

## name local-seg-id

To specify or replace the ring number of the emulated LAN 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	
<i>elan-name</i>	Name of the emulated LAN. The maximum length of the name is 32 characters.
<i>segment-number</i>	Segment number to be assigned to the emulated LAN. The number ranges from 1 to 4095.

**Defaults** No emulated LAN 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 emulated LAN. The **no** form of this command deletes the relationships.

**Examples** The following example specifies a ring number of 1024 for the emulated LAN *red*:

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

Related Commands	Command	Description
	<b>default-name</b>	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.
	<b>lane database</b>	Creates a named configuration database that can be associated with a configuration server.
	<b>mac-address</b>	Sets the MAC layer address of the Cisco Token Ring.

# name preempt

To set the 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	<i>elan-name</i>	Specifies the name of the ELAN.
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Defaults	Preemption is off by default.
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Command Modes	LANE database configuration
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Command History	Release	Modification
	11.3	This command was introduced.

Usage Guidelines	<p>In prior releases, when the primary LES failed, 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. In this release, 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.</p> <p>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 <b>name</b> <i>elan-name</i> <b>preempt</b> command in the LECS database.</p>
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Examples	The following example sets the ELAN preempt for the ELAN named MYELAN:
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```
name MYELAN preempt
```

## name server-atm-address

To specify or replace the ATM address of the LANE server for the emulated LAN 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

<i>elan-name</i>	Name of the emulated LAN. Maximum length is 32 characters.
<i>atm-address</i>	LANE server's ATM address.
<b>restricted</b>   <b>un-restricted</b>	(Optional) Membership in the named emulated LAN is restricted to the LANE clients explicitly defined to the emulated LAN in the configuration server's database.
<b>index number</b>	(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: <ul style="list-style-type: none"> <li>• <b>un-restricted</b></li> <li>• <b>index</b></li> </ul>

### Usage Guidelines

Emulated LAN names must be unique within one named LANE configuration database.

Specifying an existing emulated LAN name with a new LANE server ATM address adds the LANE server ATM address for that emulated LAN 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 emulated LANs. The clients that can be assigned to the *eng* and *mkt* emulated LANs are specified using the **client-atm-address** commands. All other clients are assigned to the *man* emulated LAN.

```
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 39.000001415555121101020304.0800.200c.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
<b>client-atm-address name</b>	Adds a LANE client address entry to the configuration database of the configuration server.
<b>default-name</b>	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.
<b>lane database</b>	Creates a named configuration database that can be associated with a configuration server.
<b>mac-address</b>	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 submode 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

<i>ip-address</i>	IP address of the neighboring router.
<i>peer-group-name</i>	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 general command **no default bgp ipv4 activate**, or you can disable it for a particular neighbor using the **no** form of this command.

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

## Command Modes

Address family submode  
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 VPN IPv4 for all neighbors in the BGP peer group 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
<b>address-family</b>	Enters the address family submode for configuring routing protocols, such as BGP, RIP, and static routing.
<b>exit-address-family</b>	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

<i>ip-address</i>	IP address of the neighboring router.
<i>number</i>	(Optional) Specifies the number of times to allow the advertisement of a PE router's ASN. 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 Cisco IOS Release 12.1.

## 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:

- 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

<b>Command</b>	<b>Description</b>
<b>address-family</b>	Enters the address family submode used to configure routing protocols including 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**

<b>Syntax Description</b>	<i>ip-address</i>	Specifies the IP address of the router that is to be overridden with the ASN provided.
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<b>Defaults</b>	No default behavior or values.
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<b>Command Modes</b>	Router configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(7)T	This command was introduced.

<b>Usage Guidelines</b>	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.
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<b>Examples</b>	The following example shows how to configure a router to override the ASN of a site with the ASN of a provider:
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```
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
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>neighbor activate</b>	Enables the exchange of information with a BGP neighboring router.
	<b>neighbor remote-as</b>	Allows a neighboring router's IP address to be included in the BGP routing table.
	<b>neighbor update-source</b>	Allows internal BGP sessions to use any operational interface for TCP/IP connections.
	<b>route-map</b>	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 for network-id is 1), use the **no** form of this command.

**network-id** *id*

**no network-id**

<b>Syntax Description</b>	<i>id</i>	Specifies the network ID of the MPOA server.
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<b>Defaults</b>	The default value for network-id is 1.
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<b>Command Modes</b>	MPS configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.3(3a)WA4(5)	This command was introduced.

<b>Usage Guidelines</b>	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.
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<b>Examples</b>	The following example sets the network ID to 5:
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```
network-id 5
```

# next-address

To specify the next IP address in the explicit path, use the **next-address** command in IP explicit path subcommand mode.

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

<b>Syntax Description</b>	<i>A.B.C.D</i>	Specifies the IP address in the explicit path.
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<b>Defaults</b>	No default behavior or values.
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<b>Command Modes</b>	IP explicit path subcommand
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(5)S	This command was introduced.

**Examples** The following commands assign the number 60 to the IP explicit path, set the state of the path to be enabled, and specify 3.3.27.3 as the next IP address in the list of IP addresses.

```
configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
mpls traffic-eng tunnels
ip explicit-path identifier 60 enable
next-address 3.3.27.3
Explicit Path identifier 60:
  1: next-address 3.3.27.3
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>append-after</b>	Inserts a path entry after a specific index number.
	<b>index</b>	Inserts or modifies a path entry at a specific index.
	<b>ip explicit-path</b>	Enters the subcommand mode for IP explicit paths to create or modify the named path.
	<b>list</b>	Displays all or part of the explicit path or paths.
	<b>show ip explicit-paths</b>	Displays configured IP explicit paths.

# rd

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

**rd** *route-distinguisher*

<b>Syntax Description</b>	<i>route-distinguisher</i>	Adds an 8-byte value to an IPv4 prefix to create a VPN IPv4 prefix.
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**Defaults** There is no default. An RD must be configured for a VRF to be functional.

**Command Modes** VRF submode

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(5)T	This command was introduced.

**Usage Guidelines** A route distinguisher (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 either an ASN-relative, in which case it is composed of an autonomous system number and an arbitrary number, or it is IP-address-relative, 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
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>ip vrf</b>	Configures a VRF routing table.
	<b>show ip vrf</b>	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 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

<b>import</b>	Imports routing information from the target VPN extended community.
<b>export</b>	Exports routing information to the target VPN extended community.
<b>both</b>	Imports both import and export routing information to the target VPN extended community.
<i>route-target-ext-community</i>	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 submode

## 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. Execute 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 *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
<b>ip vrf</b>	Configures a VRF routing table.
<b>import map</b>	Configures an import route map for a VRF.

# set ip next-hop verify-availability

To configure policy routing to verify if the next hop(s) of a route map is a CDP neighbor(s) 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 hop(s) of the route map is the router's CDP neighbor(s) 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 test sequence 10, the subsequent packets of the same flow always take the same route map test sequence 10, not route map 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 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
	<b>router ospf</b>	Enables OSPF routing, which places you in the 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

<i>vlan-number</i>	Number identifying the VLAN.
<i>module</i>	Number of the module. This argument is not valid when defining or configuring Token Ring Bridge Relay Functions (TRBRFs).
<i>port</i>	Number of the port on the module belonging to the VLAN; this argument does not apply to TRBRFs.
<b>name</b> <i>name</i>	(Optional) Defines a text string used as the name of the VLAN (1 to 32 characters).
<b>type</b> { <b>ethernet</b>   <b>fddi</b>   <b>fddinet</b>   <b>trcrf</b>   <b>trbrf</b> }	(Optional) Identifies the VLAN type. The default type is Ethernet.
<b>state</b> { <b>active</b>   <b>suspend</b> }	(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.
<b>said</b> <i>said</i>	(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.
<b>mtu</b> <i>mtu</i>	(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.
<b>ring</b> <i>hex-ring-number</i>	(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.
<b>decring</b> <i>decimal-ring-number</i>	(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.
<b>bridge</b> <i>bridge-number</i>	(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.
<b>parent</b> <i>vlan-number</i>	(Optional) Sets a parent VLAN. The range for <i>vlan-number</i> is 2 to 1005. This argument identifies the TRBRF to which a TRCRF belongs and is required when defining a TRCRF.
<b>mode</b> { <b>srt</b>   <b>srb</b> }	(Optional) Specifies the TRCRF bridging mode.
<b>stp</b> { <b>ieee</b>   <b>ibm</b>   <b>auto</b> }	(Optional) Specifies the Spanning Tree Protocol version for a TRBRF to use: source-routing transparent ( <b>ieee</b> ), source-route bridging ( <b>ibm</b> ), or automatic source selection ( <b>auto</b> ).

<b>translation</b> <i>vlan-number</i>	(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.
<b>backuperf</b> {off   on}	(Optional) Specifies whether the TRCRF is a backup path for traffic.
<b>aremaxhop</b> <i>hop-count</i>	(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.
<b>stemaxhop</b> <i>hop-count</i>	(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.
	<i>1q-vlan-number</i>	Number identifying the 802.1Q VLAN; valid values are 1001 to 4095.
	<b>isl</b>	Specifies the ISL VLAN.
	<i>isl-vlan-number</i>	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**

<b>Command</b>	<b>Description</b>
<b>clear vlan mapping</b>	Deletes existing 802.1Q VLAN to ISL VLAN-mapped pairs.
<b>show vlans</b>	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**

<b>Syntax Description</b>	<i>count</i>	Shortcut-setup frame count. The default is 10 frames.
---------------------------	--------------	---

<b>Defaults</b>	The default is 10 frames.	
-----------------	---------------------------	--

<b>Command Modes</b>	MPC configuration mode.	
----------------------	-------------------------	--

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.3(3a)WA4(5)	This command was introduced.

<b>Examples</b>	The following example sets the shortcut-setup frame count to 5 for the MPC:	
	<code>shortcut-frame-count 5</code>	

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>atm-address</b>	Overrides the control ATM address of an MPC or MPS.
	<b>mpoa client config name</b>	Defines an MPC with a specified name.
	<b>shortcut-frame-time</b>	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**

<b>Syntax Description</b>	<i>time</i> (Optional) Shortcut-setup frame time in seconds.
---------------------------	--

<b>Defaults</b>	The default is 1 second.
-----------------	--------------------------

<b>Command Modes</b>	MPC configuration
----------------------	-------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.3(3a)WA4(5)	This command was introduced.

<b>Examples</b>	<p>The following example sets the shortcut-setup frame time to 7 for the MPC:</p> <pre>shortcut-frame-time 7</pre>
-----------------	--

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>atm-address</b>	Overrides the control ATM address of an MPC or MPS.
	<b>mpoa client config name</b>	Defines an MPC with a specified name.
	<b>shortcut-frame-count</b>	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 [detail]**

<b>Syntax Description</b>	<b>detail</b>	(Optional) Displays detailed adjacency information, including Layer 2 information.
---------------------------	---------------	--

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2 GS	This command was introduced to support the Cisco 12012 Gigabit Switch Router.
	11.1 CC	Multiple platform support was added.

<b>Usage Guidelines</b>	This command is available only on routers that have RP cards.
-------------------------	---

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

Table 3 describes the significant fields shown in the display.

**Table 3** *show adjacency detail Field Descriptions*

<b>Field</b>	<b>Description</b>
Protocol	The routed protocol to which the adjacency is related.
Interface	The outgoing interface associated with the adjacency.

**Table 3** *show adjacency detail Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
Address	<p>The address can represent one of these addresses:</p> <ul style="list-style-type: none"> <li>• Next Hop address</li> <li>• Point-to-Point address</li> </ul> <p>The number (in parentheses) that follows this field indicates the number of internal references to the adjacency.</p>
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**

<b>Command</b>	<b>Description</b>
<b>clear adjacency</b>	Clears CEF adjacency table.

## show atm vc

To display information about private ATM virtual circuits (VCs), use the **show atm vc** command in privileged EXEC mode.

```
show atm vc [vcd]
```

Private VCs exist on the control interface of a LSC to support corresponding VCs on an extended label ATM interface.

<b>Syntax Description</b>	<i>vcd</i>	(Optional) Specifies the virtual circuit about which to display information.
---------------------------	------------	--

<b>Command Modes</b>	Privileged EXEC
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(3)T	This command was introduced.

<b>Usage Guidelines</b>	VCs on the extended label ATM interfaces do not show up in the <b>show atm vc</b> command output. Instead, the <b>show xtagatm vc</b> command provides a similar output that shows information only on extended label ATM VCs.
-------------------------	--

<b>Examples</b>	In the following example, no VCD is specified and private VCs are present.
-----------------	--

```
show atm vc
```

Interface	VCD	VPI	VCI	Type	AAL / Encapsulation	Peak Kbps	Avg. Kbps	Burst 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

Table 4 lists the significant fields in this display.

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:

```
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 output.

**Table 4** show atm vc Field Descriptions

Field	Description
ATM1/0	Interface slot and number.
VCD	Virtual circuit descriptor (virtual circuit number).
VPI	Virtual path identifier.
VCI	Virtual circuit identifier.
etype	Ethernet type.
AAL5- XTAGATM	Type of ATM adaptation layer (AAL) and encapsulation. A private VC has AAL5 and encapsulation XTAGATM.
Flags	Bit mask describing virtual circuit 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

**Table 4** *show atm vc Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
PeakRate	Number of packets transmitted at the peak rate.
Average Rate	Number of packets transmitted at the average rate.
Burst Cells	Value that, when multiplied by 32, equals the maximum number of ATM cells the virtual circuit can transmit at the peak rate of the virtual circuit.
VCmode	AIP-specific or NPM-specific register describing the usage of the virtual circuit. Contains values such as rate queue, peak rate, and AAL mode, which are also displayed in other fields.
xtagatml	Interface of corresponding extended label ATM VC.
VCD	Virtual circuit descriptor (virtual circuit number) of the corresponding extended label ATM VC.
VPI	Virtual path identifier of the corresponding extended label ATM VC.
VCI	Virtual channel identifier of the corresponding extended label ATM VC.
OAM frequency	Seconds between OAM loopback messages or DISABLED if OAM is not in use on this VC.
InARP frequency	Minutes between InARP messages, or DISABLED if InARP is not in use on this VC.
InPkts	Total number of packets received on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-switched, and process-switched packets.
OutPkts	Total number of packets sent on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-switched, and process-switched packets.
InBytes	Total number of bytes received on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-switched, and process-switched packets.
OutBytes	Total number of bytes sent on this virtual circuit. This number includes all silicon-switched, fast-switched, autonomous-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.
OutFast	Number of fast-switched output packets.
InAS	Number of autonomous-switched or silicon-switched input packets.
OutAS	Number of autonomous-switched or silicon-switched output packets.
OAM F5 cells sent	Number of OAM cells sent on this virtual circuit.
OAM cells received	Number of OAM cells received on this virtual circuit.
Status	Displays the current state of the specified ATM interface.

# show cef

To display which packets the line cards dropped or to display which packets were not express forwarded, use the **show cef** command in EXEC mode.

**show cef** [**drop** | **not-cef-switched**]

Syntax Description	drop	(Optional) Displays which packets were dropped by each line card.
	<b>not-cef-switched</b>	(Optional) Displays which packets were sent to a different switching path.

**Command Modes** EXEC

Command History	Release	Modification
	11.2 GS	This command was introduced to support the Cisco 12012 Gigabit Switch Router.
	11.1 CC	Multiple platform support was added.

## Usage Guidelines

This command is available only on routers that have RSP cards.

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 Cisco Express Forwarding (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.

## Examples

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

```
show cef drop
```

```
CEF Drop Statistics
Slot  Encap_fail  Unresolved  Unsupported  No_route  No_adj  ChksumErr
RP
1      0             0           0           0         0       0
2      0             0           5           0         0       5
```

Table 5 describes the fields shown in the output.

**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 1 packet per second.)

**Table 5** *show cef drop Field Descriptions (continued)*

Field	Description
Unresolved	Indicates the number of packets dropped due to unresolved prefix in the FIB table.
Unsupported	Indicates the number of packets fast dropped by CEF. (drop adjacency)
No_route	Indicates the number of packets dropped due to missing prefix in the FIB table.
No_adj	Indicates the number of packets dropped due to incomplete adjacency.
ChksumErr	Indicates the number of packets received with a checksum error.

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

```
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
```

Table 6 describes the fields shown in the output.

**Table 6** *show cef not-cef-switched Field Descriptions*

Field	Meaning
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 ARP resolution.
Unsupp'ted	Indicates the number of packets punted to the next switching level due to unsupported features.
Redirect	Indicates the number of packets punted to the processor to generate an ICMP redirect.
Receive	Indicates the number of packets destined to the router. These packets are process switched.
Options	Indicates the number of packets with options. Packets with IP options are only handled at the process level.
Access	Indicates the number of packets punted due to access-list failure.
Frag	Indicates the number of packets punted due to fragmentation failure.

**Related Commands**

Command	Description
<b>show cef interface</b>	Displays CEF-related interface information.
<b>show cef linecard</b>	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*]

<b>Syntax Description</b>	<i>type number</i>	(Optional) Displays detailed CEF information for the specified interface type and number.
---------------------------	--------------------	---

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2 GS	This command was introduced to support the Cisco 12012 Gigabit Switch Router.
	11.1 CC	Multiple platform support was added.

<b>Usage Guidelines</b>	<p>This command is available on routers that have RP cards and line cards.</p> <p>You can use this command to show the detailed CEF status for all of the interfaces.</p> <p>The <i>type number</i> keywords display CEF status information for the specified interface type and number.</p>
-------------------------	--

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

```
Router>show cef interface FastEthernet 0/0

FastEthernet0/0 is up (if_number 3)
  Internet address is 172.19.177.20/24
  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 FastEthernet0/0
  Fast switching type 1, interface type 18
  IP CEF switching enabled
  IP Fast switching turbo vector
  IP Feature CEF switching turbo vector
  Input fast flags 0x0, Output fast flags 0x0
  ifindex 1(1)
  Slot 0 Slot unit 0 VC -1
  Transmit limit accumulator 0x0 (0x0)
  IP MTU 1500
```

Table 7 describes the fields shown in the output.

**Table 7** show cef interface detail Field Descriptions

Field	Description
<i>interface type number</i> is {up   down}	Indicates type, number and status of the interface.
Internet address is	Internet address of the interface.
ICMP redirects are {always sent   never sent}	Indicates how packet forwarding is configured.
Per packet load-sharing is {enabled   disabled}	Indicates status of load-sharing on the interface.
IP unicast RPF check is {enabled   disabled}	Indicates status of IP unicast 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 {enabled   disabled}	Indicates the status of IP policy routing on the interface.
Hardware idb is <i>type number</i>	Interface type and number configured.
Fast switching type	Used for troubleshooting; indicates switching mode in use.
<i>interface type number</i>	Indicates interface type.
IP CEF switching {enabled   disabled}	Indicates status of IP CEF switching on the interface.
IP Fast switching <i>type</i>	Indicates IP Fast switching type configured.
IP Feature CEF switching <i>type</i>	Indicates IP Feature CEF switching type configured.

**Table 7** *show cef interface detail Field Descriptions (continued)*

Field	Description
Input fast flags <i>n X n</i>	Indicates the input status of various switching features: <ul style="list-style-type: none"> <li>• 0x0001 (input ACL enabled)</li> <li>• 0x0002 (policy routing enabled)</li> <li>• 0x0004 (input rate limiting)</li> <li>• 0x0008 (MAC/Prec accounting)</li> <li>• 0x0010 (DSCP/PREC/QOS GROUP)</li> <li>• 0x0020 (input named access lists)</li> <li>• 0x0040 (NAT enabled on input)</li> <li>• 0x0080 (crypto map on input)</li> <li>• 0x0100 (QPPB classification)</li> <li>• 0x0200 (inspect on input)</li> <li>• 0x0400 (input classification)</li> <li>• 0x0800 (input stile classify)</li> <li>• 0x2000 (input idle timer enabled)</li> <li>• 0x4000 (unicast RPF check)</li> <li>• 0x8000 (WCCP redirect on input)</li> <li>• 0x00010000 (URL RenDezvous)</li> </ul>
Output fast flags <i>n X n</i>	Indicates the output status of various switching features: <ul style="list-style-type: none"> <li>• 0x0001 (output ACL enabled)</li> <li>• 0x0002 (IP accounting enabled)</li> <li>• 0x0004 (WCC redirect enable i/f)</li> <li>• 0x0008 (rate limiting)</li> <li>• 0x0010 (MAC/Prec accounting)</li> <li>• 0x0020 (DSCP/PREC/QOS GROUP)</li> <li>• 0x0040 (D-QOS classification)</li> <li>• 0x0080 (output named access lists)</li> <li>• 0x0100 (NAT enabled on output)</li> <li>• 0x0200 (TCP intercept enabled)</li> <li>• 0x0400 (crypto map set on output)</li> <li>• 0x0800 (inspect on output)</li> <li>• 0x1000 (output classification)</li> <li>• 0x2000 (output stile classify)</li> </ul>
ifindex <i>n(n)</i>	Indicates the SNMP ifindex for this interface.

**Table 7** *show cef interface detail Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
IP Distributed CEF switching {enabled   disabled} (7500 and 12000 Series only)	Indicates whether distributed CEF is enabled on this interface.
Slot <i>n</i> Slot unit <i>n</i>	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**

<b>Command</b>	<b>Description</b>
<b>show cef</b>	Displays which packets the line cards dropped or displays which packets were not express-forwarded.
<b>show cef linecard</b>	Displays CEF-related interface information by line card.

# show cef linecard

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

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

Syntax Description		
	<i>slot-number</i>	(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.
	<b>detail</b>	(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 Gigabit Switch Router.
	11.1 CC	Multiple platform support was added.

## Usage Guidelines

This command is available only on routers that have RP cards.

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** command. The command displays information for the line cards.

```
show cef linecard

CEF table version 115705, 45877 routes
Slot CEF-ver MsgSent XdrSent Seq MaxSeq LowQ HighQ Flags
1      238      668      9641 616      616      0      0 up, sync
2      238      683     10782 619      629      0      0 up, sync
```

Table 8 describes the fields shown in the output.

**Table 8** *show cef linecard* Field Descriptions

Field	Description
CEF table version	The FIB table version.
XdrSent	IPC information elements (xdrs) packed into IPC messages sent from the RP to the line card.

**Table 8** show cef linecard Field Descriptions (continued)

Field	Description
MsgSent	Number of IPC messages sent.
Seq	Sequence number for the line card.
MaxSeq	Maximum sequence expected by the line card.
LowQ/HighQ	Number of xdr elements in LowQ and HighQ.
Flags	Indicates the status of the line card. Possible states are the following: <ul style="list-style-type: none"> <li>• upLine card is up.</li> <li>• syncLine card is in sync with main FIB.</li> <li>• repopulateRepopulate FIB on line card.</li> <li>• resetLine card FIB is reset.</li> <li>• reloadingLine card FIB is currently being reloaded.</li> <li>• disabledLine card is disabled.</li> </ul>

The following is sample output from the **show cef linecard detail** command for the line card in slot number 2:

```
show cef linecard 2 detail

CEF line card slot number 2, status up, sync, disabled
line card CEF version number 238
Sequence number 616, Maximum sequence number expected 616
Send failed 0, Out Of Sequence 0
line card CEF reset 2, reloaded 2
92299/15/91 prefix/adjacency/interface elements queued
49641 elements packed in 668 messages(1341286 bytes) sent
0/0 xdr elements in LowQ/HighQ
Input packets 0, bytes 0<--- line card stats
Output packets 0, bytes 0, drops 0
```

**Related Commands**

Command	Description
<b>show cef</b>	Displays which packets the line cards dropped or displays which packets were not express-forwarded.
<b>show cef interface</b>	Displays CEF-related interface information.

# show controllers vsi control-interface

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

**show controllers vsi control-interface** [*interface*]

<b>Syntax Description</b>	<i>interface</i> (Optional) Interface number.
---------------------------	---

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(3)T	This command was introduced.

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

```
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 LSC through VSI over the control interface.

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>tag-control-protocol vsi</b>	Configures the use of VSI on a particular master control port.

# show controllers vsi descriptor

To display information about a switch interface discovered by the LSC through VSI, or, if no descriptor is specified, about all such discovered interfaces, use the **show controllers vsi descriptor** command in EXEC mode. You specify an interface by its (switch-supplied) physical descriptor.

**show controllers vsi descriptor** [*descriptor*]

## Syntax Description

*descriptor* (Optional) Physical descriptor. For the BPX, the physical descriptor has the following form:

*slot.port.0*

## Command Modes

EXEC

## Command History

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

## Usage Guidelines

Per-interface information includes the interface name, the physical descriptor, the interface status, the physical interface state (supplied by the switch), acceptable VPI/VCI ranges, maximum cell rate, available cell rate (forward/backward), and available channels.

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

## Examples

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

```
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 9 lists the significant fields in this display.

**Table 9** *show controllers vsi descriptor* Field Description

Field	Description
Phys desc	Physical descriptor. A string learned from the switch that identifies the interface.
Log intf	Logical interface ID. This 32-bit quantity, learned from the switch, uniquely identifies the interface.

**Table 9** *show controllers vsi descriptor Field Description (continued)*

Field	Description
Interface	The (IOS) interface name.
IF Status	The overall interface status. May 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 channel identifier. Indicates the low end of the VCI 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	The operational state of the interface, according to the switch. One of FAILED_EXT (that is, in external alarm), FAILED_INT (indicates the inability of the LSC to communicate with the VSI slave controlling the interface, or another internal failure), or REMOVED administratively (removed on the switch).
Maximum cell rate	The 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)	The cell rate that is currently available in the forward (that is, ingress) direction for new cross-connects on the interface.
Available cell rate (backward)	The cell rate that is currently available in the backward (that is, egress) direction for new cross-connects on the interface.

**Related Commands**

Command	Description
<b>show controllers XTagATM</b>	Displays information about an extended label ATM interface or, if an interface is not specified, about all extended label ATM interfaces, that are controlled through the VSI protocol.

# show controllers vsi session

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



**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 may be multiple VSI slaves for a switch. On the BPX, each port or trunk card assumes the role of a VSI slave.

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

**Syntax Description**

<i>session-num</i>	Session number.
<b>interface</b> <i>interface</i>	VSI control interface.

**Command Modes**

EXEC

**Command History**

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

**Usage Guidelines**

If a session number and an interface are specified, detailed information about the individual session is presented. If the session number is specified but the interface is omitted, detailed information about all sessions having that number is presented. (Only one session can have a given number in the first release, as multiple control interfaces are not supported.)

**Examples**

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

```
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 10 lists the significant fields in this display.

**Table 10** *show controllers vsi session Field Descriptions*

Field	Description
Interface	Control interface name.
Session	Session number (from 0 to <n-1>), where <i>n</i> is the number of sessions on the control interface.
VCD	Virtual circuit descriptor (virtual circuit number). Identifies the VC that carries the VSI protocol between the master and the slave for this session.
VPI/VCI	Virtual path identifier/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:  CONFIGURING RESYNC_STARTING RESYNC_UNDERWAY RESYNC_ENDING DISCOVERY SHUTDOWN_STARTING SHUTDOWN_ENDING INACTIVE

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

```
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 11 lists the significant fields in this display.

**Table 11** *show controllers vsi session (with Session Number 9 Specified) 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 <i>n</i> is the number of slaves. Configured on the LSC with the <b>slaves</b> option of the <b>tag-control-protocol vsi</b> command.

**Table 11** *show controllers vsi session (with Session Number 9 Specified) Field Descriptions*

<b>Field</b>	<b>Description</b>
VCD	Virtual circuit descriptor (virtual circuit number). Identifies the VC that carries VSI protocol messages for this session.
VPI/VCI	Virtual path identifier/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 with the <b>id</b> option of the <b>label-control-protocol vsi</b> command, and also configured on the switch.
Slave id	Slave identifier (supplied by the switch).
Keepalive timer	VSI master keepalive timeout period, in seconds. Configured on the LSC through the <b>keepalive</b> option of the <b>tag-control-protocol vsi</b> command. If no valid message is received by the LSC within this period of time, the LSC sends a keepalive message to the slave.
Powerup session id	The session id (supplied by the slave) that it used at power-up 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 <b>retry</b> option of the <b>tag-control-protocol vsi</b> 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	The session ID for the currently active session (supplied by the slave).
Max retries	The 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 LSC through the <b>retry</b> option of the <b>tag-control-protocol vsi</b> command.
Ctrl port log intf	The logical interface identifier for the control port, as supplied by the switch.
Trap window	The maximum number of outstanding trap messages permitted by the master. This is advertised, but not enforced, by the LSC.
Max/actual cmd wndw	The 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 actual command window is the maximum number of outstanding commands that are permitted by the master, before it waits for acknowledgments. This number is always less than the maximum command window.
Trap filter	This is always “all” for the LSC, indicating that it wishes to receive all traps from the slave. This is communicated to the slave by the master.
Max checksums	The maximum number of checksum blocks supported by the slave. (In this release, the LSC uses only one checksum block.)

**Table 11** *show controllers vsi session (with Session Number 9 Specified) Field Descriptions*

Field	Description
Current VSI version	The VSI protocol version currently in use by the master for this session. (In the first release, this is always 1.)
Min/max VSI version	The 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	The number of commands sent to the slave.
Inter-Slave timer	<p>The timeout value associated by the slave for messages it sends to other slaves.</p> <p>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.</p> <p>Note that in order for the LSC VSI implementation to function properly, the value of its retry timer is forced to be at least twice the value of the inter-slave timer. (See “Cfg/act retry timer”).</p>
Messages received	The number of responses and traps received by the master from the slave for this session.
Messages outstanding	The current number of outstanding messages (that is, commands sent by the master for which responses have not yet been received).

**Related Commands**

Command	Description
<b>tag-control-protocol vsi</b>	Configures the use of VSI on a particular master control port.

# show controllers vsi status

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

**show controllers vsi status**

**Syntax Description** This command has no arguments or keywords.

**Command Modes** EXEC

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

**Usage Guidelines** If an interface has been discovered by the LSC, but no extended label 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:

```
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 12 lists the significant fields in this display.

**Table 12** *show controllers vsi status Command Field Descriptions*

Field	Description
Interface Name	The (IOS) interface name.
IF Status	The overall interface status. May be “up”, “down”, or “administratively down.”
IFC State	The operational state of the interface, according to the switch. One of FAILED_EXT (that is, in external alarm), FAILED_INT (indicates the inability of the LSC to communicate with the VSI slave controlling the interface, or another internal failure), or REMOVED (administratively removed on 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** command in EXEC mode.

```
show controllers vsi traffic [{descriptor descriptor | session session-num |
vc [descriptor descriptor [vpi vci ]]]]
```

Syntax Description	Parameter	Description
	<b>descriptor</b> <i>descriptor</i>	(Optional) Specifies the interface.
	<b>session</b> <i>session-num</i>	(Optional) Specifies session number.
	<i>vpi</i>	(Optional) Virtual path identifier.
	<i>vci</i>	(Optional) Virtual circuit identifier.

**Command Modes** EXEC

Command History	Release	Modification
	12.0(3)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** command.

**Examples**

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

```
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 13 lists the significant fields in this display.

**Table 13** show controllers vsi traffic Field Descriptions

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

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

```
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 14 lists the significant fields in this display.

**Table 14** 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.

**Table 14** *show controllers vsi traffic session Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
Sw Cnfg Trap	Number of VSI “switch configuration asynchronous trap” messages received.
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	<p>“Unused” messages are those whose function codes are recognized as being part of the VSI protocol, but which are not used by the LSC, and consequently are not expected to be received or sent.</p> <p>“Unknown” messages have function codes that the LSC does not recognize as part of the VSI protocol.</p>
TOTAL	Total number of VSI messages sent or received.

# show controllers XTagATM

To display information about an extended label ATM interface or, if an interface is not specified, about all extended label ATM interfaces, that are controlled through the VSI protocol, use the **show controllers XTagATM** command in EXEC mode.

**show controllers XTagATM** *if-num*

<b>Syntax Description</b>	<i>if-num</i>	Interface number.
---------------------------	---------------	-------------------

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(3)T	This command was introduced.

**Usage Guidelines** Per-interface information includes the interface name, the physical descriptor, the interface status, the physical interface state (supplied by the switch), acceptable VPI/VCI ranges, maximum cell rate, available cell rate (forward/backward), and available channels.

Similar information is displayed when you enter the **show controllers vsi descriptor** command. However, you must specify an interface by its (switch-supplied) physical descriptor, instead of its IOS interface name. For the BPX, 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.

```
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 15 lists the significant fields in this display.

**Table 15** show controllers XTagATM Field Descriptions

Field	Description
Interface XTagATM is up	Indicates the overall status of the interface. May be “up”, “down”, or “administratively down.”
Hardware is Label-Controlled ATM Port	Indicates the hardware type. If the XTagATM interface has been 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 “name” is an identifying string learned from the switch.  If the XTagATM interface has not been bound to a switch interface (with the <b>extended-port</b> 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 has been bound (with the <b>extended-port</b> interface configuration command) to the VSI master whose control interface is ATM1/0 and that this control interface is up.
Physical descriptor is ...	The physical descriptor is a string identifying the interface that has been learned from the switch.
Logical interface	This 32-bit quantity, learned from the switch uniquely identifies the interface. It is displayed in both hexadecimal and dotted quad notation.
Oper state	The operational state of the interface, according to the switch. One of ACTIVE, FAILED_EXT (that is, in external alarm), FAILED_INT (indicates the inability of the LSC to communicate with the VSI slave controlling the interface, or another internal failure), or REMOVED (administratively removed on the switch).
admin state	The administrative state of the interface, according to the switch—UP or DOWN.
VPI range 1-255	Indicates the allowable VPI range for the interface that has been configured on the switch.
VCI range 32-65535	Indicates the allowable VCI range for the interface that has been configured on or determined by the switch.
Label control VC need not be strictly in VPI/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:	The maximum cell rate for the interface, which has been configured on the switch.

**Table 15** show controllers XTagATM Field Descriptions (continued)

Field	Description
Available cell rate:	The cell rate that is currently available for new cross-connects on the interface.
Endpoints in use:	The number of endpoints (channels) in use on the interface, broken down by anticipated traffic flow: <ul style="list-style-type: none"> <li>• Ingress—endpoints carry traffic into the switch</li> <li>• Egress—endpoints carry traffic away from the switch</li> <li>• Ingress/egress—endpoints carry traffic in both directions.</li> </ul>
Rx cells	The number of cells received on the interface.
rx cells discarded	The number of cells received on the interface that were discarded on account of traffic management actions. rx header errors.
rx header errors	The number of cells received on the interface having cell header errors.
rx invalid addresses (per card)	The number of cells received with invalid addresses (that is, unexpected VPI/VCI.) On the BPX, this counter is maintained per port group (not per interface.)
last invalid address	The address of the last cell received on the interface with an invalid address (for example, 0/32).
Tx cells	The number of cells transmitted out the interface.
tx cells discarded	The number of cells intended for transmission out the interface that were discarded due to traffic management actions.

**Related Commands**

Command	Description
<b>show controllers vsi descriptor</b>	Displays information about a switch interface discovered by the LSC through VSI, or, if no descriptor is specified, about all such discovered interfaces.

# 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:

```
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 16 describes the fields in the display.

**Table 16** *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 16** *show interface stats Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
Pkts Out	Number of packets sent out each switching mechanism.
Chars Out	Number of characters sent out each switching mechanism.

