route cache   10372326 3693920448     439872  103743545
     Distributed cache  19257912 1286172104   86887377 1184358085
                Total   33090232 2455937453   91468345 3270359086
```

Table 19 describes the significant fields in the display.

Table 19   show interface stats Field Descriptions

Field	Description
Fddi3/0/0	Interface for which information is shown.
Switching path	Column heading for the various switching paths below it.
Pkts In	Number of packets received in each switching mechanism.
Chars In	Number of characters received in each switching mechanism.

Table 19   show interface stats Field Descriptions (continued)

Field	Description
Pkts Out	Number of packets sent out each switching mechanism.
Chars Out	Number of characters sent out each switching mechanism.