



## set port flowcontrol through show uddl

---

- [service instance trunk](#), on page 3
- [set port flowcontrol](#), on page 5
- [set vlan](#), on page 7
- [set vlan mapping](#), on page 10
- [show](#), on page 12
- [show controllers fastethernet](#), on page 14
- [show cwan](#), on page 25
- [show cwan qinq](#), on page 27
- [show cwan qinq bridge-domain](#), on page 30
- [show cwan qinq interface](#), on page 33
- [show cwan qinq load-balance](#), on page 37
- [show cwan qinq port-channel](#), on page 40
- [show cwtlc qinq](#), on page 42
- [show dot1q-tunnel](#), on page 46
- [show errdisable flap-values](#), on page 47
- [show gvrp interface](#), on page 49
- [show gvrp summary](#), on page 50
- [show mac-address-table](#), on page 51
- [show mac-address-table aging-time](#), on page 62
- [show mac-address-table dynamic](#), on page 64
- [show mac-address-table learning](#), on page 68
- [show mac-address-table static](#), on page 72
- [show mls df-table](#), on page 76
- [show mls masks](#), on page 78
- [show mls rp](#), on page 80
- [show mls rp interface](#), on page 82
- [show mls rp ip multicast](#), on page 83
- [show mls rp ipx](#), on page 86
- [show mls rp vtp-domain](#), on page 88
- [show mmls igmp explicit-tracking](#), on page 90
- [show mmls msc](#), on page 91
- [show mvr](#), on page 97
- [show mvr groups](#), on page 99

- [show mvr interface](#), on page 101
- [show mvr members](#), on page 103
- [show mvr receiver-ports](#), on page 105
- [show mvr source-ports](#), on page 107
- [show mvrp interface](#), on page 109
- [show mvrp module](#), on page 110
- [show mvrp summary](#), on page 111
- [show platform software status control-processor](#), on page 112
- [show port flowcontrol](#), on page 116
- [show rep topology](#), on page 118
- [show spanning-tree](#), on page 121
- [show spanning-tree mst](#), on page 133
- [show spantree](#), on page 138
- [show ssl-proxy module state](#), on page 141
- [show udd](#), on page 142

## service instance trunk

To configure the Resilient Ethernet Protocol (REP) on a Trunk Ethernet Flow Point (EFP) on an Ethernet interface, use the **service instance trunk** command in service instance configuration mode. To remove the configuration, use the **no** form of the command.

**service instance trunk** *service-instance-identifier* **ethernet**

**no service instance trunk**

Syntax Description	
<i>service-instance-identifier</i>	Unique identifier of the service instance of an Ethernet interface. The valid range is from 1 to 8000.
<b>ethernet</b>	Configures an Ethernet interface instance.

**Command Default** This command is enabled by default.

**Command Modes** Service instance configuration (config-if-srv)

Command History	Release	Modification
	Cisco IOS XE Release 3.5S	This command was introduced on the Cisco ASR 903 Router.

**Usage Guidelines** The **service instance trunk** command enables REP support on Trunk EFP on the Cisco ASR 903 Router.

### Examples

The following example shows how to configure the Resilient Ethernet Protocol (REP) on a Trunk EFP on an Ethernet interface:

```
Router> enable
Router# configure terminal
Router(config)# interface GigabitEthernet0/0/1
Router(config-if)# service instance trunk 1 ethernet
Router(config-if-srv)# encapsulation dot 1 q vlan range
Router(config-if-srv)# rewrite ingress tag pop 1 symmetric
Router(config-if-srv)# bridge-domain from-encapsulation
Router(config-if-srv)# end
Router# configure terminal
Router(config)# interface GigabitEthernet0/0/1
Router(config-if)# rep segment 1 preferred
Router(config-if)# rep stcn stp
Router(config-if)# rep block port neighbor-offset
Router(config-if)# rep preempt delay seconds
Router(config-if)# end
```

Related Commands	Command	Description
	<b>bridge-domain from encapsulation</b>	Derives bridge domains from encapsulation.

Command	Description
<b>rewrite ingress tag pop</b>	Specifies the encapsulation adjustment that is to be performed on the frame ingress to the service instance.

# set port flowcontrol

To set the receive flow-control value for a particular Gigabit Ethernet switching module port, use the **setportflowcontrol** command in privileged EXEC mode. To reset the receive flow-control value to the default, use the no form of this command.

```
set port flowcontrol {receive | send} [{module-numberport-number}] {off | on | desired}
no set port flowcontrol {receive | send} [{module-numberport-number}] {off | on | desired}
```

## Syntax Description

<b>receive</b>	Indicates whether the port can receive administrative status from a remote device.
<b>send</b>	Indicates whether the local port can send administrative status to a remote device.
<i>module-number</i>	(Optional) Number of the module.
<i>port-number</i>	(Optional) Number of the port on the module.
<b>off</b>	When used with <b>receive</b> , it turns off an attached device's ability to send flow-control packets to a local port. When used with <b>send</b> , it turns off the local port's ability to send administrative status to a remote device.
<b>on</b>	When used with <b>receive</b> , it requires that a local port receive administrative status from a remote device. When used with <b>send</b> , the local port sends administrative status to a remote device.
<b>desired</b>	When used with <b>receive</b> , it allows a local port to operate with an attached device that is required to send flow-control packets or with an attached device that is not required to, but may send flow-control packets. When used with <b>send</b> , the local port sends administrative status to a remote device if the remote device supports it.

## Command Default

receive--off send--desired

Default on multiplexed ports is **on**. The exception to these defaults applies to the 18-port Gigabit Ethernet switching module. For this module, the defaults are shown below:

- Ports 1-2--send is off and receive is desired
- Ports 3-18--send is on and receive is desired

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.2(11)T	This command was introduced and implemented on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.

## Usage Guidelines

This command is supported only on Gigabit Ethernet switching modules.

## Examples

The following examples show how to use the **setportflowcontrol** command set.

The following example show how to set the port 5/1 flow-control receive administration status to **on** (port requires far end to send flow-control packets):

```
Router#setportflowcontrolreceive51on
```

The following example show how to set the port 5/1 flow-control receive administration status to **desired** (port allows far end to send flow-control packets if far end supports it):

```
Router# setportflowcontrolreceive51desired
```

The following example show how to set the port 5/1 flow-control receive administration status to **off** (port does not allow far end to send flow-control packets):

```
Router# setportflowcontrolreceive51off
```

The following example show how to set port 5/1 flow-control send administration status to **on** (port sends flow-control packets to far end):

```
Router# setportflowcontrolsend51on
```

The following example show how to set port 5/1 flow-control send administration status to **desired** (port sends flow-control packets to far end if far end supports it):

```
Router# setportflowcontrolsend5/1desired
```

The following example show how to set port 5/1 flow-control send administration status to **off** (port does not send flow-control packets to far end):

```
Router# setportflowcontrolsend51off
```

## Related Commands

Command	Description
<b>show port flowcontrol</b>	Displays per-port status information and statistics related to flow control.

## set vlan

To group ports into a virtual LAN (VLAN), use the **setvlan***vlan-numbermodule/port* command in privileged EXEC mode.

**set vlan** *vlan-numbermodule/port*

**set vlan** *vlan-number* [**name** *name*] [**type** {**ethernet** | **fddi** | **fddinet** | **trcrf** | **trbrf**}] [**state** {**active** | **suspend**}] [**sa-id** *sa-id*] [**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
<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>sa-id</b> <i>sa-id</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. T
<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
<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 you define 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 you define 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
<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 you define a TRCRF.
<b>mode</b> { <b>srt</b>   <b>srb</b> }	(Optional) Specifies the TRCRF bridging mode.

<b>stp</b> { <i>ieee</i>   <i>ibm</i>   <i>auto</i> }	(Optional) Specifies the Spanning Tree Protocol version for a TRBRF to use: source-routing transparent ( <i>ieee</i> ), source-route bridging ( <i>ibm</i> ), or automatic source selection ( <i>auto</i> ).
<b>translation</b> <i>vlan-number</i>	(Optional) Specifies a 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>backupcrf</b> { <i>off</i>   <i>on</i> }	(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 valid only when you define or configure 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 valid only when you define or configure TRCRFs.

**Command Default**

The default configuration has all switched Ethernet ports and Ethernet repeater ports in VLAN 1. Additional defaults are:

- SAID: 100001 for VLAN 1, 100002 for VLAN 2, 100003 for VLAN 3, and so on
- Type: Ethernet
- MTU: 1500 bytes
- State: Active

Defaults for TRBRFs and TRCRFs are:

- TRBRF : 1005
- TRCRF: 1003
- MTU for TRBRFs and TRCRFs : 4472.
- State: Active.
- **aremaxhop**: 7
- **stemaxhop**: 7.

**Command Modes**

Privileged EXEC (#)

**Command History**

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

**Usage Guidelines**

You cannot use the **setvlan** command until the networking device is in Virtual Trunking Protocol (VTP) transparent mode (**setvtpmode**) or until a VTP domain name has been set (**setvtp**).



Valid MTU values for a Token Ring VLAN are 1500 or 4472. You can enter any value but it 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 you add a new VLAN, the VLAN number must be within the range of 2 to 1001. When you modify 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
<b>clear vlan</b>	Deletes an existing VLAN from a management domain.
<b>show vlans</b>	Displays VLAN subinterfaces.

# set vlan mapping

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

```
set vlan mapping dot1q lq-vlan-number isl isl-vlan-number
```

Syntax Description	Parameter	Description
	<b>dot1q</b>	Specifies the 802.1Q VLAN.
	<i>lq-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.

**Command Default** No 802.1Q-to-ISL mappings are defined.

**Command Modes** Privileged EXEC (#)

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

**Usage Guidelines** 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. If you map an 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 terminated. 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 is given indicating that the VLAN does not exist.

If the table is full, the command is terminated 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
<b>clear vlan mapping</b>	Deletes existing 802.1Q VLAN to ISL VLAN-mapped pairs.
<b>show vlans</b>	Displays VLAN subinterfaces.

# show

To verify the Multiple Spanning Tree (MST) configuration, use the **show** command in MST configuration mode.

**show** [{**current** | **pending**}]

## Syntax Description

<b>current</b>	(Optional) Displays the current configuration that is used to run MST.
<b>pending</b>	(Optional) Displays the edited configuration that will replace the current configuration.

## Command Default

This command has no default settings.

## Command Modes

MST configuration (config-mst)

## Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

## Usage Guidelines

The display output from the **showpending** command is the edited configuration that will replace the current configuration if you enter the **exit** command to exit MST configuration mode.

Entering the **show** command with no arguments displays the pending configurations.

## Examples

This example shows how to display the edited configuration:

```
Router(config-mst)# show pending
Pending MST configuration
Name      [zorglub]
Version   31415
Instance  Vlans Mapped
-----
0         4001-4096
2         1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110
          1120
3         1-1009, 1011-1019, 1021-1029, 1031-1039, 1041-1049, 1051-1059
          1061-1069, 1071-1079, 1081-1089, 1091-1099, 1101-1109, 1111-1119
          1121-4000
-----
Router(config-mst)#
```

This example shows how to display the current configuration:

```
Router(config-mst)# show current
Current MST configuration
Name []
Revision 0
Instance Vlans mapped
-----
```

0 1-4094  
-----**Related Commands**

<b>Command</b>	<b>Description</b>
<b>instance</b>	Maps a VLAN or a set of VLANs to an MST instance.
<b>name (MST configuration submode)</b>	Sets the name of an MST region.
<b>revision</b>	Sets the revision number for the MST configuration.
<b>show spanning-tree mst</b>	Displays the information about the MST protocol.
<b>spanning-tree mst configuration</b>	Enters MST-configuration submode.

# show controllers fastethernet

To display information about initialization block, transmit ring, receive ring, Fast Ethernet interface information, applicable MAC destination address and VLAN filtering tables, and errors for the Fast Ethernet controller chip, use the **showcontrollersfastethernet** command in user EXEC or privileged EXEC mode.

## Standard Syntax

```
show controllers fastethernet number
```

## Cisco 7200 Series

```
show controllers fastethernet slot/port
```

## Cisco 7500 Series

```
show controllers fastethernet slot/port-adaptor/port
```

## Shared Port Adapter

```
show controllers fastethernet slot/sub-slot/port{[detail]}
```

### Syntax Description

<i>number</i>	Port, connector, or interface card number. On a Cisco 4500 or Cisco 4700 router, specifies the network processor module (NPM) number. The numbers are assigned at the factory at the time of installation or when added to a system.
<i>slot</i>	Slot number. Refer to the appropriate hardware manual for slot information.
<i>/ port</i>	Port number. Refer to the appropriate hardware manual for port information.
<i>/ port-adaptor</i>	Port adaptor number. Refer to the appropriate hardware manual for information about port adaptor compatibility.
<i>subslot</i>	(Optional) Secondary slot number on a jacket card where a SPA is installed.
<b>detail</b>	Specifies display of additional low-level diagnostic information.

### Command Modes

User EXEC (>) Privileged EXEC (#)

### Command History

Release	Modification
11.2	This command was introduced.
12.2S	This command was integrated into Cisco IOS Release 12.2S.
12.2(20)S2	This command was implemented on the 4-Port 10/100 Fast Ethernet SPA on the Cisco 7304 router and introduced a new address format and output.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

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

### Usage Guidelines

The output from this command is generally useful for diagnostic tasks performed by technical support.

#### Shared Port Adapter Usage Guidelines

The output from the **showcontrollersfastethernet** command for the 4-Port 10/100 Fast Ethernet SPA provides several different sections of information and statistics that are organized according to the internal hardware devices and the various paths in the flow of data on the SPA. The following sections are provided:

Several areas of the output are generally useful for diagnostic tasks performed by Cisco Systems technical support personnel only.

### Examples

The following is a sample output from the **showcontrollersfastethernet** command on a Cisco 4500 series router:

```
Router# show controllers fastethernet 0
DEC21140 Slot 0, Subunit 0
dec21140_ds=0x60001234, registers=0x3c001000, ib=0x42301563, ring entries=256
rxring=0x40235878, rxr shadow=0x64528745, rx_head=0, rx_tail=10
txring=0x43562188, txr shadow=0x65438721, tx_head=17, tx_tail=34, tx_count=17
DEC21140 Registers
CSR0=0x23457667, CSR3=0x12349878, CSR4=0x34528745, CSR5=0x76674565
CSR6=0x76453676, CSR7=0x76456574, CSR8=0x25367648, CSR9=0x87253674
CSR11=0x23456454, CSR12=0x76564787, CSR15=0x98273465
DEC21140 PCI registers
bus_no=0, device_no=0
CFID=0x12341234, CFCS=0x76547654, CFRV=0x87658765, CFLT=0x98769876
CBIO=0x12344321, CBMA=0x23454321, CFIT=0x34567654, CFDA=0x76544567
MII registers
Register 0x00: 0x1234 0x1234 0x2345 0x3456 0x4567 0x5678 0x6789 0x7890
Register 0x08: 0x9876 0x8765 0x7654 0x6543 0x5432 0x4321 0x3210 0x2109
Register 0x10: 0x1234 0x2345 0x3456 0x4567 0x5678 0x6789 0x7890
Register 0x18: 0x9876 0x8765 0x7654 0x6543 0x5432 0x4321
DEC21140 statistics
filtered_in_sw=1000, throttled=10, enabled=10
rx_fifo_overflow=10, rx_no_enp=12, rx_late_collision=18
rx_watchdog=15, rx_process_stopped=15, rx_buffer_unavailable=1500
tx_jabber_timeout=10, tx_carrier_loss=2, tx_deferred=15
tx_no_carrier=1, tx_late_collision=10, tx_excess_coll=10
tx_process_stopped=1, fata_tx_err=0
```

The following is a sample output from the **showcontrollersfastethernet** command on a Cisco AS5300 router:

```
Router# show controller fastethernet 0
DEC21140
Setup Frame
(0 ) 00e0.1e3e.c179
(1 ) 0100.0ccc.cccc
(2 ) 0900.2b00.000f
(3 ) 0900.2b02.0104
(4 ) 0300.0000.0001
dec21140_ds=0x60BD33B8, registers=0x3C210000, ib=0x4002F75C, ring entries=32
rxring=0x4002F844, rxr shadow=0x60F14B58, rx_head=6, rx_tail=6
txring=0x4002FA6C, txr shadow=0x60F14BF8, tx_head=10, tx_tail=10, tx_count=0
```

```

tx_size=32, rx_size=32
PHY link up
DEC21140 Registers:
CSR0=0xFE024480, CSR3=0x4002F844, CSR4=0x4002FA6C, CSR5=0xFC660000
CSR6=0x322C2002, CSR7=0xFFFFA241, CSR8=0xE0000000, CSR9=0xFFFD3FF
CSR11=0xFFFE0000, CSR12=0xFFFFF09, CSR15=0xFFFFFEC8
DEC21140 PCI registers:
  bus_no=2, device_no=0
  CFID=0x00091011, CFCS=0x82800005, CFRV=0x02000021, CFLT=0x0000FF00
  CBIO=0x3C210001, CBMA=0x00000000, CFIT=0x28140100, CFDA=0x00000000
MII registers:
  Register 0x00:  0000  784D  2000  5C01  0001  0000  0000  0000
  Register 0x08:  0000  0000  0000  0000  0000  0000  0000  0000
  Register 0x10:  0000  0000  0000  0000  0000  0000  0001  8060
  Register 0x18:  8020  0840  0000  3000  A3B9
throttled=7, enabled=7
rx_fifo_overflow=0, rx_no_enp=0, late_collision=0
rx_watchdog=0, rx_process_stopped=0, rx_buffer_unavailable=0
tx_jabber_timeout=0, tx_carrier_loss=1, tx_deferred=0
tx_no_carrier=1, tx_late_collision=0, tx_excess_coll=0
tx_process_stopped=0, fatal_tx_err=0
overflow_resets=0
0 missed datagrams, 0 overruns
0 transmitter underruns, 0 excessive collisions
0 single collisions, 0 multiple collisions
0 dma memory errors, 0 CRC errors
0 alignment errors, 0 runts, 0 giants

```

The following is a sample output from the **showcontrollersfastethernet** command on a Cisco 7200 series router:

```

Router# show controllers fastethernet 0/0
Interface Fast Ethernet0/0
Hardware is DEC21140
dec21140_ds=0x60895888, registers=0x3C018000, ib=0x4B019500
rx ring entries=128, tx ring entries=128
rxring=0x4B019640, rxr shadow=0x60895970, rx_head=0, rx_tail=0
txring=0x4B019EC0, txr shadow=0x60895B98, tx_head=77, tx_tail=77, tx_count=0
CSR0=0xFFFFA4882, CSR3=0x4B019640, CSR4=0x4B019EC0, CSR5=0xFC660000
CSR6=0xE20CA202, CSR7=0xFFFFA241, CSR8=0xFFFE0000, CSR9=0xFFDD7FF
CSR11=0xFFFE0000, CSR12=0xFFFFF98, CSR15=0xFFFFFEC8
DEC21140 PCI registers:
  bus_no=0, device_no=6
  CFID=0x00091011, CFCS=0x02800006, CFRV=0x02000012, CFLT=0x0000FF00
  CBIO=0x7C5AFF81, CBMA=0x48018000, CFIT=0x0000018F, CFDA=0x0000AF00
MII registers:
  Register 0x00:  2000  780B  2000  5C00  01E1  0000  0000  0000
  Register 0x08:  0000  0000  0000  0000  0000  0000  0000  0000
  Register 0x10:  0000  0000  0000  0000  0000  0000  0000  8040
  Register 0x18:  8000  0000  0000  3800  A3B9
throttled=0, enabled=0, disabled=0
rx_fifo_overflow=0, rx_no_enp=0, rx_discard=0
tx_underrun_err=0, tx_jabber_timeout=0, tx_carrier_loss=1
tx_no_carrier=1, tx_late_collision=0, tx_excess_coll=0
tx_collision_cnt=0, tx_deferred=0, fatal_tx_err=0, mult_ovfl=0
HW addr filter: 0x60895FC0, ISL Enabled
Entry= 0: Addr=0100.0CCC.CCCC
Entry= 1: Addr=0300.0000.0001
Entry= 2: Addr=0100.0C00.0000
Entry= 3: Addr=FFFF.FFFF.FFFF
Entry= 4: Addr=FFFF.FFFF.FFFF
Entry= 5: Addr=FFFF.FFFF.FFFF
Entry= 6: Addr=FFFF.FFFF.FFFF

```



```

Entry= 7: Addr=FFFF.FFFF.FFFF
Entry= 8: Addr=FFFF.FFFF.FFFF
Entry= 9: Addr=FFFF.FFFF.FFFF
Entry=10: Addr=FFFF.FFFF.FFFF
Entry=11: Addr=FFFF.FFFF.FFFF
Entry=12: Addr=FFFF.FFFF.FFFF
Entry=13: Addr=FFFF.FFFF.FFFF
Entry=14: Addr=FFFF.FFFF.FFFF
Entry=15: Addr=0060.3E28.6E00

```

## Shared Port Adapter Examples

The following is sample output from the **showcontrollersfastethernet** command for the first interface (port 0) on a 4-Port 10/100 Fast Ethernet SPA that is located in the top subslot (0), of the MSC that is installed in slot 4 on a Cisco 7304 router:

```

Router# show controllers fastethernet 4/0/0
Interface FastEthernet4/0/0
  Hardware is SPA-4FE-7304
  Connection mode is auto-negotiation
  Interface state is up, link is up
  Configuration is Auto Speed, Auto Duplex
  Selected media-type is RJ45
  Promiscuous mode is off, VLAN filtering is enabled
  MDI crossover status: MDI
  Auto-negotiation configuration and status:
    Auto-negotiation is enabled and is completed
    Speed/duplex is resolved to 100 Mbps, full duplex
    Advertised capabilities: 10M/HD 10M/FD 100M/HD 100M/FD Pause capable (Asymmetric)
    Partner capabilities: 10M/HD 10M/FD 100M/HD 100M/FD Pause capable
  MAC counters:
    Input: packets = 15, bytes = 1776
           FIFO full/reset removed = 0, error drop = 0
    Output: packets = 18, bytes = 2622
           FIFO full/reset removed = 0, error drop = 0
    Total pause frames: transmitted = 0, received = 0
  FPGA counters:
    Input: Total (good & bad) packets: 15, TCAM drops: 4
           Satisfy (host-backpressure) drops: 0, CRC drops: 0
           PL3 RERRs: 0
    Output: EOP (SPI4) errors: 0
  SPA carrier card counters:
    Input: packets = 11, bytes = 1476, drops = 0
    Output: packets = 18, bytes = 2550, drops = 0
    Egress flow control status: XON
  Per bay counters:
    General errors: input = 0, output = 0
    SPI4 errors: ingress dip4 = 0, egress dip2 = 0
  SPA Error counters:
    SPI4 TX out of frame error = 2 (00:02:31 ago)
    SPI4 TX Train valid error = 1 (00:02:11 ago)
    SPI4 TX DIP4 error = 1 (00:01:30 ago)
    SPI4 RX out of frame error = 1 (00:00:36 ago)
    SPI4 RX DIP2 error = 1 (00:00:13 ago)
  MAC destination address filtering table:
    Table entries: Total = 512, Used = 4, Available = 508
    Index MAC destination address      Mask
    -----
    1      0007.0ed3.ba80                 ffff.ffff.ffff
    2      ffff.ffff.ffff                 ffff.ffff.ffff
    3      0100.0000.0000                 0100.0000.0000

```

```

4      0100.0ccc.cccc      ffff.ffff.ffff
VLAN filtering table:
Number of VLANs configured on this interface = 0
Table entries: Total = 1024, Used = 2, Available = 1022
Index  VLAN identifier  Enabled  Tunnel
-----  -
1      0                No       No
2      0                Yes      No
Platform details:
  PXF tif number: 0x10

```

The table below describes the fields shown in the interface configuration section of the display. This section is useful for verifying the status of autonegotiation and configured parameters on the link, and the amount of traffic being handled by the interface.

**Table 1: show controllers Command Field Descriptions--Interface Section**

Field	Description
Interface	Name of the interface.
Hardware	Type of hardware.
Connection mode	Indicator of autonegotiation used to establish the connection.
Link	State of the link.
Configuration	Configuration of the speed and duplex operation on the interface.
Selected media-type	Interface port media type. RJ-45 is the only type supported on the 4-Port 10/100 Fast Ethernet SPA.
Promiscuous mode	State of promiscuous mode (on or off). When promiscuous mode is on, the SPA disables MAC destination address and VLAN filtering. When promiscuous mode is off, the SPA enables MAC destination address and VLAN filtering.
VLAN filtering	Status of ternary content addressable memory (TCAM) filtering of VLANs (enabled or disabled). By default, the SPA always enables VLAN filtering.  The SPA disables VLAN filtering if the TCAM table is full, or if the SPA is operating in promiscuous mode.  <b>Note</b> VLAN filtering is not enabled or disabled using any command-line interface (CLI) command.
MDI crossover status	State of the media dependent interface (MDI) for the PHY device on the specified interface. The possible values are MDI for straight-through cables or media dependent interface crossover (MDI-X) for crossover cables.
Auto-negotiation	State of autonegotiation (enabled or disabled) on the interface and its current status.
Speed/duplex is resolved to	Results of autonegotiated parameter values (speed and duplex) currently being used on the link.

Field	Description
Advertised capabilities	<p>List of the possible combinations of speed and duplex modes (in <i>speed/duplex</i> format) and flow control that the local interface has advertised it supports to the remote device:</p> <ul style="list-style-type: none"> <li>• For speed--10M is 10 Mbps, and 100M is 100 Mbps.</li> <li>• For duplex--HD is half duplex, and FD is full duplex.</li> <li>• For flow control--“Pause capable (Asymmetric)” means that the SPA advertises support of the PAUSE flow control bit and the ASM_DIR (asymmetric) flow control bit.</li> </ul>
Partner capabilities	<p>List of the possible combinations of speed and duplex modes (in <i>speed/duplex</i> format) and flow control that the remote device has advertised it supports to the local interface:</p> <ul style="list-style-type: none"> <li>• For speed--10M is 10 Mbps, and 100M is 100 Mbps.</li> <li>• For duplex--HD is half duplex, and FD is full duplex.</li> <li>• For flow control--“Pause capable” means that the remote device supports implementation of the PAUSE flow control bit; “Pause capable (Asymmetric)” means that the remote device supports implementation of the PAUSE flow control bit and the ASM_DIR (asymmetric) flow control bit.</li> </ul>

The table below describes the fields shown in the MAC counters section of the display. This section is useful for verifying the status of packets processed by the MAC device for the interface. This information is useful for Cisco Systems technical support personnel.

**Table 2: show controllers Command Field Descriptions--MAC Counters Section**

Field	Description
Input: packets, bytes	<p>Total number of packets and bytes received by the MAC device for the interface since it was activated or cleared.</p> <p>You can clear these counters using the <b>clearcounters</b> privileged EXEC command.</p>
Input: FIFO full/reset removed	<p>Total number of packets removed by the MAC device due to a first-in, first-out (FIFO) overflow condition in the input buffer for the interface.</p>
Input: error drop	<p>Total number of input packets with errors that are dropped by the MAC device for the interface.</p>
Output: packets, bytes	<p>Total number of packets and bytes transmitted by the MAC device for the interface since it was activated or cleared.</p> <p>You can clear these counters using the <b>clearcounters</b> privileged EXEC command.</p>

Field	Description
Output: FIFO full/reset removed	Total number of packets removed by the MAC device due to a first-in, first-out (FIFO) overflow condition in the output buffer for the interface.
Output: error drop	Total number of output packets with errors that are dropped by the MAC device for the interface.
Total pause frames	Total number of Ethernet 802.3x pause frames transmitted and received by the MAC device for flow control on the interface.

The table below describes the fields shown in the FPGA counters section of the display. This section is useful for verifying the status of packets processed by the FPGA device for the interface. This information is useful for Cisco Systems technical support personnel.

**Table 3: show controllers Command Field Descriptions--FPGA Counters Section**

Field	Description
Input: Total (good & bad) packets	Total number of packets received by the FPGA device in the ingress direction for the interface.
Input: TCAM drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to a ternary content addressable memory (TCAM) lookup failure. This counter increments when the interface receives a frame with a destination MAC address or VLAN identifier that is not present in the TCAM table.
Input: Satisfy (host-backpressure) drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to back-pressure from the MSC.
Input: CRC drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to cyclic redundancy check (CRC) errors.
Input: PL3 RERRs	Total number of packets with errors received for the interface by the FPGA device in the ingress direction over the System Packet Interface Level 3 (SPI3) (also called PL3) path from the MAC device to the FPGA device.
Output: EOP (SPI4) errors	Total number of packets with end-of-packet (EOP) errors received by the FPGA device in the egress direction for the interface over the System Packet Interface Level 4 (SPI4) path from the MSC to the FPGA device.

The table below describes the fields shown in the SPA carrier card counters section of the display. This section is useful for verifying the status of packets processed by the MSC for the interface. This information is useful for Cisco Systems technical support personnel.

**Table 4: show controllers Command Field Descriptions--SPA Carrier Card Counters Section**

Field	Description
Input: packets, bytes, drops	Total number of packets, bytes, and packet drops that have occurred on the SPI4 path from the FPGA device to the MSC.

Field	Description
Output: packets, bytes, drops	Total number of packets, bytes, and packet drops that have occurred on the SPI4 path from the MSC to the FPGA device.
Egress flow control status	Status of flow control between the MSC and the Route Processor (RP). The possible values are: <ul style="list-style-type: none"> <li>• XON--A control frame has been sent by the MSC to the RP to indicate that the MSC is ready to accept data.</li> <li>• XOFF--A control frame has been sent by the MSC to the RP to indicate congestion on the MSC. The MSC cannot accept any more data from the RP during this condition.</li> </ul>
General errors	Total number of errors (such as parity) on the MSC in the ingress and egress direction.
SPI4 errors: ingress dip4	Total number of 4-bit Diagonal Interleaved Parity (DIP4) errors in the ingress direction on the SPI4 path from the FPGA device to the MSC.  DIP4 is a parity algorithm where a 4-bit odd parity is computed diagonally over control and data words.
SPI4 errors: egress dip2	Total number of 2-bit Diagonal Interleaved Parity (DIP2) errors in the egress direction on the SPI4 path from the FPGA device to the MSC.  DIP2 is a parity algorithm where a 2-bit odd parity is computed diagonally over status words.

The table below describes the fields shown in the SPA error counters section of the display. This section appears only when one of the SPI4 transmit or receive errors occurs on the interface. This information is useful for Cisco Systems technical support personnel.



**Note** None of the SPA SPI4 error counters appear in **showcontrollersfastethernet** command output until at least one of those types of SPI4 errors occurs.

All of the errors in the SPA error counters section are subject to the SPA automatic recovery process when certain thresholds are reached. For more information about this process on the Cisco 7304 router, refer to the “Understanding SPA Automatic Recovery” section of the *Cisco 7304 Router Modular Services Card and Shared Port Adapter Software Configuration Guide*

Table 5: show controllers Command Field Descriptions--SPA Error Counters Section

Field	Description
SPI4 TX out of frame error = 2 (00:02:31 ago)	<p>Number of SPI4 out-of-frame errors (events) detected in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected.</p> <p>This error indicates a loss of synchronization between the synchronization block and the data received on the SPI4 path. When synchronization is reacquired, the error no longer occurs.</p>
SPI4 TX Train valid error = 1 (00:02:11 ago)	<p>Number of times that a low-level synchronization problem was detected in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected.</p>
SPI4 TX DIP4 error = 1 (00:01:30 ago)	<p>Number of 4-bit Diagonal Interleaved Parity (DIP4) errors in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected.</p> <p>DIP4 is a parity algorithm where a 4-bit odd parity is computed diagonally over control and data words.</p>
SPI4 RX out of frame error = 1 (00:00:36 ago)	<p>Number of SPI4 out-of-frame errors (events) detected in the receive direction (from the network), from the SPA FPGA device to the MSC. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected.</p> <p>This error indicates a loss of synchronization between the synchronization block and the data received on the SPI4 path. When synchronization is reacquired, the error no longer occurs.</p>
SPI4 RX DIP2 error = 1 (00:00:13 ago)	<p>Number of 2-bit Diagonal Interleaved Parity (DIP2) errors in the receive direction (from the network), from the SPA FPGA device to the MSC. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected.</p> <p>DIP2 is a parity algorithm where a 2-bit odd parity is computed diagonally over status words.</p>

The table below describes the fields shown in the MAC destination address filtering table section of the display. This section is useful for verifying the multicast destination addresses that are in the TCAM table and permitted by the interface. This information is useful for Cisco Systems technical support personnel.

**Table 6: show controllers Command Field Descriptions--MAC Destination Address Filtering Table Section**

Field	Description
Table entries: Total, Used, Available	Total number of MAC destination address entries possible in the TCAM table for the interface, the number of table entries currently used by the interface, and the number of table entries that remain available.  The 4-Port 10/100 Fast Ethernet SPA supports a 512-entry MAC filtering table for each supported interface (2048 entries total on the card).
Index	Table entry identifier.
MAC destination address	MAC destination address (multicast) permitted by the interface and used in the TCAM lookup table for packet filtering.  The multicast MAC entries typically come from routing protocols [such as Open Shortest Path First (OSPF) and Enhanced IGRP (EIGRP)], and other protocols including the Hot Standby Router Protocol (HSRP).  When the router reloads, three addresses appear by default in the MAC filtering table: the unicast address of the local interface, the Ethernet broadcast address, and the Ethernet multicast address.
Mask	Mask for the corresponding destination address. The SPA uses the bits that are set in the mask to look up the address in the TCAM table.

The table below describes the fields shown in the VLAN filtering table section of the display. This section is useful for verifying the VLANs that are in the TCAM table and are permitted by the interface. This information is useful for Cisco Systems technical support personnel.

**Table 7: show controllers Command Field Descriptions--VLAN Filtering Table Section**

Field	Description
Number of VLANs configured on this interface	Number of VLANs that are configured on the interface.  If the number of VLANs configured on the interface is 1022 or less, then the VLAN filtering table also shows an index entry for every VLAN ID. The number of VLANs configured on the interface can be 0, while the number of used table entries reports 2, because the SPA always uses two entries to provide valid matching criteria for promiscuous mode and non-VLAN packets.
Table entries: Total, Used, Available	Total number of VLAN entries possible in the TCAM filtering table for the interface, the number of table entries currently used by the interface (two are always in use by default), and the number of table entries that remain available.  The 4-Port 10/100 Fast Ethernet SPA supports a 1024-entry VLAN filtering table for each supported interface (4096 entries total on the card).
Index	Table entry identifier.
VLAN identifier	Number of the VLAN. Two VLAN ID 0 entries always appear in the table and represent the local interface port for handling of promiscuous mode and non-VLAN packets.  Other VLAN entries appear in this table when VLANs are configured on the interface.

Field	Description
Enabled	<p>Status of the VLAN ID for TCAM filtering, with the following possible values:</p> <ul style="list-style-type: none"> <li>• No--The entry is disabled for filtering.</li> <li>• Yes--The entry is enabled for filtering.</li> </ul> <p>The TCAM filter uses the “first-match” rule to filter packets that the SPA receives against entries in the table. The matching assessment begins at the top of the table with the VLAN ID 0 entries.</p> <p><b>Note</b> The SPA always supports two VLAN ID 0 entries. The first VLAN ID 0 entry of the TCAM table is used for promiscuous mode. It has a value of “No,” meaning it is disabled, whenever promiscuous mode is disabled for the interface. The second VLAN ID 0 entry is used for filtering of non-VLAN packets.</p>
Tunnel	<p>Status of tunneling for the interface, with the following possible values:</p> <ul style="list-style-type: none"> <li>• No--Tunneling is disabled and the SPA performs MAC destination address filtering.</li> <li>• Yes--Tunneling is enabled and the SPA does not perform MAC destination address filtering.</li> </ul> <p><b>Note</b> If promiscuous mode is enabled, then the first VLAN ID 0 entry shows tunnel = Yes. All other VLAN ID entries show tunnel = No.</p>

The table below describes the fields shown in the Platform details section of the display.

**Table 8: show controllers Command Field Descriptions--Platform Details Section**

Field	Description
PXF tif number	Number of the interface (in hexadecimal format) used for PXF on the network services engine (NSE) or by the Hyper Transport (HT) FPGA device on the network processing engine (NPE).

#### Related Commands

Command	Description
<b>show interfaces fastethernet</b>	Displays information about the Fast Ethernet interfaces.



# show cwan

To display the WAN statistics and information about the hidden VLAN-to-WAN interface, use the **show cwan** command in user EXEC mode.

**show cwan {stats | vlans}**

## Syntax Description

<b>stats</b>	Displays WAN statistics.
<b>vlans</b>	Displays the hidden VLAN-to-WAN interface mapping.

## Command Default

This command has no default settings.

## Command Modes

User EXEC (>)

## Command History

Release	Modification
12.2(17d)SXB	This command was introduced on the Supervisor Engine 2.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

## Usage Guidelines

The **show cwan** command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 720.

The **show vlan internal usage** command displays the internal VLANs that are allocated to WAN interfaces as Layer 3 VLANs but does not display the associated subinterfaces. To display the associated subinterfaces, enter the **show cwan vlans** command. The **show cwan vlans** command displays the mapping between the WAN subinterface and the internal VLANs in use.

## Examples

The following sample output displays WAN statistics:

```
Router# show cwan stats
0 unknown VLANs
0 ATM packets with zero src_ltl or inactive VC
0 unknown enctype
0 output unknown enctype drops
0 particle alloc failures
0 pak alloc failures
Router#
```

The following sample output displays the hidden VLAN-to-WAN interface mappings:

```
Router# show cwan vlans

Hidden VLAN swidb->if_number Interface
-----
1017 75 ATM2/0/0
1018 90 ATM2/0/0.54
1019 92 ATM2/0/0.56
1020 93 ATM2/0/0.57
1021 94 ATM2/0/0.100
```

```

1022 95 ATM2/0/0.101
1023 96 ATM2/0/0.102
1024 97 ATM2/0/0.103
1025 98 ATM2/0/0.110
1026 99 ATM2/0/0.111
1027 100 ATM2/0/0.112
1028 101 ATM2/0/0.113
1029 102 ATM2/0/0.120
1030 103 ATM2/0/0.200
1031 104 ATM2/0/0.201
1032 105 ATM2/0/0.202
1033 106 ATM2/0/0.203
1067 76 POS4/1
1068 77 POS4/2
1071 79 GE-WAN5/2
1072 80 GE-WAN5/3
1073 81 GE-WAN5/4
Recycled VLAN Interface
-----
Pending recycle holdtime(ms) Interface
-----
Router#

```

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

**Table 9: show cwan Field Descriptions**

Field	Description
Hidden VLAN	Hidden VLAN number.
swidb->if_number	Software interface descriptor block interface number.
Interface	Interface name.

#### Related Commands

Command	Description
<b>ip access-list hardware permit fragments</b>	Permits all noninitial fragments in the hardware.
<b>show vlan internal usage</b>	Displays information about internal VLAN allocation.

# show cwan qinq

To display the inner, outer, and trunk VLANs that are used in IEEE 802.1Q-in-802.1Q (QinQ) translation, use the **showcwanqinq** command in privileged EXEC mode.

**show cwan qinq** [{**configured** | **detail** | **list**}]

Syntax Description	configured	(Optional) Displays statistics for all configured bridge domains.
	detail	(Optional) Displays the details of the inner VLAN configurations for each bridge domains.
	list	(Optional) Displays the currently configured assignments.

**Command Default** The inner, outer, and trunk VLANs that are used in IEEE 802.1Q-in-802.1Q (QinQ) translation are not displayed.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(18)SXD	Support for this command was introduced on the Supervisor Engine 720.
	12.2(18)SXE	This command was changed as follows: <ul style="list-style-type: none"> <li>• Support was added for QinQ link bundles that use virtual port-channel interfaces.</li> <li>• The <b>configured</b>, <b>detail</b>, and <b>list</b> keywords were added.</li> </ul>
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

**Usage Guidelines** This command is supported on the Gigabit Ethernet WAN interfaces on Cisco 7600 series routers that are configured with an Optical Services Module (OSM)-2+4GE-WAN+ OSM module only.

OSMs are not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 32.

The **showcwanqinq** command shows a summary of the QinQ translations being performed. See the other related commands for additional information:

- **show cwan qinq**
- **show cwan qinq bridge-domain**
- **show cwan qinq interface**

## Examples

This example shows the typical output from the **showcwanqinq** command:

```
Router# show cwan qinq
```

```

Bridge-domain  Interface      Egress-if      Inner-start  Total  Active
32             GE4/4          GE4/4          32           1      1
  Sub-Interface  Trunk-vlan    Inner-vlan     Service      State
  GE4/4.1        101           32             dot1q        up/down
Bridge-domain  Interface      Egress-if      Inner-start  Total  Active
888           Po1            GE4/1          32           1      1
  Sub-Interface  Trunk-vlan    Inner-vlan     Service      State
  Po1.1          101           32             dot1q        up/up
Router#

```

The table below describes the fields shown in the display.

**Table 10: show cwan qinq Field Descriptions**

Field	Description
Bridge-domain	VLAN ID for the outer PE VLAN tag that is expected on the original incoming packets.
Interface	Gigabit Ethernet WAN interface or subinterface being used for the QinQ translation.
Egress-if	Output interface being used for packets on this particular subinterface and PE VLAN ID.
Inner-start	Start of the 32-count block of inner CE VLAN IDs that are being used for the outer PE VLAN tag. The base number is always evenly divisible by 32. Any CE VLAN IDs that do not fall within this block of 32 IDs are considered to be out of range.
Total	Total number of CE VLAN subinterfaces that are configured for this PE VLAN ID (bridge domain).
Active	Total number of VLAN translations that are currently active for this bridge domain.
Sub-interface	Subinterface on a Gigabit Ethernet WAN interface or port-channel interface for this particular VLAN translation.
Trunk-vlan	VLAN ID for the trunk VLAN tag that is added to the outgoing translated packet as the outer (or only) VLAN tag.
Inner-vlan	VLAN ID for the inner CE VLAN tag that is expected on the original incoming packets.
Service	Type of QinQ configuration being used on the subinterface: <ul style="list-style-type: none"> <li>• <b>dot1q-drop</b> --Invalid configuration or all packets are being dropped.</li> <li>• <b>dot1q</b> --Subinterface is configured for QinQ translate mode (two-tags to one-tag translation: <b>bridge-domaindot1q</b>).</li> <li>• <b>dot1q-tunnel</b> --Subinterface is configured for QinQ tunnel mode (two-tags to two-tags transparent tunneling: <b>bridge-domaindot1q-tunnel</b>).</li> <li>• <b>dot1q-tunnel out-range</b> --Subinterface is configured for out-of-range packets for this particular PE VLAN (<b>bridge-domaindot1q-tunnelout-range</b>).</li> </ul>
State	Current

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>class-map</b>	Accesses the QoS class map configuration mode to configure QoS class maps.
<b>mode dot1q-in-dot1q access-gateway</b>	Enables a Gigabit Ethernet WAN interface to act as a gateway for QinQ VLAN translation.
<b>policy-map</b>	Accesses QoS policy-map configuration mode to configure the QoS policy map.
<b>service-policy</b>	Attaches a policy map to an interface.
<b>set cos cos-inner (policy-map configuration)</b>	Sets the 802.1Q prioritization bits in the trunk VLAN tag of a QinQ-translated outgoing packet with the priority value from the inner customer-edge VLAN tag.
<b>show policy-map</b>	Displays information about the policy map.
<b>show policy-map interface</b>	Displays the statistics and the configurations of the input and output policies that are attached to an interface.

## show cwan qinq bridge-domain

To display the provider-edge VLAN IDs that are used on a Gigabit Ethernet WAN interface for 802.1Q in 802.1Q (QinQ) translation or to show the customer-edge VLANs that are used for a specific provider-edge VLAN, use the **showcwanqinqbridge-domain** command in privileged EXEC mode.

**show cwan qinq bridge-domain** [*pe-vlan-id*]

### Syntax Description

<i>pe-vlan-id</i>	(Optional) Information for the specified provider-edge VLAN ID; valid values are from 1 to 4094.
-------------------	--

### Command Default

If you do not specify a *vlan-id*, the provider-edge VLANs that are configured for each Gigabit Ethernet WAN interface displays.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(18)SXD	Support for this command was introduced as <b>showcwanqinqbridge-vlan</b> on the Supervisor Engine 720.
12.2(18)SXE	This command was renamed <b>showcwanqinqbridge-domain</b> . Support was also added for QinQ link bundles using port-channel virtual interfaces.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

### Usage Guidelines

This command is supported on the GE-WAN interfaces on Cisco 7600 series routers that are configured with an Optical Services Module (OSM)-2+4GE-WAN+ OSM module only.

OSMs are not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 32.

### Examples

This example shows typical output from the **showcwanqinqbridge-domain** command. This output displays the provider-edge VLANs (bridge VLANs) for all GE-WAN interfaces on the Cisco 7600 series router:

```
Router# show cwan qinq bridge-domain

GE-WAN5/1, group 1, total_rate 2
 2, 4062
GE-WAN5/2, group 1, total_rate 1
 150
GE-WAN5/3, group 1, total_rate 2
 100, 1000
GE-WAN5/4, group 1, total_rate 16
 3-5, 7-10,12-15,18-20,22, 4094
Port-channell1, group 1, total_rate 21
Router#
```

This example shows typical output for a specific provider-edge VLAN:

```
Router# show cwan qinq bridge-domain 4094
```

```

Bridge-domain  Interface      Egress-if      Inner-start  Service Count
4093           GE5/4          GE2/3          192         31
Sub-Interface  Trunk-vlan    Inner-vlan     Service
GE5/4.4000    4000          default        dot1q-tunnel out-ran
GE5/4.4062    4062          1              dot1q-tunnel
GE5/4.4064    4064          3              dot1q-tunnel
GE5/4.4067    4067          6              dot1q-tunnel
GE5/4.4068    4068          7              dot1q-tunnel
.
.
.

```

The table below describes the fields shown in the display.

**Table 11: show cwan qinq bridge-domain Field Descriptions**

Field	Description
Bridge-domain	Outer provider-edge VLAN IDs that are configured on the subinterfaces for this interface. These IDs are shown as a range, where possible, or as individual IDs.
interface	Gigabit Ethernet WAN interface or subinterface that is used.
Egress-if	Output interface being used for packets on this particular subinterface and VLAN.
Inner-start	Start of the 32-count block of inner customer-edge VLAN IDs that are used for the outer provider-edge VLAN tag. The base number is always evenly divisible by 32. Any customer-edge VLAN IDs that do not fall within this block of 32 IDs are out of range.
Service Count	Number of service translations that are currently configured and in use.
Tr-vlan	VLAN ID for the trunk VLAN tag that is added to the outgoing translated packet as the outer (or only) VLAN tag.
Inner-vlan	VLAN ID for the inner customer-edge VLAN tag that is expected on the original packets received on this subinterface. If this field shows "default," it indicates that the subinterface matches all out-of-range packets (packets with a customer-edge VLAN ID that are not within the configured 32-count block of customer-edge VLAN IDs).
Service	Type of QinQ configuration that is used on the subinterface: <ul style="list-style-type: none"> <li>• <b>dot1q-drop</b> --Invalid configuration or all packets are being dropped.</li> <li>• <b>dot1q</b> --Subinterface is configured for QinQ translate mode (two-tags to one-tag translation: <b>bridge-vlandot1q</b>).</li> <li>• <b>dot1q-tunnel</b> --Subinterface is configured for QinQ tunnel mode (two-tags to two-tags transparent tunneling: <b>bridge-vlandot1q-tunnel</b>).</li> <li>• <b>dot1q-tunnel out-ran</b> --Subinterface is configured for out-of-range packets for this particular provider-edge VLAN (<b>bridge-vlandot1q-tunnelout-range</b>).</li> </ul>

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>class-map</b>	Accesses the QoS class map configuration mode to configure QoS class maps.
<b>mode dot1q-in-dot1q access-gateway</b>	Enables a Gigabit Ethernet WAN interface to act as a gateway for QinQ VLAN translation.
<b>policy-map</b>	Accesses QoS policy-map configuration mode to configure the QoS policy map.
<b>service-policy</b>	Attaches a policy map to an interface.
<b>set cos cos-inner (policy-map configuration)</b>	Sets the 802.1Q prioritization bits in the trunk VLAN tag of a QinQ-translated outgoing packet with the priority value from the inner customer-edge VLAN tag.
<b>show cwan qinq</b>	Displays the inner, outer, and trunk VLANs that are used in QinQ translation.
<b>show cwan qinq interface</b>	Displays interface statistics for IEEE 802.1Q-in-802.1Q (QinQ) translation on one or all Gigabit Ethernet WAN interfaces and port-channel interfaces.





## show cwan qinq interface

```

GE1/2.501      up      GE3/3 1 50 3201 501 3586      0          3498
              466294    412323
GE1/2.502      up      GE3/3 1 50 3202 502 3577      0          3481
              464844    410704
.
.
Router#

```

This example shows the output for a specific interface:

```
Router# show cwan qinq interface GE-WAN 1/2
```

Interface	Status	Egress op PE	CE	TRNK	Input packets/ Input bytes	Output packets/ Output bytes
GE1/2.500	up	GE7/0 1 50	3200	500	626485 492579036	63571 508305780
GE1/2.501	up	GE7/0 1 50	3201	501	626483 492579644	63571 508305780
GE1/2.502	up	GE7/0 1 50	3202	502	626485 492701011	63571 508305780
.	.	.	.	.	.	.

```
Router#
```

This example shows the output for a specific subinterface:

```
Router# show cwan qinq interface GE-WAN 5/1.1000
```

Interface	Status	Egress op PE	CE	TRNK	Input packets/ Input bytes	Output packets/ Output bytes
GE5/1.1000	up	GE3/1 1 2	2496	1000	476790463 47168162431	12108753 1110048768

```
Router#
```

This example shows an excerpt from the typical output for a specific subinterface:

```
Router# show cwan qinq interface GE-WAN 5/1.1000
```

Interface	Status	Egress op PE	CE	TRNK	Input packets/ Input bytes	Output packets/ Output bytes
GE5/1.1000	up	GE3/1 1 2	2496	1000	476790463 47168162431	12108753 1110048768

```
Router#
```

This example shows an excerpt from the typical output for a specific port-channel virtual interface:

```
Router# show cwan qinq interface port 3
```

Interface	Status	Egress op PE	CE	TRNK	Input packets/ Input bytes	Output packets/ Output bytes
Po3.101	up/up	GE2/3 1 150	223	323	59759000 3824576384	23971 819613
Po3.102	up/up	GE2/3 1 150	222	324	59758987 3824575552	23914 818231
.	.	.	.	.	.	.

```

.
.
Router#

```

The table below describes the fields shown in the displays.

**Table 12: show cwan qinq interface Field Descriptions**

Field	Description
Interface	Gigabit Ethernet WAN or port-channel interface or subinterface being used.
Status	Current status of this interface: up or down.
Egress	Output interface being used for packets on this particular subinterface and VLAN.
op	Operational status code and QinQ configuration of this subinterface: <ul style="list-style-type: none"> <li>• 0--Invalid configuration or all packets are being dropped.</li> <li>• 1--Subinterface is configured for QinQ translate mode (two-tags to one-tag translation: <b>bridge-domaindot1q</b>).</li> <li>• 2--Subinterface is configured for QinQ tunnel mode (two-tags to two-tags transparent tunneling: <b>bridge-domaindot1q-tunnel</b>).</li> <li>• 3--Not used.</li> <li>• 4--Subinterface is configured for out-of-range packets for this particular PE VLAN (<b>bridge-domaindot1q-tunnelout-range</b>).</li> </ul>
PE	Outer provider edge (PE) VLAN IDs that have been configured on the subinterfaces for this interface.
CE	VLAN ID for the inner customer edge (CE) VLAN tag that is expected on the original packets being received on this subinterface.
Trnk	VLAN ID for the trunk VLAN tag that is added to the outgoing translated packet as the outer (or only) VLAN tag.
Input packets	Number of packets received on this subinterface.
Input bytes	Number of bytes received on this subinterface.
Output packets	Number of translated packets that were transmitted out this subinterface.
Output bytes	Number of translated bytes that were transmitted out this subinterface.

#### Related Commands

Command	Description
<b>bridge-domain (subinterface configuration)</b>	Binds a PVC to the specified VLAN ID.
<b>class-map</b>	Accesses the QoS class map configuration mode to configure QoS class maps.

<b>Command</b>	<b>Description</b>
<b>mode dot1q-in-dot1q access-gateway</b>	Enables a Gigabit Ethernet WAN interface to act as a gateway for QinQ VLAN translation.
<b>policy-map</b>	Accesses QoS policy-map configuration mode to configure the QoS policy map.
<b>service-policy</b>	Attaches a policy map to an interface.
<b>set cos cos-inner (policy-map configuration)</b>	Sets the 802.1Q prioritization bits in the trunk VLAN tag of a QinQ-translated outgoing packet with the priority value from the inner customer-edge VLAN tag.
<b>show cwtlc qinq</b>	Displays the information that is related to QinQ translation and is contained in the XCM on board the supervisor engine.
<b>show policy-map</b>	Displays information about the policy map.
<b>show policy-map interface</b>	Displays the statistics and the configurations of the input and output policies that are attached to an interface.

## show cwan qinq load-balance

To display load-balancing statistics for IEEE 802.1Q-in-802.1Q (QinQ) translation on one or all Gigabit Ethernet WAN interfaces and port-channel interfaces, use the **showcwanqinqload-balance** command in privileged EXEC mode.

**show cwan qinq load-balance** [*{channel-number* | **configured** | **detail** | **list**}]

Syntax Description	
<i>channel-number</i>	(Optional) Statistics for a specific channel group; valid values are from 1 to 256.
<b>configured</b>	(Optional) Displays statistics for all configured port channels.
<b>detail</b>	(Optional) Displays the details of the inner VLAN configurations for each port channel.
<b>list</b>	(Optional) Displays the currently configured assignments.

**Command Default** If you enter this command without any options, it displays information for all Gigabit Ethernet WAN and port-channel interfaces in the router.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(18)SXE	Support for this command was introduced on the Supervisor Engine 720.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

### Examples

This example shows an excerpt from the typical output from the default form of the **showcwanqinqload-balance** command:

```
Router# show cwan qinq load-balance

Port-channel10 total 505 bridge-domain vlan(s) active
  Po10 - GE-WAN3/1 has 167 bridge-domain vlan(s) active
  Po10 - GE-WAN3/2 has 169 bridge-domain vlan(s) active
  Po10 - GE-WAN9/1 has 169 bridge-domain vlan(s) active
Port-channel20 total 4 bridge-domain vlan(s) active
  Po20 - GE-WAN3/3 has 1 bridge-domain vlan(s) active
  Po20 - GE-WAN3/4 has 1 bridge-domain vlan(s) active
  Po20 - GE-WAN9/2 has 1 bridge-domain vlan(s) active
  Po20 - GE-WAN9/3 has 1 bridge-domain vlan(s) active
Router#
```

This example shows typical output when using the **configured** keyword:

```
Router# show cwan qinq load-balance configured

Port-channell1 total 1 bridge-domain vlan(s) active
  Po1 - GE-WAN4/1 has 1 bridge-domain vlan(s) active
      GE-WAN4/1 has 1 bridge-domain vlan(s) configured: 888
  Po1 - GE-WAN8/1 has 0 bridge-domain vlan(s) active
```

```

GE-WAN8/1 has 1 bridge-domain vlan(s) configured: 889
Router#

```

This example shows typical output when using the **list** keyword:

```

Router# show cwan qinq load-balance list

Port-channell1 total 1 bridge-domain vlan(s) active
  Pol - GE-WAN4/1 has 1 bridge-domain vlan(s) active
  Pol - GE-WAN4/1 active vlan(s): 888
  Pol - GE-WAN8/1 has 0 bridge-domain vlan(s) active
  Pol - GE-WAN8/1 active vlan(s): 889
Router#

```

This example shows typical output when using the **detail** keyword:

```

Router# show cwan qinq load-balance detail

Port-channell1 total 1 bridge-domain vlan(s) active
  Pol - GE-WAN4/1 has 1 bridge-domain vlan(s) active
    Bridge-domain Inner  Configured Active
    -----
    888             active 3           2
  Pol - GE-WAN8/1 has 0 bridge-domain vlan(s) active
    Bridge-domain Inner  Configured Active
    -----
    889             -           1           0
Router#

```

The table below describes the fields shown in this display.

**Table 13: show cwan qinq load-balance detail Field Descriptions**

Field	Description
Bridge-domain	PE VLANs being used on this interface.
Inner	Number of inner VLANs configured for this bridge domain.
Configured	Number of bridge domains that are configured on this interface.
Active	Number of bridge domains that are configured and active on this interface.

#### Related Commands

Command	Description
<b>class-map</b>	Accesses the QoS class map configuration mode to configure QoS class maps.
<b>mode dot1q-in-dot1q access-gateway</b>	Enables a Gigabit Ethernet WAN interface to act as a gateway for QinQ VLAN translation.
<b>policy-map</b>	Accesses QoS policy-map configuration mode to configure the QoS policy map.
<b>service-policy</b>	Attaches a policy map to an interface.

Command	Description
<b>set cos cos-inner (policy-map configuration)</b>	Sets the 802.1Q prioritization bits in the trunk VLAN tag of a QinQ-translated outgoing packet with the priority value from the inner customer-edge VLAN tag.
<b>show cwan qinq</b>	Displays the inner, outer, and trunk VLANs that are used in QinQ translation.
<b>show cwan qinq interface</b>	Displays interface statistics for IEEE QinQ translation on one or all Gigabit Ethernet WAN interfaces and port-channel interfaces.

# show cwan qinq port-channel

To display IEEE 802.1Q-in-802.1Q (QinQ) statistics for one or all configured QinQ link bundles (port channels), use the **showcwanqinqport-channel** command in privileged EXEC mode.

**show cwan qinq port-channel** [**detail** *channel-number*]

## Syntax Description

<b>detail</b> <i>channel-number</i>	(Optional) Displays statistics for a specific port-channel group; valid values are from 1 to 256.
-------------------------------------	---

## Command Default

If you use this command without the **detail** keyword, it displays statistics for all configured QinQ link bundles.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.2(18)SXE	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

## Usage Guidelines

This command displays the QinQ-related information for one or all port-channel groups that are being used for QinQ link bundles.



### Note

To display interface statistics, use the **showcwanqinqinterface** command.

## Examples

This example shows an excerpt from the typical output from the default form of the **showcwanqinqport-channel** command:

```
Router# showcwan qinq port-channel

Group   : WAN           if_num idb      pagp          if_num idb      port
-----  -----  d----- x-----  -----  d----- x----- d--
Group 1 : GE-WAN9/1     67      43CABB20 GE-WAN 9/1    88      4529B710 5
Router#
```

The table below describes the fields shown in the display.

**Table 14: showcwan qinq port-channel Field Descriptions**

Field	Description
Group	Channel group to which this interface belongs.
WAN	Interface being displayed.
if_num	Internal number for this interface.
idb	Memory value (in hexadecimal) for this interface in the interface database.



Field	Description
pagp	Interface providing the port aggregation protocol (PAGP) support.
if_num	Internal number for the PAGP interface.
idb	Memory value (in hexadecimal) for the PAGP interface in the interface database.
port	Port number.

## show cwtlc qinq

To display the information that is related to IEEE 802.1Q-in-802.1Q (QinQ) translation and is contained in the XCM onboard the supervisor engine, use the **showcwtlcqinq** command in privileged EXEC mode.

```
show cwtlc qinq port [{outer-vlan vlan-id [inner-vlan-id] | trunk-vlan vlan-id}]
show cwtlc qinq qos
```

### Syntax Description

<i>port</i>	Port number for the information to be displayed; valid values are from 0 to 3.
<b>outer-vlan</b> <i>vlan-id</i>	(Optional) Displays the XCM tables for a specific outer provider-edge VLAN ID; valid values are from 1 to 4094.
<i>inner-vlan-id</i>	(Optional) XCM tables for a specific inner customer-edge VLAN ID; valid values are from 1 to 4094.
<b>trunk-vlan</b> <i>vlan-id</i>	(Optional) Displays the XCM tables for a specific trunk VLAN ID that is put on translated packets as the new outer VLAN tag; valid values are from 1 to 4094.
<b>qos</b>	Displays the source of the 802.1P bits that are being inserted into the outer trunk VLAN tag of translated packets.

### Command Default

If you do not specify a specific VLAN ID, the command displays information for all VLANs.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(18)SXD	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

### Usage Guidelines

This command is supported on the Gigabit Ethernet WAN interfaces on Cisco 7600 series routers that are configured with an Optical Services Module (OSM)-2+4GE-WAN+ OSM module only.

OSMs are not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 32.

### Examples

This example shows the output for a specific combination of provider-edge and customer-edge VLAN IDs:

```
Router# show cwtlc qinq 0 outer-vlan 20 21

TX VLAN FUNC TABLE
func 4, ce vlan base 0, value 4
TX VLAN TABLE
tx vlan status 1
TX ADJ TABLE
ce_vlan_offset trunk_vlan op_code src_ltl def_fn pbit intfid
15             2           1       120    2     1     2
Router#
```

This example shows the output for the **trunk-vlan** keyword:

```
Router# show cwtlc qinq 0 trunk-vlan 2

RX VLAN FUNC TABLE
rx_vlan_func 2
RX TVC TABLE
rx_tvc_func src_ltl pe_vlan ce_vlan Q intfid
1          E0      1      20      0 2
Router#
```

The table below describes the fields shown in the display.

**Table 15: show cwtlc qinq Command Field Descriptions**

Field	Description
TX VLAN FUNC TABLE	
ce_vlan base	Start of the 32-count block of inner customer-edge VLAN IDs that are used for the outer provider-edge VLAN tag. The base number is always evenly divisible by 32. Any customer-edge VLAN IDs that do not fall within this block of 32 IDs are out of range.
TX VLAN TABLE	
tx_vlan status	Transmit VLAN Status: <ul style="list-style-type: none"> <li>• 0--QINQ_TX_DEF_DROP: Packet dropped.</li> <li>• 1--QINQ_TX_DEF_TRANSPARENT: Transparent tunneling.</li> </ul>
TX ADJ TABLE	
trunk_vlan	VLAN ID for the trunk VLAN tag that is added to the outgoing translated packet as the outer (or only) VLAN tag.
op_code	Operational status and QinQ configuration of this subinterface: <ul style="list-style-type: none"> <li>• 0--Invalid configuration or all packets are being dropped.</li> <li>• 1--Subinterface is configured for QinQ translate mode (two-tags to one-tag translation: <b>bridge-vlandot1q</b>).</li> <li>• 2--Subinterface is configured for QinQ tunnel mode (two-tags to two-tags transparent tunneling: <b>bridge-vlandot1q-tunnel</b>).</li> <li>• 3--Not used.</li> <li>• 4--Subinterface is configured for out-of-range packets for this particular provider-edge VLAN (<b>bridge-vlandot1q-tunnelout-range</b>).</li> </ul>
src_ltl	Source local target logic (LTL) address for this entry.

Field	Description
use_ce_pbit	Status of whether the outgoing translated packet is using the 802.1P bits (P bits) that are copied from the original packet's outer provider-edge VLAN tag or from the original packet's inner customer-edge VLAN tag: <ul style="list-style-type: none"> <li>• 0 = P bits are copied from the outer provider-edge VLAN tag.</li> <li>• 1 = P bits are copied from the inner customer-edge VLAN tag. See the <b>setcoscos-inner(policy-mapconfiguration)</b> command.</li> </ul>
intfid	Interface ID for the Gigabit Ethernet WAN interface that is used for the QinQ translation.
RX VLAN FUNC TABLE	
rx_vlan_func	Last performed function: <ul style="list-style-type: none"> <li>• 0--RXVLAN_DROP: Packet was dropped</li> <li>• 1--RXVLAN_NORMAL: Normal Ethernet packet</li> <li>• 2--RXVLAN_GATEWAY: Received packet from QinQ access gateway</li> <li>• 3--RXVLAN_L2_LISTEN</li> <li>• 4--RXVLAN_L2_LEARN</li> <li>• 5--RXVLAN_QINQ_FORWARD</li> <li>• 6--RXVLAN_WAN_TRUNK--Trunk VLAN</li> </ul>
RX TVC TABLE	
rx_tvc_func	Last performed function: <ul style="list-style-type: none"> <li>• 0--DROP: Packet was dropped</li> <li>• 1--GATEWAY_TRANSLATE: QinQ translation (double-tag to single-tag translation)</li> <li>• 2--GATEWAY_TRANSPARENT: QinQ transparent tunneling (double-tag to double-tag translation)</li> <li>• 3--WANTRUNK_XCONNECT: WAN port cross-connect</li> <li>• 4--WANTRUNK_SWITCH: WAN port switching</li> </ul>
src_ltl	Source local target logic (LTL) address for this entry.
pe_vlan	Provider-edge VLAN ID.
ce_vlan	Customer-edge VLAN ID.
intfid	Interface ID for the Gigabit Ethernet WAN interface that is used for the QinQ translation.

Related Commands	Command	Description
	<b>bridge-vlan</b>	Maps a subinterface to specific inner customer-edge and outer provider-edge VLAN tags using QinQ translation.
	<b>class-map</b>	Accesses the QoS class map configuration mode to configure QoS class maps.
	<b>mode dot1q-in-dot1q access-gateway</b>	Enables a Gigabit Ethernet WAN interface to act as a gateway for QinQ VLAN translation.
	<b>policy-map</b>	Accesses QoS policy-map configuration mode to configure the QoS policy map.
	<b>service-policy</b>	Attaches a policy map to an interface.
	<b>set cos cos-inner (policy-map configuration)</b>	Sets the 802.1Q prioritization bits in the trunk VLAN tag of a QinQ-translated outgoing packet with the priority value from the inner customer-edge VLAN tag.
	<b>show cwtlc qinq</b>	Displays the information that is related to QinQ translation and is contained in the XCM on board the supervisor engine.
	<b>show policy-map</b>	Displays information about the policy map.
	<b>show policy-map interface</b>	Displays the statistics and the configurations of the input and output policies that are attached to an interface.

# show dot1q-tunnel

To display a list of 802.1Q tunnel-enabled ports, use the **showdot1q-tunnel** command in user EXEC mode.

**show dot1q-tunnel** [**interface** *interface interface-number*]

## Syntax Description

<b>interface</b> <i>interface</i>	(Optional) Specifies the interface type; possible valid values are <b>ethernet</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>port-channel</b> , and <b>ge-wan</b> .
<i>interface-number</i>	(Optional) Interface number; see the “Usage Guidelines” section for valid values.

## Command Modes

User EXEC (>)

## Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

## Usage Guidelines

If you do not enter any keywords, the 802.1Q tunnel ports for all interfaces are displayed.

The **ge-wan** keyword is not supported in Cisco 7600 series routers that are configured with a Supervisor Engine 720.

The *interface-number* argument designates the module and port number for the **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, and **ge-wan** keywords. Valid values depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

The *interface-number* argument designates the port-channel number for the **port-channel** keyword; valid values are from 1 to 282. The values from 257 to 282 are supported on the Content Switching Module (CSM) and the Firewall Services Module (FWSM) only.

## Examples

This example indicates that the port is up and has one 802.1Q tunnel that is configured on it. The fields shown in the display are self-explanatory.

```
Router# show dot1q-tunnel interface port-channel 10
Interface
-----
Po10
```

## Related Commands

Command	Description
<b>switchport mode</b>	Sets the interface type.
<b>vlan dot1q tag native</b>	Enables dot1q tagging for all VLANs in a trunk.

## show errdisable flap-values

To display conditions that cause a flap error to be recognized as a result of a specific cause, use the **showerrdisableflap-values** command in user EXEC or privileged EXEC mode.

### show errdisable flap-values

#### Syntax Description

This command has no arguments or keywords.

#### Command Modes

User EXEC (>) Privileged EXEC (#)

#### Command History

Release	Modification
15.0(1)	This command was introduced in a release earlier than Cisco IOS Release 15.0(1) on the Cisco 3845 series routers.

#### Usage Guidelines

The Flaps column in the display shows how many changes to the state within the specified time interval will cause an error to be detected and a port to be disabled. For example, the display in the “Examples” section shows that an error will be assumed and the port shut down if three Dynamic Trunking Protocol (DTP)-state (port mode access/trunk) or Port Aggregation Protocol (PAgP) flap changes occur during a 30-second interval, or if 5 link-state (link up/down) changes occur during a 10-second interval.

#### Examples

The following is sample output from the **showerrdisableflap-values** command:

```
Router# show errdisable flap-values

ErrDisable Reason    Flaps    Time (sec)
-----
pagp-flap            3         30
dtp-flap              3         30
link-flap            20         10
```

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

**Table 16: show errdisable flap-values Field Descriptions**

Field	Description
ErrDisable Reason	Reason for error disable.
Flaps	Total number of flaps.
Time (sec)	Time set for the recovery timer, in seconds.
pagp-flap	PAgP flap error disable.
dtp-flap	DTP flap error disable.
link-flap	Link flap error disable.

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>errdisable detect cause</b>	Enables the error-disabled detection for a specific cause or all causes.
<b>errdisable recovery</b>	Configures the recovery mechanism variables.



# show gvrp interface

To display Generic VLAN Registration (GVRP) interface states, use the **showgvrpinterface** command in privileged EXEC mode.

## show gvrp interface

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

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(33)SRB	This command was introduced.

**Usage Guidelines** Use this command to obtain GVRP interface details of the administrative and operational GVRP states of all or one particular .1Q trunk port in the device.

## Examples

The following example shows sample summary output:

```
Router# show gvrp interface

Port      Status   Mode           Registrar State
Fa3/1     on       slow compact   normal
Gi6/13    on       fast compact   normal
Gi6/14    on       fast compact   normal
Port      Transmit Timeout  Leave Timeout  Leaveall Timeout
Fa3/1     200                600            10000
Gi6/13    200                600            10000
Gi6/14    200                600            10000
Port      Vlans Declared
Fa3/1     1,1200,4000,4094
Gi6/13    2-40,100,200,1200,4000,4094
Gi6/14    1200,4000,4094
Port      Vlans Registered
Fa3/1     1-40,100,200
Gi6/13    1,10
Gi6/14    1-40,100,200
Port      Vlans Registered and in Spanning Tree Forwarding State
Fa3/1     1
Gi6/13    10
Gi6/14    none
```

## Related Commands

Command	Description
show gvrp summary	Displays the GVRP configuration at the device leve.

# show gvrp summary

To display the Generic VLAN Registration Protocol (GVRP) configuration, use the **showgvrpsummary** command in privileged EXEC mode.

**show gvrp summary**

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

**Command Modes** Privileged EXEC (#)

Release	Modification
12.2(33)SRB	This command was introduced.

**Usage Guidelines** Use this command to obtain GVRP VLAN configuration details.

**Examples** The following example shows sample summary output. The fields shown in the display are self-explanatory.

```
Router# show
  gvrp
  summary
GVRP global state           : enabled
GVRP VLAN creation         : disabled
VLANs created via GVRP     : 41-99, 1201-4094
```

Command	Description
<b>show gvrp interface</b>	Displays details of the administrative and operational GVRP states of all or one particular .1Q trunk port in the device.

## show mac-address-table

To display the MAC address table, use the **show mac-address-table** command in privileged EXEC mode.

### Cisco 2600, 3600, and 3700 Series Routers

```
show mac-address-table [{secure | self | count}][{addressmacaddress}][{interface type/number}]{fa |
gislot/port}[{atmslot/port}][{atmslot/port }][{vlanvlan-id}]
```

### Catalyst 4500 Series Switches

```
show mac-address-table {assigned | ip | ipx | other}
```

### Catalyst 6000/6500 Series Switches and 7600 Series Routers

```
show mac-address-table [ address mac-addr [all | interface type/number | module number | vlan
vlan-id ] | aging-time [vlan vlan-id ] | count[module number | vlan vlan-id ] | interface type/number | limit
[vlan vlan-id | module number | interface type] | module number | multicast [ count] | igmp-snooping
| mld-snooping | user ][vlan vlan-id ] | notification {mac-move[counter[vlan]] | threshold |
change}[interface [number]] | synchronize statistics | unicast-flood | vlan vlan-id [{all | module
number}]]
```

### Syntax Description

<b>secure</b>	(Optional) Displays only the secure addresses.
<b>self</b>	(Optional) Displays only addresses added by the switch itself.
<b>count</b>	(Optional) Displays the number of entries that are currently in the MAC address table.
<b>address mac-addr</b>	(Optional) Displays information about the MAC address table for a specific MAC address. See the <a href="#">Usage Guidelines</a> section for formatting information.
<b>interface type / number</b>	(Optional) Displays addresses for a specific interface. For the Catalyst 6500 and 6000 series switches, valid values are <b>atm</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , and <b>port-channel</b> . For the Cisco 7600 series, valid values are <b>atm</b> , <b>ethernet</b> , <b>fastethernet</b> , <b>ge-wan</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , and <b>pos</b> .
<b>fa</b>	(Optional) Specifies the Fast Ethernet interface.
<b>gi</b>	(Optional) Specifies the Gigabit Ethernet interface.
<i>slot / port</i>	(Optional) Adds dynamic addresses to the module in slot 1 or 2. The slash mark is required.
<b>atm slot /port</b>	(Optional) Adds dynamic addresses to ATM module <i>slot /port</i> . Use 1 or 2 for the slot number. Use 0 as the port number. The slash mark is required.
<b>vlan vlan -id</b>	(Optional) Displays addresses for a specific VLAN. For the Cisco 2600, 3600, and 3700 series, valid values are from 1 to 1005; do not enter leading zeroes. Beginning with Cisco IOS Release 12.4(15)T, the valid VLAN ID range is from 1 to 4094.  For the Catalyst 6500 and 6000 series switches and 7600 series, valid values are from 1 to 4094.

<b>assigned</b>	Specifies the assigned protocol entries.
<b>ip</b>	Specifies the IP protocol entries.
<b>ipx</b>	Specifies the IPX protocol entries.
<b>other</b>	Specifies the other protocol entries.
<b>all</b>	(Optional) Displays every instance of the specified MAC address in the forwarding table.
<i>type / number</i>	(Optional) Module and interface number.
<b>module</b> <i>number</i>	(Optional) Displays information about the MAC address table for a specific Distributed Forwarding Card (DFC) module.
<b>aging-time</b>	(Optional) Displays the aging time for the VLANs.
<b>limit</b>	Displays MAC-usage information.
<b>multicast</b>	Displays information about the multicast MAC address table entries only.
<b>igmp-snooping</b>	Displays the addresses learned by Internet Group Management Protocol (IGMP) snooping.
<b>mld-snooping</b>	Displays the addresses learned by Multicast Listener Discover version 2 (MLDv2) snooping.
<b>user</b>	Displays the manually entered (static) addresses.
<b>notification mac-move</b>	Displays the MAC-move notification status.
<b>notification mac-move counter</b>	(Optional) Displays the number of times a MAC has moved and the number of these instances that have occurred in the system.
<i>vlan</i>	(Optional) Specifies a VLAN to display. For the Catalyst 6500 and 6000 series switches and 7600 series, valid values are from 1 to 4094.
<b>notification threshold</b>	Displays the Counter-Addressable Memory (CAM) table utilization notification status.
<b>notification change</b>	Displays the MAC notification parameters and history table.
<b>synchronize statistics</b>	Displays information about the statistics collected on the switch processor or DFC.
<b>unicast-flood</b>	Displays unicast-flood information.

**Command Modes**

Privileged EXEC (#)

**Command History**

Release	Modification
11.2(8)SA	This command was introduced.

Release	Modification
11.2(8)SA3	This command was modified. The <b>aging-time</b> ,, <b>count</b> , <b>self</b> , and <b>vlan vlan -id</b> keywords and arguments were added.
11.2(8)SA5	This command was modified. The <b>atmslot/port</b> keyword-argument pair was added.
12.2(2)XT	This command was modified. This command was implemented on Cisco 2600, 3600, and 3700 series routers.
12.1(8a)EW	This command was modified. This command was implemented on Catalyst 4500 series switches.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T on Cisco 2600, 3600, and 3700 series routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.
12.2(14)SX	This command was modified. This command was implemented on the Supervisor Engine 720.
12.2(17a)SX	This command was modified. For the Catalyst 6500 and 6000 series switches and 7600 series, this command was changed to support the following optional keywords and arguments: <ul style="list-style-type: none"> <li>• <b>count module number</b></li> <li>• <b>limit [vlan vlan-id   port number   interface interface-type]</b></li> <li>• <b>notification threshold</b></li> <li>• <b>unicast-flood</b></li> </ul>
12.2(17d)SXB	This command was modified. Support for this command was added for the Supervisor Engine 2.
12.2(18)SXE	This command was modified. For the Catalyst 6500 and 6000 series switches and Cisco 7600 series, support was added for the <b>mld-snooping</b> keyword on the Supervisor Engine 720 only.
12.2(18)SXF	This command was modified. For the Catalyst 6500 and 6000 series switches and Cisco 7600 series, support was added for the <b>synchronizestatistics</b> keywords on the Supervisor Engine 720 only.
12.2(33)SRA	This command was modified. This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(15)T	This command was modified to extend the range of valid VLAN IDs to 1 to 4094 for specified platforms.
12.2(33)SXH	This command was modified. The <b>change</b> keyword was added.
12.2(33)SXI	This command was modified to add the <b>counter</b> keyword.
15.4(2)S	This command was implemented on the Cisco ASR 901 Series Aggregation Services Router.

**Usage Guidelines**

Cisco 2600, 3600, and 3700 Series Routers

The **show mac-address-table** command displays the MAC address table for the switch. Specific views can be defined by using the optional keywords and arguments. If more than one optional keyword is used, then all the conditions must be true for that entry to be displayed.

**Catalyst 4500 Series Switches**

For the MAC address table entries that are used by the routed ports, the routed port name, rather than the internal VLAN number, is displayed in the **vlan** column.

**Catalyst 6000 and 6500 Series Switches and Cisco 7600 Series Routers**

If you do not specify a module number, the output of the **show mac-address-table** command displays information about the supervisor engine. To display information about the MAC address table of the DFCs, you must enter the module number or the **all** keyword.

The *mac-addr* value is a 48-bit MAC address. The valid format is H.H.H.

The interface *number* argument designates the module and port number. Valid values depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

The optional **module number** keyword-argument pair is supported only on DFC modules. The **module number** keyword-argument pair designate the module number.

Valid values for the *mac-group-address* argument are from 1 to 9.

The optional **count** keyword displays the number of multicast entries.

The optional **multicast** keyword displays the multicast MAC addresses (groups) in a VLAN or displays all statically installed or IGMP snooping-learned entries in the Layer 2 table.

The information that is displayed in the show mac-address-table unicast-flood command output is as follows:

- Up to 50 flood entries, shared across all the VLANs that are not configured to use the filter mode, can be recorded.
- The output field displays are defined as follows:
  - ALERT--Information is updated approximately every 3 seconds.
  - SHUTDOWN--Information is updated approximately every 3 seconds.

**Note**

The information displayed on the destination MAC addresses is deleted as soon as the floods stop after the port shuts down.

- Information is updated each time that you install the filter. The information lasts until you remove the filter.

The dynamic entries that are displayed in the Learn field are always set to Yes.

The **show mac-address-table limit** command output displays the following information:

- The current number of MAC addresses.
- The maximum number of MAC entries that are allowed.

- The percentage of usage.

The show mac-address-table synchronize statistics command output displays the following information:

- Number of messages processed at each time interval.
- Number of active entries sent for synchronization.
- Number of entries updated, created, ignored, or failed.

## Examples

The following is sample output from the `show mac-address-table` command:

```
Switch# show mac-address-table

Dynamic Addresses Count:          9
Secure Addresses (User-defined) Count: 0
Static Addresses (User-defined) Count: 0
System Self Addresses Count:     41
Total MAC addresses:             50
Non-static Address Table:
Destination Address  Address Type  VLAN  Destination Port
-----
0010.0de0.e289      Dynamic      1    FastEthernet0/1
0010.7b00.1540      Dynamic      2    FastEthernet0/5
0010.7b00.1545      Dynamic      2    FastEthernet0/5
0060.5cf4.0076      Dynamic      1    FastEthernet0/1
0060.5cf4.0077      Dynamic      1    FastEthernet0/1
0060.5cf4.1315      Dynamic      1    FastEthernet0/1
0060.70cb.f301      Dynamic      1    FastEthernet0/1
00e0.1e42.9978      Dynamic      1    FastEthernet0/1
00e0.1e9f.3900      Dynamic      1    FastEthernet0/1
```

## Catalyst 4500 Series Switches

The following example shows how to display the MAC address table entries that have a specific protocol type (in this case, “assigned”):

```
Switch# show mac-address-table protocol assigned

vlan  mac address      type      protocol  qos      ports
-----+-----+-----+-----+-----+-----
200  0050.3e8d.6400  static   assigned  --  Switch
100  0050.3e8d.6400  static   assigned  --  Switch
5    0050.3e8d.6400  static   assigned  --  Switch
4092 0000.0000.0000  dynamic  assigned  --  Switch
1    0050.3e8d.6400  static   assigned  --  Switch
4    0050.3e8d.6400  static   assigned  --  Switch
4092 0050.f0ac.3058  static   assigned  --  Switch
4092 0050.f0ac.3059  dynamic  assigned  --  Switch
1    0010.7b3b.0978  dynamic  assigned  --  Fa5/9
```

The following example shows the “other” output for the previous example:

```
Switch# show mac-address-table protocol other

Unicast Entries
```

```

vlan  mac address      type      protocols      port
-----+-----+-----+-----+-----
  1    0000.0000.0201    dynamic  other          FastEthernet6/15
  1    0000.0000.0202    dynamic  other          FastEthernet6/15
  1    0000.0000.0203    dynamic  other          FastEthernet6/15
  1    0000.0000.0204    dynamic  other          FastEthernet6/15
  1    0030.94fc.0dff     static   ip,ipx,assigned,other  Switch
  2    0000.0000.0101    dynamic  other          FastEthernet6/16
  2    0000.0000.0102    dynamic  other          FastEthernet6/16
  2    0000.0000.0103    dynamic  other          FastEthernet6/16
  2    0000.0000.0104    dynamic  other          FastEthernet6/16
Fa6/1  0030.94fc.0dff     static   ip,ipx,assigned,other  Switch
Fa6/2  0030.94fc.0dff     static   ip,ipx,assigned,other  Switch
Multicast Entries
vlan  mac address      type      ports
-----+-----+-----+-----
  1    ffff.ffff.ffff    system   Switch, Fa6/15
  2    ffff.ffff.ffff    system   Fa6/16
1002  ffff.ffff.ffff    system
1003  ffff.ffff.ffff    system
1004  ffff.ffff.ffff    system
1005  ffff.ffff.ffff    system
Fa6/1  ffff.ffff.ffff    system   Switch, Fa6/1
Fa6/2  ffff.ffff.ffff    system   Switch, Fa6/2

```

### Catalyst 6000 and 6500 Series Switches and Cisco 7600 Series Routers

The following is sample output from the `show mac-address-table` command:

```

Switch# show mac-address-table

Dynamic Addresses Count:          9
Secure Addresses (User-defined) Count: 0
Static Addresses (User-defined) Count: 0
System Self Addresses Count:     41
Total MAC addresses:             50
Non-static Address Table:
Destination Address  Address Type  VLAN  Destination Port
-----+-----+-----+-----
0010.0de0.e289      Dynamic      1     FastEthernet0/1
0010.7b00.1540      Dynamic      2     FastEthernet0/5
0010.7b00.1545      Dynamic      2     FastEthernet0/5
0060.5cf4.0076      Dynamic      1     FastEthernet0/1
0060.5cf4.0077      Dynamic      1     FastEthernet0/1
0060.5cf4.1315      Dynamic      1     FastEthernet0/1
0060.70cb.f301      Dynamic      1     FastEthernet0/1
00e0.1e42.9978      Dynamic      1     FastEthernet0/1
00e0.1e9f.3900      Dynamic      1     FastEthernet0/1

```



**Note** In a distributed Encoded Address Recognition Logic (EARL) switch, the asterisk (\*) indicates a MAC address that is learned on a port that is associated with this EARL.

The following example shows how to display the information about the MAC address table for a specific MAC address with a Supervisor Engine 720:

```

Switch# show mac-address-table address 001.6441.60ca

```



```

Codes: * - primary entry
      vlan  mac address      type  learn qos      ports
-----+-----+-----+-----+-----+-----
Supervisor:
* --- 0001.6441.60ca  static No  -- Router

```

The following example shows how to display MAC address table information for a specific MAC address with a Supervisor Engine 720:

```

Router# show mac-address-table address 0100.5e00.0128

Legend: * - primary entry
      age - seconds since last seen
      n/a - not available
      vlan  mac address      type  learn  age      ports
-----+-----+-----+-----+-----+-----
Supervisor:
* 44 0100.5e00.0128  static Yes  - Fa6/44,Router
* 1 0100.5e00.0128  static Yes  - Router
Module 9:
* 44 0100.5e00.0128  static Yes  - Fa6/44,Router
* 1 0100.5e00.0128  static Yes  - Router

```

The following example shows how to display the currently configured aging time for all VLANs:

```

Switch# show mac-address-table aging-time

Vlan    Aging Time
----    -
*100    300
200     1000

```

The following example shows how to display the entry count for a specific slot:

```

Switch# show mac-address-table count module 1

MAC Entries on slot 1 :
Dynamic Address Count:          4
Static Address (User-defined) Count: 25
Total MAC Addresses In Use:     29
Total MAC Addresses Available:  131072

```

The following example shows how to display the information about the MAC address table for a specific interface with a Supervisor Engine 720:

```

Switch# show mac-address-table interface fastethernet 6/45

Legend: * - primary entry
      age - seconds since last seen
      n/a - not available
      vlan  mac address      type  learn  age      ports
-----+-----+-----+-----+-----+-----
* 45 00e0.f74c.842d  dynamic Yes  5 Fa6/45

```



**Note** A leading asterisk (\*) indicates entries from a MAC address that was learned from a packet coming from an outside device to a specific module.

The following example shows how to display the limit information for a specific slot:

```
Switch# show mac-address-table limit vlan 1 module 1
```

vlan	switch	module	action	maximum	Total entries	flooding
1	1	7	warning	500	0	enabled
1	1	11	warning	500	0	enabled
1	1	12	warning	500	0	enabled

```
Router# show mac-address-table limit vlan 1 module 2
```

vlan	switch	module	action	maximum	Total entries	flooding
1	2	7	warning	500	0	enabled
1	2	9	warning	500	0	enabled

The following example shows how to display the MAC-move notification status:

```
Switch# show mac-address-table notification mac-move
```

```
MAC Move Notification: Enabled
```

The following example shows how to display the MAC move statistics:

```
Router# show mac-address-table notification mac-move counter
```

```
-----
Vlan Mac Address From Mod/Port To Mod/Port Count
-----
1 00-01-02-03-04-01 2/3 3/1 10
20 00-01-05-03-02-01 5/3 5/1 20
-----
```

The following example shows how to display the CAM-table utilization-notification status:

```
Router# show mac-address-table notification threshold
```

```
Status limit Interval
-----+-----+-----
enabled 1 120
```

The following example shows how to display the MAC notification parameters and history table:

```
Switch# show mac-address-table notification change
```

```
MAC Notification Feature is Disabled on the switch
MAC Notification Flags For All Ethernet Interfaces :
-----
Interface                               MAC Added Trap MAC Removed Trap
```

The following example shows how to display the MAC notification parameters and history table for a specific interface:

```
Switch# show mac-address-table notification change interface gigabitethernet5/2

MAC Notification Feature is Disabled on the switch
Interface          MAC Added Trap  MAC Removed Trap
-----
GigabitEthernet5/2  Disabled        Disabled
```

The following example shows how to display unicast-flood information:

```
Switch# show mac-address-table unicast-flood

>> Unicast Flood Protection status: enabled
>>
>> Configuration:
>> vlan Kfps action timeout
>> -----+-----+-----+-----+-----
>> 2 2 alert none
>>
>> Mac filters:
>> No. vlan source mac addr. installed
>> on time left (mm:ss)
>>
>> -----+-----+-----+-----+-----
>>
>> Flood details:
>> Vlan source mac addr. destination mac addr.
>>
>> -----+-----+-----+-----+-----
>> 2 0000.0000.cafe 0000.0000.bad0, 0000.0000.babe,
>> 0000.0000.bac0
>> 0000.0000.bac2, 0000.0000.bac4,
>> 0000.0000.bac6
>> 0000.0000.bac8
>> 2 0000.0000.caff 0000.0000.bad1, 0000.0000.babf,
>> 0000.0000.bac1
>> 0000.0000.bac3, 0000.0000.bac5,
>> 0000.0000.bac7
>> 0000.0000.bac9
```

The following example shows how to display the information about the MAC-address table for a specific VLAN:

```
Switch#show mac-address-table vlan 100

vlan  mac address      type      protocol  qos      ports
-----+-----+-----+-----+-----+-----
100  0050.3e8d.6400  static   assigned  --  Router
100  0050.7312.0cff  dynamic      ip  --  Fa5/9
100  0080.1c93.8040  dynamic      ip  --  Fa5/9
100  0050.3e8d.6400  static      ipx  --  Router
100  0050.3e8d.6400  static      other --  Router
100  0100.0cdd.dddd  static      other --  Fa5/9,Router,Switch
100  00d0.5870.a4ff  dynamic      ip  --  Fa5/9
100  00e0.4fac.b400  dynamic      ip  --  Fa5/9
```

```

100 0100.5e00.0001 static ip -- Fa5/9,Switch
100 0050.3e8d.6400 static ip -- Router

```

The following example shows how to display the information about the MAC address table for MLDv2 snooping:

```
Switch# show mac-address-table multicast mld-snooping
```

```

vlan mac address type learn qos ports
-----+-----+-----+-----+-----+-----
--- 3333.0000.0001 static Yes - Switch,Stby-Switch
--- 3333.0000.000d static Yes - Fa2/1,Fa4/1,Router,Switch
--- 3333.0000.0016 static Yes - Switch,Stby-Switch

```

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

**Table 17: show mac-address-table Field Descriptions**

Field	Description
Dynamic Addresses Count	Total number of dynamic addresses in the MAC address table.
Secure Addresses (User-defined) Count	Total number of secure addresses in the MAC address table.
Static Addresses (User-defined) Count	Total number of static addresses in the MAC address table.
System Self Addresses Count	Total number of addresses in the MAC address table.
Total MAC addresses	Total MAC addresses in the MAC address table.
Destination Address	Destination addresses present in the MAC address table.
Address Type	Address type: static or dynamic.
VLAN	VLAN number.
Destination Port	Destination port information present in the MAC address table.
mac address	The MAC address of the entry.
protocol	Protocol present in the MAC address table.
qos	Quality of service associated with the MAC address table.
ports	Port type.
age	The time in seconds since last occurrence of the interface.
Aging Time	Aging time for entries.
module	Module number.
action	Type of action.
flooding	Status of the flooding.

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>clear mac-address-table</b>	Deletes entries from the MAC address table.
<b>mac-address-table aging-time</b>	Configures the aging time for entries in the Layer 2 table.
<b>mac-address-table limit</b>	Enables MAC limiting.
<b>mac-address-table notification mac-move</b>	Enables MAC-move notification.
<b>mac-address-table static</b>	Adds static entries to the MAC address table or configures a static MAC address with IGMP snooping disabled for that address.
<b>mac-address-table synchronize</b>	Synchronizes the Layer 2 MAC address table entries across the PFC and all the DFCs.
<b>show mac-address-table static</b>	Displays only static MAC address table entries.

## show mac-address-table aging-time

To display the MAC address aging time, use the **show mac-address-table aging-time** command in privileged EXEC mode.

### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

**show mac-address-table aging-time**

### Catalyst Switches

**show mac-address-table aging-time** [**vlan** *vlan-id*] [{**begin** | **exclude** | **include**}] *expression*

### Cisco ME 2600X Series Ethernet Access Switches

**show mac-address-table aging-time** [**bridge-domain** *bridge-domain-id*]

#### Syntax Description

<b>vlan</b> <i>vlan-id</i>	(Optional) Specifies a VLAN; valid values are from 1 to 1005.
<b>begin</b>	(Optional) Specifies that the output display begin with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Specifies that the output display exclude lines that match the <i>expression</i> .
<b>include</b>	(Optional) Specifies that the output display include lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.
<b>bridge-domain</b> <i>bridge-domain-id</i>	(Optional) Specifies a bridge-domain; valid values are from 1 to 16384.

#### Command Modes

Privileged EXEC (#)

#### Command History

Release	Modification
12.0(7)XE	This command was introduced on Catalyst 6000 series switches.
12.2(2)XT	This command was implemented on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

## Examples

The following example shows how to display the current configured aging time for all VLANs. The fields shown in the display are self-explanatory.

### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

```
Router# show mac-address-table aging-time
Mac address aging time 300
```

### Catalyst Switches

```
Router# show mac-address-table aging-time
Vlan    Aging Time
----    -
100     300
200     1000
```

The following example shows how to display the current configured aging time for a specific VLAN. The fields shown in the display are self-explanatory.

```
Router# show mac-address-table aging-time vlan 100
Vlan    Aging Time
----    -
100     300
```

## Related Commands

Command	Description
<b>show mac -address-tableaddress</b>	Displays MAC address table information for a specific MAC address.
<b>show mac -address-tablecount</b>	Displays the number of entries currently in the MAC address table.
<b>show mac -address-tabledetail</b>	Displays detailed MAC address table information.
<b>show mac -address-tabledynamic</b>	Displays dynamic MAC address table entries only.
<b>show mac -address-tableinterface</b>	Displays the MAC address table information for a specific interface.
<b>show mac -address-tablemulticast</b>	Displays multicast MAC address table information.
<b>show mac -address-tableprotocol</b>	Displays MAC address table information based on protocol.
<b>show mac -address-tablestatic</b>	Displays static MAC address table entries only.
<b>show mac -address-tablevlan</b>	Displays the MAC address table information for a specific VLAN.

## show mac-address-table dynamic

To display dynamic MAC address table entries only, use the **showmac-address-tabledynamic** command in privileged EXEC mode.

### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

**show mac-address-table dynamic** [{address *mac-addr* | interface *interface type slot/number* | vlan *vlan*}]

### Catalyst Switches

**show mac-address-table dynamic** [{address *mac-addr* | detail | interface *interface number* protocol *protocol* | module *number* | vlan *vlan*}] [{begin | exclude | include *expression*}]

### Catalyst 6500 Series Switches

**show mac-address-table dynamic** [{address *mac-addr* | interface *interface interface-number* [{all | module *number*}] | module *num* | vlan *vlan-id* [{all | module *number*}]}

#### Syntax Description

<b>address</b> <i>mac-address</i>	(Optional) Specifies a 48-bit MAC address; valid format is H.H.H.
<b>detail</b>	(Optional) Specifies a detailed display of MAC address table information.
<b>interface</b> <i>type number</i>	(Optional) Specifies an interface to match; valid type values are FastEthernet and GigabitEthernet, valid number values are from 1 to 9.
<b>interface</b> <i>type</i>	(Optional) Specifies an interface to match; valid type values are FastEthernet and GigabitEthernet.
<i>slot</i>	(Optional) Adds dynamic addresses to module in slot 1 or 2.
<i>port</i>	(Optional) Port interface number ranges based on type of Ethernet switch network module used: <ul style="list-style-type: none"> <li>• 0 to 15 for NM-16ESW</li> <li>• 0 to 35 for NM-36ESW</li> <li>• 0 to 1 for GigabitEthernet</li> </ul>
<b>protocol</b> <i>protocol</i>	(Optional) Specifies a protocol. See the “Usage Guidelines” section for keyword definitions.
<b>module</b> <i>number</i>	(Optional) Displays information about the MAC address table for a specific Distributed Forwarding Card (DFC) module.
<b>vlan</b> <i>vlan</i>	(Optional) Displays entries for a specific VLAN; valid values are from 1 to 1005.
<b>begin</b>	(Optional) Specifies that the output display begin with the line that matches the expression.
<b>exclude</b>	(Optional) Specifies that the output display exclude lines that match the expression.



<b>include</b>	(Optional) Specifies that the output display include lines that match the specified expression.
<i>expression</i>	Expression in the output to use as a reference point.
<b>all</b>	(Optional) Specifies that the output display all dynamic MAC-address table entries.

**Command Modes**

Privileged EXEC (#)

**Command History**

Release	Modification
12.0(7)XE	This command was introduced on Catalyst 6000 series switches.
12.2(2)XT	This command was implemented on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(14)SX	Support for this command was introduced on the Catalyst 6500 series switch.
12.2(33)SXH	This command was changed to support the <b>all</b> keyword on the Catalyst 6500 series switch.

**Usage Guidelines****Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers**

The **showmac-address-tabledynamic** command output for an EtherChannel interface changes the port-number designation (for example, 5/7) to a port-group number.

**Catalyst Switches**

The keyword definitions for the protocol argument are:

- **ip** --Specifies IP protocol
- **ipx** --Specifies Internetwork Packet Exchange (IPX) protocols
- **assigned** --Specifies assigned protocol entries
- **other** --Specifies other protocol entries

The **showmac-address-tabledynamic** command output for an EtherChannel interface changes the port-number designation (for example, 5/7) to a port-group number.

**Catalyst 6500 Series Switches**

The *mac-address* is a 48-bit MAC address and the valid format is H.H.H.

The optional **module** keyword and argument are supported only on DFC modules. The **module** keyword and argument designate the module number.

**Examples**

The following examples show how to display all dynamic MAC address entries. The fields shown in the various displays are self-explanatory.

## Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

```
Router# show mac-address-table dynamic
```

```
Non-static Address Table:
Destination Address  Address Type  VLAN  Destination Port
-----
000a.000a.000a      Dynamic      1     FastEthernet4/0
002a.2021.4567      Dynamic      2     FastEthernet4/0
```

## Catalyst Switches

```
Router# show mac-address-table dynamic
```

```
vlan  mac address  type  protocol  qos  ports
-----+-----+-----+-----+-----+-----
200  0010.0d40.37ff  dynamic  ip  --  5/8
1    0060.704c.73ff  dynamic  ip  --  5/9
4095 0000.0000.0000  dynamic  ip  --  15/1
1    0060.704c.73fb  dynamic  other --  5/9
1    0080.1c93.8040  dynamic  ip  --  5/9
4092 0050.f0ac.3058  dynamic  ip  --  15/1
1    00e0.4fac.b3ff  dynamic  other --  5/9
```

The following example shows how to display dynamic MAC address entries with a specific protocol type (in this case, assigned).

```
Router# show mac-address-table dynamic protocol assigned
```

```
vlan  mac address  type  protocol  qos  ports
-----+-----+-----+-----+-----+-----
4092 0000.0000.0000  dynamic  assigned  --  Router
4092 0050.f0ac.3059  dynamic  assigned  --  Router
1    0010.7b3b.0978  dynamic  assigned  --  Fa5/9
Router#
```

The following example shows the detailed output for the previous example.

```
Router# show mac-address-table dynamic protocol assigned detail
```

```
MAC Table shown in details
=====
Type  Always Learn Trap Modified Notify Capture Protocol Flood
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
QoS bit  L3 Spare  Mac Address  Age Byte Pvlan Xtag SWbits Index
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
DYNAMIC  NO        NO          YES        NO        NO        assigned  NO
Bit Not On  0        0000.0000.0000  255      4092  0        0        0x3
DYNAMIC  NO        NO          YES        NO        NO        assigned  NO
Bit Not On  0        0050.f0ac.3059  254      4092  0        0        0x3
DYNAMIC  NO        NO          YES        NO        NO        assigned  NO
Bit Not On  0        0010.7b3b.0978  254      1      0        0        0x108
Router#
```

## Catalyst 6500 Series Switches

This example shows how to display all the dynamic MAC-address entries for a specific VLAN.

```
Router# show mac-address-table dynamic vlan 200 all
Legend: * - primary entry
       age - seconds since last seen
       n/a - not available
vlan   mac address      type   learn   age           ports
-----+-----+-----+-----+-----+-----
 200   0010.0d40.37ff    dynamic NO      23           Gi5/8
Router#
```

This example shows how to display all the dynamic MAC-address entries.

```
Router# show mac-address-table dynamic
Legend: * - primary entry
       age - seconds since last seen
       n/a - not applicable
vlan   mac address      type   learn   age           ports
-----+-----+-----+-----+-----+-----
* 10   0010.0000.0000    dynamic Yes    n/a          Gi4/1
* 3    0010.0000.0000    dynamic Yes    0           Gi4/2
* 1    0002.fcbc.ac64    dynamic Yes    265         Gi8/1
* 1    0009.12e9.adc0    static  No      -            Router
Router#
```

### Related Commands

Command	Description
<b>show mac -address-tableaddress</b>	Displays MAC address table information for a specific MAC address.
<b>show mac -address-tableaging-time</b>	Displays the MAC address aging time.
<b>show mac -address-tablecount</b>	Displays the number of entries currently in the MAC address table.
<b>show mac -address-tabledetail</b>	Displays detailed MAC address table information.
<b>show mac -address-tableinterface</b>	Displays the MAC address table information for a specific interface.
<b>show mac -address-tablemulticast</b>	Displays multicast MAC address table information.
<b>show mac -address-tableprotocol</b>	Displays MAC address table information based on protocol.
<b>show mac -address-tablestatic</b>	Displays static MAC address table entries only.
<b>show mac -address-tablevlan</b>	Displays the MAC address table information for a specific VLAN.

# show mac-address-table learning

To display the MAC-address learning state, use the **showmac-address-tablelearning** command in user EXEC mode.

**show mac-address-table learning**[ {vlan} ]

Syntax Description		
<b>vlan</b> <i>vlan-id</i>		(Optional) Displays information about the MAC-address learning state for the specified switch port VLAN; valid values are from 1 to 4094.
<b>interface</b> <i>interface slot / port</i>		(Optional) Displays information about the MAC-address learning state for the specified routed interface type, the slot number, and the port number.
<b>module</b> <i>num</i>		(Optional) Displays information about the MAC-address learning state for the specified module number.

**Command Default** This command has no default settings.

**Command Modes** User EXEC (>)

Command History	Release	Modification
	12.2(18)SXE	Support for this command was introduced on the Supervisor Engine 720.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

**Usage Guidelines** The **module***num* keyword and argument can be used to specify supervisor engines or Distributed Forwarding Cards (DFCs) only.

The **interface***interfaceslot/port* keyword and arguments can be used on routed interfaces only. The **interface***interfaceslot/port* keyword and arguments cannot be used to configure learning on switch-port interfaces.

If you specify the **vlan***vlan-id*, the state of the MAC-address learning of the specified VLAN, including router interfaces, on all modules, is displayed.

If you specify the **vlan***vlan-id* and the **module***num*, the state of the MAC-address learning of a specified VLAN on a specified module is displayed.

If you specify the **interface***interfaceslot/port* keyword and arguments, the state of the MAC-address learning of the specified interface on all modules is displayed.

If you specify the **interface***interfaceslot/port* keyword and arguments, the state of the MAC-address learning of the specified interface on the specified module is displayed.

If you enter the **showmac-address-tablelearning** command with no arguments or keywords, the status of MAC learning on all the existing VLANs on all the supervisor engines or DFCs configured on a Cisco 7600 series router is displayed.

## Examples

This example shows how to display the MAC-address learning status on all the existing VLANs on all the supervisor engines or DFCs configured on a Cisco 7600 series router:

```

Router# show mac-address-table learning

VLAN/Interface          Mod1   Mod4   Mod7
-----
1                        yes    yes    yes
100                      yes    yes    yes
150                      yes    yes    yes
200                      yes    yes    yes
250                      yes    yes    yes
1006                    no     no     no
1007                    no     no     no
1008                    no     no     no
1009                    no     no     no
1010                    no     no     no
1011                    no     no     no
1012                    no     no     no
1013                    no     no     no
1014                    no     no     no
GigabitEthernet6/1     no     no     no
GigabitEthernet6/2     no     no     no
GigabitEthernet6/4     no     no     no
FastEthernet3/4        no     no     no
FastEthernet3/5        no     no     no
GigabitEthernet4/1     no     no     no
GigabitEthernet4/2     no     no     no
GigabitEthernet7/1     no     no     no
GigabitEthernet7/2     no     no     no
Router#

```

Table 1 describes the fields that are shown in the example.

**Table 18: show mac-address-table learning Field Descriptions**

Field	Description
VLAN/Interface <sup>1</sup>	VLAN ID or interface type, module, and port number.
Mod#	Module number of a supervisor engine or DFC.
yes	MAC-address learning is enabled.
no	MAC-address learning is disabled.

<sup>1</sup> The interfaces displayed are routed interfaces that have internal VLANs assigned to them.

This example shows how to display the status of MAC-address learning on all the existing VLANs on a single supervisor engine or a DFC:

```

Router# show mac-address-table learning module 4

VLAN/Interface          Mod4
-----
1                        yes
100                      yes
150                      yes
200                      yes
250                      yes
1006                    no
1007                    no
1008                    no

```

```

1009                no
1010                no
1011                no
1012                no
1013                no
1014                no
GigabitEthernet6/1 no
GigabitEthernet6/2 no
GigabitEthernet6/4 no
FastEthernet3/4    no
FastEthernet3/5    no
GigabitEthernet4/1 no
GigabitEthernet4/2 no
GigabitEthernet7/1 no
GigabitEthernet7/2 no
Router#

```

This example shows how to display the status of MAC-address learning for a specific VLAN on all the supervisor engines and DFCs:

```
Router# show mac-address-table learning vlan 100
```

```

VLAN   Mod1   Mod4   Mod7
----   -
100    no     no     yes
Router

```

This example shows how to display the status of MAC-address learning for a specific VLAN on a specific supervisor engine or DFC:

```
Router# show mac-address-table learning vlan 100 module 7
```

```

VLAN   Mod7
----   -
100    yes
Router

```

This example shows how to display the status of MAC-address learning for a specific supervisor engine or DFC:

```
Router# show mac-address-table learning interface FastEthernet 3/4
```

```

Interface      Mod1   Mod4   Mod7
-----
Fa3/4          no     yes    no
Router

```

This example shows how to display the status of MAC-address learning for a specific interface on a specific supervisor engine or DFC:

```
Router# show mac-address-table learning
interface FastEthernet 3/4 module 1
```

```

Interface      Mod1
-----
Fa3/4          no
Router

```

**Related Commands**

Command	Description
mac-address-table learning	Enables MAC-address learning.

## show mac-address-table static

To display static MAC address table entries only, use the **show mac-address-table static** command in privileged EXEC mode.

### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

**show mac-address-table static** [{address *mac-address* | interface *type /slot number* | vlan *vlan-id*}]

### Catalyst Switches

**show mac-address-table static** [{address *mac-address* | detail | interface *type number* | protocol *protocol* | vlan *vlan-id*}] [[begin | exclude | include] *expression*]

#### Syntax Description

<b>address</b> <i>mac-address</i>	(Optional) Specifies a 48-bit MAC address to match; valid format is H.H.H.
<b>detail</b>	(Optional) Specifies a detailed display of MAC address table information.
<b>interface</b> <i>type number</i>	(Optional) Specifies an interface to match; valid type values are Ethernet, FastEthernet, and Gigabit Ethernet and valid number values are from 1 to 9.
<b>interface</b> <i>type</i>	(Optional) Specifies an interface to match; valid type values are FastEthernet and Gigabit Ethernet.
<i>slot</i>	(Optional) Adds dynamic addresses to module in slot 1 or 2.
<i>port</i>	(Optional) Port interface number ranges based on type of Ethernet switch network module used: <ul style="list-style-type: none"> <li>• 0 to 15 for NM-16ESW</li> <li>• 0 to 35 for NM-36ESW</li> <li>• 0 to 1 for Gigabit Ethernet</li> </ul>
<b>protocol</b> <i>protocol</i>	(Optional) Specifies a protocol. See the “Usage Guidelines” section for keyword definitions.
<b>vlan</b> <i>vlan</i>	(Optional) Displays entries for a specific VLAN; valid values are from 1 to 1005.
<b>begin</b>	(Optional) Specifies that the output display begin with the line that matches the expression.
<b>exclude</b>	(Optional) Specifies that the output display exclude lines that match the expression.
<b>include</b>	(Optional) Specifies that the output display include lines that match the expression.
<i>expression</i>	Expression in the output to use as a reference point.

#### Command Modes

Privileged EXEC (#)



Command History	Release	Modification
	12.0(7)XE	This command was introduced on Catalyst 6000 series switches.
	12.2(2)XT	This command was implemented on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

### Usage Guidelines

#### Catalyst Switches

The keyword definitions for the protocol argument are:

- **ip** --Specifies IP protocol
- **ipx** --Specifies Internetwork Packet Exchange (IPX) protocols
- **assigned** --Specifies assigned protocol entries
- **other** --Specifies other protocol entries

### Examples

The following examples show how to display all static MAC address entries. The fields shown in the various displays are self-explanatory.

#### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

```
Router# show mac-address-table static
Static Address Table:
Destination Address  Address Type  VLAN  Destination Port
-----
2323.3214.5432      Static       4     FastEthernet4/1
2323.3214.5431      Static       5     FastEthernet4/1
2323.3214.5432      Static       6     FastEthernet4/1
2323.3214.5434      Static       7     FastEthernet4/1
2323.3214.5435      Static       8     FastEthernet4/1
```

#### Catalyst Switches

```
Router# show mac-address-table static
*Oct 22 12:15:35: %SYS-5-CONFIG_I: Configured from console by console
vlan  mac address  type  protocol  qos  ports
-----+-----+-----+-----+-----+-----
 200  0050.3e8d.6400  static  assigned  --  Router
 100  0050.3e8d.6400  static  assigned  --  Router
4092  0050.f0ac.3058  static   other    --  Router
```

## show mac-address-table static

```

917 0100.0cdd.dddd static other -- Fa5/9,Router,Switch
5 0050.3e8d.6400 static assigned -- Router
303 0100.0cdd.dddd static other -- Fa5/9,Router,Switch
850 0100.0cdd.dddd static other -- Fa5/9,Router,Switch
1002 0100.0cdd.dddd static other -- Fa5/9,Router,Switch
802 0100.0cdd.dddd static other -- Fa5/9,Router,Switch
2 0100.0cdd.dddd static other -- Fa5/9,Router,Switch
304 0100.5e00.0001 static ip -- Fa5/9,Switch
.
.
.

```

The following example shows how to display static MAC address entries with a specific protocol type (in this case, assigned).

```

Router# show mac-address-table static protocol assigned
vlan mac address type protocol qos ports
-----+-----+-----+-----+-----+-----+-----
200 0050.3e8d.6400 static assigned -- Router
100 0050.3e8d.6400 static assigned -- Router
5 0050.3e8d.6400 static assigned -- Router

```

The following example shows the detailed output for the previous example.

```

Router# show mac-address-table static protocol assigned detail
MAC Table shown in details
=====
Type Always Learn Trap Modified Notify Capture Protocol Flood
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
QoS bit L3 Spare Mac Address Age Byte Pvlan Xtag SWbits Index
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
STATIC NO NO NO NO NO assigned NO
Bit Not On 0 0050.3e8d.6400 254 200 1 0 0x3
STATIC NO NO NO NO NO assigned NO
Bit Not On 0 0050.3e8d.6400 254 100 1 0 0x3
STATIC NO NO NO NO NO assigned NO
Bit Not On 0 0050.3e8d.6400 254 5 1 0 0x3
S Bit Not On 0 0050.f0ac.3058 254 4092 1 0 0x3
.
.
.

```

## Cisco 7600 Series Routers

This example shows how to display all the static MAC address entries; this Cisco 7600 series router is configured with a Supervisor Engine 720.

```

Router# show mac-address-table static
Codes: * - primary entry
vlan mac address type learn qos ports
-----+-----+-----+-----+-----+-----+-----
* --- 0001.6441.60ca static No -- Router

```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show mac -address-tableaddress</b>	Displays MAC address table information for a specific MAC address.
<b>show mac -address-tableaging-time</b>	Displays the MAC address aging time.
<b>show mac -address-tablecount</b>	Displays the number of entries currently in the MAC address table.
<b>show mac -address-tabledetail</b>	Displays detailed MAC address table information.
<b>show mac -address-tabledynamic</b>	Displays dynamic MAC address table entries only.
<b>show mac -address-tableinterface</b>	Displays the MAC address table information for a specific interface.
<b>show mac -address-tablemulticast</b>	Displays multicast MAC address table information.
<b>show mac -address-tableprotocol</b>	Displays MAC address table information based on protocol.
<b>show mac -address-tablevlan</b>	Displays the MAC address table information for a specific VLAN.

## show mls df-table

To display information about the multilayer switching (MLS) Don't Fragment (DF) table, use the **showmlsdf-table** command in privileged EXEC mode.

**show mls df-table** *start-vlan end-vlan*

### Syntax Description

<i>start-vlan</i>	Start of a range of VLAN IDs; valid values are from 1 to 4094.
<i>end-vlan</i>	End of a range of VLAN IDs; valid values are from 1 to 4094.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

### Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

You must identify the active Supervisor Engine by using the **showmodule** command; and start a command-line interface session with the active Supervisor Engine by using the **attach** command in privileged EXEC mode, before you can use the **showmlsdf-table** command.

In the output display, the following applies:

- 1 indicates that DF is enabled.
- 0 indicates that DF is disabled.

### Examples

This example shows how to display the DF-table contents on the Supervisor Engine for a range of VLANs. The fields shown in the display are self-explanatory.

```
Router# remote login switch
Trying Switch ...
Entering CONSOLE for Switch
Type "^C^C" to end this session
Router-sp#

Router-sp# show mls df-table 201 212
TYCHO FIB DF Table
vlan    df_index
      3 2 1 0
-----+-----
201    0 0 0 0
202    0 0 0 0
203    0 0 0 0
204    0 0 0 0
205    0 0 0 0
206    0 0 0 0
207    0 0 0 0
208    0 0 0 0
```

```
209 0 0 0 0
210 0 0 0 0
211 0 0 0 0
212 0 0 0 0
Router-sp#
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show mls ASIC</b>	Displays the ASIC version.
<b>show mls ip</b>	Displays the MLS IP information.
<b>show mls ipx</b>	Displays the MLS IPX information.
<b>show mls qos</b>	Displays MLS QoS information.
<b>show mls statistics</b>	Displays the MLS statistics for the IP.

## show mls masks

To display the details of the access control parameters (ACPs) that are used for multilayer switching (MLS) quality of service (QoS) and security access control lists (ACLs), use the **showmlsmasks** command in privileged EXEC mode.

```
show mls masks [{qos | security}]
```

### Syntax Description

<b>qos</b>	(Optional) Displays details of ACPs used for QoS ACLs.
<b>security</b>	(Optional) Displays details of ACPs used for security ACLs.



**Note** ACPs are called masks in the command-line interface (CLI) commands and output.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.1(6)EA2	This command was introduced.
12.2(15)ZJ	This command was implemented on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

### Usage Guidelines

Use the **showmlsmask** command without keywords to display all ACPs configured on the switch.

Use this command with the **qos** keyword to display the ACPs used for QoS ACLs.

Use this command with the **security** keyword to display the ACPs used for security ACLs.



**Note** You can configure up to four ACPs (QoS and security) on a switch.

### Examples

The following is sample output from the **showmlsmasks** command. In this example, Mask 1 is a QoS ACP consisting of an IP source address (with wildcard bits 0.0.0.255), an IP destination address, and Layer 4 destination port fields. This ACP is used by the QoS policy maps pmap1 and pmap2.

The fields shown in the display are self-explanatory.

```
Router# show mls masks
Mask1
  Type : qos
  Fields : ip-sa(0.0.0.255), ip-da(host), dest-port
  Policymap: pmap1
            Interfaces: Fa0/9, Gi0/1
  Policymap: pmap2
            Interfaces: Fa0/1, Fa0/5, Fa0/13
```

**Related Commands**

Command	Description
<b>ip access-group</b>	Applies an IP ACL to an interface.
<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.

# show mls rp

To display multilayer switching (MLS) details, including specifics for the Multilayer Switching Protocol (MLSP), use the **showmlsrp** command in user EXEC mode or privileged EXEC mode.

**show mls rp** [*interface*]

## Syntax Description

<i>interface</i>	(Optional) Displays information for one interface. Without this argument, detailed views of all interfaces are displayed.
------------------	---

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

Release	Modification
11.3(3)WA4(4)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

## Examples

The following is sample output from the **showmlsrp** command. The fields shown in the display are self-explanatory.

```
Router# show mls rp
multilayer switching is globally enabled
mls id is 00e0.fefc.6000
mls ip address 10.20.26.64
mls flow mask is ip-flow
vlan domain name: WBU
  current flow mask: ip-flow
  current sequence number: 80709115
  current/maximum retry count: 0/10
  current domain state: no-change
  current/next global purge: false/false
  current/next purge count: 0/0
  domain uptime: 13:03:19
  keepalive timer expires in 9 seconds
  retry timer not running
  change timer not running
  fcp subblock count = 7

1 management interface(s) currently defined:
  vlan 1 on Vlan1

7 mac-vlan(s) configured for multi-layer switching:

  mac 00e0.fefc.6000
  vlan id(s)
  1 10 91 92 93 95 100

router currently aware of following 1 switch(es):
  switch id 0010.1192.b5ff
```



The following is sample output from the **showmlsrp** command for a specific interface:

```
Router# show mls rp int vlan 10  
mls active on Vlan10, domain WBU
```

**Related Commands**

Command	Description
<b>mls rp ip</b>	Enables MLSP.
<b>mls rp management-interface</b>	Designates an interface as the management interface for MLSP packets.
<b>mls rp nde-address</b>	Specifies a NetFlow Data Export address.
<b>mls rp vlan-id</b>	Assigns a VLAN ID.
<b>mls rp vtp-domain</b>	Selects the router interface to be Layer 3 switched and then adds that interface to a VTP domain.
<b>show mls rp vtp-domain</b>	Displays MLS interfaces for a specific VTP domain.

# show mls rp interface

To display Internetwork Packet Exchange (IPX) multilayer switching (MLS) details for the route processor (RP), including specific information about the Multilayer Switching Protocol (MLSP), use the `show mls rp interface` command in user EXEC mode or privileged EXEC mode.

**show mls rp interface** *type number*

## Syntax Description

<i>type</i>	Interface type.
<i>number</i>	Interface number.

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

Release	Modification
12.0(5)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

## Examples

The following displays sample output from the `showmlsrpinterface` command. The interface type is VLAN, and its number is 10. The fields shown in the display are self-explanatory.

```
Router# show mls rp interface vlan 10
IPX MLS active on Vlan 10, domain WBU
```

## Related Commands

Command	Description
<code>mls rp ipx (global)</code>	Enables the router as an IPX MLS RP.
<code>mls rp locate ipx</code>	Displays information about all switches currently shortcutting for the specified IPX flows.
<code>mls rp vtp-domain</code>	Assigns an MLS interface to a specific VTP domain on the MLS RP.
<code>mls rp management-interface</code>	Designates an interface as the management interface for MLSP packets.
<code>mls rp vlan-id</code>	Assigns a VLAN identification number to an IPX MLS interface.
<code>show mls rp ipx</code>	Displays details for all IPX MLS interfaces on the IPX MLS router.
<code>show mls rp vtp-domain</code>	Displays IPX MLS interfaces for a specific VTP domain on the route processor.

## show mls rp ip multicast

To display hardware-switched multicast flow information about IP multicast multilayer switching (MLS), use the **showmlsrpipmapmulticast** command in user EXEC mode or privileged EXEC mode.

**show mls rp ip multicast** [*locate*] [*group* [*source*] [*vlan-id*]] [*statistics*] [*summary*]

Syntax Description	locate	(Optional) Displays flow information associated with the switch. This keyword applies only to a single router and multiple switches.
	<i>group</i>	(Optional) Address of the IP multicast group about which to display information.
	<i>source</i>	(Optional) IP multicast source sending to the specified multicast group about which to display information.
	<i>vlan-id</i>	(Optional) Source VLAN about which to display information.
	<b>statistics</b>	(Optional) Displays MLS statistics.
	<b>summary</b>	(Optional) Displays MLS summary.

**Command Modes** User EXEC Privileged EXEC

Command History	Release	Modification
	12.0(5)T	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

### Examples

The following is sample output of the **showmlsrpipmapmulticast** command using the **locate** keyword:

```
Router# show mls rp ip multicast locate
Source          Group           Vlan  SwitchIP      SwitchMAC
-----
192.168.10.6    239.255.158.197  10    192.168.10.199  0010.a60b.b4ff
```

The following is sample output of the **showmlsrpipmapmulticast** command for a specific IP multicast group:

```
Router# show mls rp ip multicast 224.1.1.1
Multicast hardware switched flows:
(10.1.13.1, 224.1.1.1) Incoming interface: Vlan13, Packets switched: 61590
Hardware switched outgoing interfaces: Vlan20 Vlan9
MFD installed: Vlan13
(10.1.9.3, 224.1.1.1) Incoming interface: Vlan9, Packets switched: 0
Hardware switched outgoing interfaces: Vlan20
MFD installed: Vlan9
(10.1.12.1, 224.1.1.1) Incoming interface: Vlan12, Packets switched: 62010
Hardware switched outgoing interfaces: Vlan20 Vlan9
```

```

MFD installed: Vlan12
(10.1.12.3, 224.1.1.1) Incoming interface: Vlan12, Packets switched: 61980
Hardware switched outgoing interfaces: Vlan20 Vlan9
MFD installed: Vlan12
(10.1.11.1, 224.1.1.1) Incoming interface: Vlan11, Packets switched: 62430
Hardware switched outgoing interfaces: Vlan20 Vlan9
MFD installed: Vlan11
(10.1.11.3, 224.1.1.1) Incoming interface: Vlan11, Packets switched: 62430
Hardware switched outgoing interfaces: Vlan20 Vlan9
MFD installed: Vlan11
Total shortcut installed: 6

```

The following is sample output of the **showmlsrpipmapmulticast** command using the **statistics** keyword:

```

Router# show mls rp ip multicast statistics
MLS Multicast Operation Status:
MLS Multicast configuration and state:
  Router Mac: 0010.298f.0009
  Switch Mac: 0010.0d70.a3ff      Switch IP: 10.2.10.195
  MLS Multicast Operating state: ACTIVE
  Active management vlan: Vlan1, 192.1.4.1
  User configured management vlan: None, 0.0.0.0
  Include-List: IP1 = 192.168.28.2, IP2 = 10.0.0.0
  Router IP used in MLS Multicast messages: 192.168.28.2
MLS Multicast statistics:
  Keepalive sent: 90
  Keepalive ACK received: 90
  Open request sent: 3
  Open request ACK received: 3
  Delete notifications received: 3
  Flow statistics messages received: 181
  Flow message sent: 14
  Flow message Ack received: 14
  Flow message Nack received: 0
  Flow install Ack: 2
  Flow install Nack: 0
  Flow update Ack: 7
  Flow update Nack: 0
  Flow delete Ack: 0
  Complete flow install Ack: 3
  Complete flow install Nack: 0
  Complete flow delete Ack: 1
  Input vlan delete Ack: 0
  Output vlan delete Ack: 0
  Global delete sent: 1
  L2 entry not found error: 0
  LTL entry not found error: 0
  MET entry not found error: 0
  L3 entry not found error: 0
  L3 entry exists error : 0
  Hash collision error : 0
  Sequence number error : 0
  None-supported error : 0
  Generic error : 0

```

The following is sample output of the **showmlsrpipmapmulticast** command using the **summary** keyword:

```

Router# show mls rp ip multicast summary
Switch IP:10.0.0.0  Switch MAC:0000.0000.0000
Number of complete flows: 0
Total hardware-switched flows: 0
Switch IP:10.2.10.199  Switch MAC:0010.a60b.b4ff

```

```
Number of complete flows: 1
Total hardware-switched flows: 1
```

**Related Commands**

Command	Description
<b>mls rp ip multicast</b>	Enables IP multicast MLS (hardware switching) on an external or internal router in conjunction with Layer 3 switching hardware for the Catalyst 5000 switch.

## show mls rp ipx

To display details for all Internetwork Packet Exchange (IPX) multilayer switching (MLS) interfaces on the IPX MLS router, use the **showmlsrp** command in privileged EXEC mode.

**show mls rp ipx**

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

**Command Modes** Privileged EXEC (#)

### Command History

Release	Modification
12.0(5)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

### Usage Guidelines

This command gives you details about the following:

- MLS status (enabled or disabled) for switch interfaces and subinterfaces
- Flow mask required when creating Layer 3 switching entries for the router
- Current settings for the keepalive timer, retry timer, and retry count
- MLS identifier used in Multilayer Switching Protocol (MLSP) messages
- List of all interfaces in all Virtual Trunking Protocol (VTP) domains enabled for MLS

### Examples

The following example shows sample output from the **showmlsrp** command for all IPX MLS interfaces on an MLS route processor (RP). The fields shown in the display are self-explanatory.

```
Router# show mls rp ipx
ipx multilayer switching is globally enabled
ipx mls inbound acl override is globally disabled
mls id is 0050.73ff.b580
mls ip address 5.5.5.155
IPX MLS flow mask is source-destination
number of domains configured for mls 1
vlan domain name:Engineering
  current ipx flow mask:source-destination
  ipx current/next global purge:false/false
  ipx current/next purge count:0/0
  current sequence number:4086390283
  current/maximum retry count:0/10
  current domain state:no-change
  domain uptime:03:13:09
  keepalive timer expires in 3 seconds
  retry timer not running
  change timer not running
  1 management interface(s) currently defined:
```

```

vlan 21 on Vlan21
2 mac-vlan(s) enabled for ipx multi-layer switching:
  mac 0010.0738.2917
    vlan id(s)
      22
  mac 0050.73ff.b5b8
    vlan id(s)
      21
router currently aware of following 1 switch(es):
  switch id 00e0.fe4a.aeff

```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>mls rp ipx (global)</b>	Enables the router as an IPX MLS RP.
<b>mls rp locate ipx</b>	Displays information about all switches currently shortcutting for the specified IPX flows.
<b>mls rp management-interface</b>	Designates an interface as the management interface for MLSP packets.
<b>mls rp vlan-id</b>	Assigns a VLAN identification number to an IPX MLS interface.
<b>show mls rp interface</b>	Displays IPX MLS details for the RP, including specific information about the MLSP.
<b>show mls rp vtp-domain</b>	Displays IPX MLS interfaces for a specific VTP domain on the RP.

## show mls rp vtp-domain

To display Internetwork Packet Exchange (IPX) multilayer switching (MLS) interfaces for a specific Virtual Trunking Protocol (VTP) domain on a Route Processor (RP), use the `show mls rp vtp-domain` command in privileged EXEC mode.

**show mls rp vtp-domain** *domain-name*

### Syntax Description

<i>domain-name</i>	The name of the VTP domain whose MLS interfaces will be displayed.
--------------------	--

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
11.3(3)WA4(4)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

### Examples

This example shows details about IPX MLS interfaces in a VTP domain named WBU. The fields shown in the display are self-explanatory.

```
Router# show mls rp vtp-domain WBU
vlan domain name: WBU
current ipx flow mask: destination
  ipx current/next global purge: false/false
  ipx current/next purge count: 0/0
current ipx flow mask: destination
  ipx current/next global purge: false/false
  ipx current/next purge count: 0/0
current sequence number: 590678296
current/maximum retry count: 0/10
current domain state: no-change
domain uptime: 1d14h
keepalive timer expires in 3 seconds
retry timer not running
change timer not running
fcp subblock count = 20
1 management interface(s) currently defined:
  vlan 2 on Vlan2
20 mac-vlan(s) configured for multi-layer switching
17 mac-vlan(s) enabled for ipx multi-layer switching:
  mac 0010.0738.2917
    vlan id(s)
      2   3   4   5   6   7   8   9   10  12  13
      14  15  88  99
  mac 0090.6dfc.5800
    vlan id(s)
      20  21
18 mac-vlan(s) enabled for ipx multi-layer switching:
  mac 0010.0738.2917
    vlan id(s)
```



```

      2   3   4   5   6   7   8   9   10  11  12
      13  14  15  66  77  88  99
router currently aware of following 1 switch(es):
  switch id 0010.141f.6fff

```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>mls rp ipx (global)</b>	Enables the router as an IPX MLS RP.
<b>mls rp locate ipx</b>	Displays information about all switches currently shortcutting for the specified IPX flows.
<b>mls rp management-interface</b>	Designates an interface as the management interface for MLSP packets.
<b>mls rp vlan-id</b>	Assigns a VLAN identification number to an IPX MLS interface.
<b>show mls rp interface</b>	Displays IPX MLS details for the RP, including specific information about the MLSP.
<b>show mls rp ipx</b>	Displays details for all IPX MLS interfaces on the IPX MLS router.
<b>show mls rp vtp-domain</b>	Displays IPX MLS interfaces for a specific VTP domain on the RP.

## show mmls igmp explicit-tracking

To display information about the host-tracking database, use the **showmmlsigmpexplicit-tracking** command in privileged EXEC mode.

**show mmls igmp explicit-tracking** [*vlan-id*]

### Syntax Description

<i>vlan-id</i>	(Optional) VLAN ID; valid values are 1 to 4094.
----------------	---

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

### Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

### Examples

This example shows how to display information about the host-tracking database for a specific VLAN. The fields shown in the display are self-explanatory.

```
Switch-sp# show mmls igmp explicit-tracking 27
Source/Group          Interface    Reporter    Filter_mode
-----
10.1.1.1/224.1.1.1    V127:3/25  10.27.2.3   INCLUDE
10.2.2.2/224.1.1.1    V127:3/25  10.27.2.3   INCLUDE
Router#
```

## show mmls msc

To display information about Multicast Multilayer Switching (MMLS), use the **show mmls msc** command in privileged EXEC mode.

```
show mmls msc [{cache | entry | icroif-cache | rpdf-cache | statistics | vpn}]
```

Syntax Description	cache	(Optional) Displays information about the multicast shortcuts for the process cache.
	entry	(Optional) Displays information about the dump-hardware entries in Layer 3.
	icroif-cache	(Optional) Displays information about the dump Initial Cell Rate Out of IMA Frame (ICROIF) cache.
	rpdf-cache	(Optional) Displays information about the dump bidirectional (Bidir) Route Processor (RP) designated forwarder (DF) cache.
	statistics	(Optional) Displays statistics about the multicast shortcuts process.
	vpn	(Optional) Displays information about VPNs.

**Command Default** MMLS information is not displayed.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

**Usage Guidelines** The **show mmls msc** command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

### Examples

The following example shows how to display information about MMLS. The fields are self-explanatory.

```
Router# remote login switch

Trying Switch ...
Entering CONSOLE for Switch
Type "^C^C^C" to end this session

Router#
Router# show mmls msc

      General Info
      -----+-----
Number shortcuts in software database      1890
Number of MFD in software database        1890
Router MAC                                0001.64f8.1b00
Internal Vlan                              4093
```

```

Aggregation Vlan                                0
Aggregation Indexes                             0
Current Size of inputQ                           0
Maximum Size of inputQ                           2
flow statistics timeout [sec]                    25
non-rpf MFDs purge timeout [sec]                 20
non-rpf MFDs aging timeout [sec]                2.0

```

The following example shows how to display information about the MMLS shortcut-process cache:

```
Router# show mmls msc cache
```

```

-----macg cache buckets for vpn 0-----
Bucket 90 #g: 1
Group mac address: 0100.5e01.0105
$$$ (S,G,C): (10.0.0.4, 224.1.1.5, 100)      mfd_flag: 1 type: Sparse
$$$ (S,G,C): (0.0.0.0, 224.1.1.5, 1)        mfd_flag: 1 type: Sparse
### vlan: 100  sc_count: 0 rpf_count: 1
### vlan: 1    sc_count: 0 rpf_count: 1
Bucket 91 #g: 1
Group mac address: 0100.5e01.0104
$$$ (S,G,C): (10.0.0.4, 224.1.1.4, 100)      mfd_flag: 1 type: Sparse
$$$ (S,G,C): (0.0.0.0, 224.1.1.4, 1)        mfd_flag: 1 type: Sparse
### vlan: 100  sc_count: 0 rpf_count: 1
### vlan: 1    sc_count: 0 rpf_count: 1
Bucket 92 #g: 1
Group mac address: 0100.5e01.0103
$$$ (S,G,C): (10.0.0.4, 224.1.1.3, 100)      mfd_flag: 1 type: Sparse
$$$ (S,G,C): (0.0.0.0, 224.1.1.3, 1)        mfd_flag: 1 type: Sparse
### vlan: 100  sc_count: 0 rpf_count: 1
### vlan: 1    sc_count: 0 rpf_count: 1
Bucket 93 #g: 1
Group mac address: 0100.5e01.0102
$$$ (S,G,C): (10.0.0.4, 224.1.1.2, 100)      mfd_flag: 1 type: Sparse
$$$ (S,G,C): (0.0.0.0, 224.1.1.2, 1)        mfd_flag: 1 type: Sparse
### vlan: 100  sc_count: 0 rpf_count: 1
### vlan: 1    sc_count: 0 rpf_count: 1
Bucket 94 #g: 1
Group mac address: 0100.5e01.0101
$$$ (S,G,C): (10.0.0.4, 224.1.1.1, 100)      mfd_flag: 1 type: Sparse
$$$ (S,G,C): (0.0.0.0, 224.1.1.1, 1)        mfd_flag: 1 type: Sparse
### vlan: 100  sc_count: 0 rpf_count: 1
### vlan: 1    sc_count: 0 rpf_count: 1

```

The following example shows how to display dump ICROIF-cache information:

```
Router# show mmls msc icroif-cache
```

```

msc_local_icroif_index: 0x493
msc_global_icroif_index: 0x494
ICROIF CACHE:
-----
Module mask: 0x8      Icroif_index: 0x495

```

The following example shows how to display a dump list of DF interfaces for the PIM-RPs:

```
Router# show mmls msc rpdf-cache
```

```

----- RP-CACHE [VPN-0] -----
Bucket# :0

```

```

RP-addr: 10.1.0.1, Rpf: 0 Vpn: 0
DF-index: 0
DF-list: 201 202 203 204 205 206 207 208 209 210
         211 212
Group-list:
         (224.1.0.0/24, H)
G/m-count: 1, G/32-count: 1
Bucket# :2
RP-addr: 10.3.0.1, Rpf: 0 Vpn: 0
DF-index: 2
DF-list: 201 202 203 204 205 206 207 208 209 210
         211 212
Group-list:
         (224.1.2.0/24, H)
G/m-count: 1, G/32-count: 0
Bucket# :3
RP-addr: 10.2.0.1, Rpf: 0 Vpn: 0
DF-index: 1
DF-list: 201 202 203 204 205 206 207 208 209 210
         211 212
Group-list:
         (224.1.1.0/24, H)
G/m-count: 1, G/32-count: 1
Bucket# :5
RP-addr: 10.4.0.1, Rpf: 0 Vpn: 0
DF-index: 3
DF-list: 201 202 203 204 205 206 207 208 209 210
         211 212
Group-list:
         (224.1.3.0/24, H)
G/m-count: 1, G/32-count: 0

```

The following example shows how to display the statistics for the multicast-shortcut process:

```
Router# show mmls msc statistics
```

```

Communication Statistics
-----+-----+
Number MSM PDU Received          1
Number MSM PDU Sent              1
Unsolicited Feature Notification Sent 1
Feature Notification Received     2
Feature Notification Sent         2
Stop retry Sent                  0
Stop download Sent               0
Error Statistics
-----+-----+
L2 entry not found               0
LTL full error                   0
MET full error                   0
Debug Statistics
-----+-----+
HW Met failure                   0
HW Dist failure                  0
HW L3 Install failure            0
HW L3 Update failure            0
TLV Statistics
-----+-----+
INSTALL TLV Received             0
SELECTIVE DELETE TLV Received   0
GROUP DELETE TLV Received       0
UPDATE TLV Received              0
INPUT VLAN DELETE TLV Received  0

```

OUTPUT VLAN DELETE TLV Received	0
GLOBAL DELETE TLV Received	0
MFD INSTALL TLV Received	0
MFD DELETE TLV Received	0
MFD GLOBAL DELETE Received	0
NRPF MFD INSTALL TLV Received	0
NRPF MFD DELETE TLV Received	0
SUBNET INSTALL TLV Received	15
SUBNET DELETE TLV Received	0
MVPN INSTALL TLV Received	0
MVPN SELECTIVE DELETE TLV Received	0
MVPN UPDATE TLV Received	0
MVPN GROUP DELETE TLV Received	0
MVPN MFD INSTALL TLV Received	0
MVPN MFD DELETE TLV Received	0
MVPN BIDIR RPDF UPDATE TLV Received	0
MVPN BIDIR RP UPDATE TLV Received	0
MVPN BIDIR CLEAR ALL GRP TLV Received	0
MVPN BIDIR CLEAR RP GRP TLV Received	0
MVPN BIDIR CLEAR ALL DF TLV Received	0
MVPN BIDIR CLEAR RP DF TLV Received	0
MVPN BIDIR CLEAR ALL RP TLV Received	0
MVPN BIDIR NONDF INSTALL TLV Received	0
INSTALL TLV Ack Sent	0
SELECTIVE DELETE TLV Ack Sent	0
GROUP DELETE TLV Ack Sent	0
UPDATE TLV Ack Sent	0
INPUT VLAN DELETE TLV Ack Sent	0
OUTPUT VLAN DELETE TLV Ack Sent	0
GLOBAL DELETE TLV Ack Sent	0
MFD INSTALL TLV Ack Sent	0
MFD DELETE TLV Ack Sent	0
MFD GLOBAL DELETE Ack Sent	0
NRPF MFD INSTALL TLV Ack Sent	0
NRPF MFD DELETE TLV Ack Sent	0
SUBNET INSTALL TLV Ack Sent	15
SUBNET DELETE TLV Ack Sent	0
MVPN INSTALL TLV Ack Sent	0
MVPN SELECTIVE DELETE TLV Ack Sent	0
MVPN UPDATE TLV Ack Sent	0
MVPN GROUP DELETE TLV Ack Sent	0
MVPN MFD INSTALL TLV Ack Sent	0
MVPN MFD DELETE TLV Ack Sent	0
MVPN BIDIR RPDF UPDATE TLV Ack Sent	0
MVPN BIDIR RP UPDATE TLV Ack Sent	0
MVPN BIDIR CLEAR ALL GRP TLV Ack Sent	1
MVPN BIDIR CLEAR RP GRP TLV Ack Sent	0
MVPN BIDIR CLEAR ALL DF TLV Ack Sent	0
MVPN BIDIR CLEAR RP DF TLV Ack Sent	0
MVPN BIDIR CLEAR ALL RP TLV Ack Sent	0
MVPN BIDIR NONDF INSTALL TLV Ack Sent	0
TLV Error Statistics	
-----+-----+	
Generic error	0
L3 entry exist error	0
Hash collision error	0
L3 entry not found	0
MFD exist error	0
MFD not found error	0
Invalid subnet error	0
Bidir-RP not found error	0
Bidir-DF partial fail error	0
Bidir-DF Table full error	0
TLV Debug Statistics	

```

-----+-----+
Non RPF L3 failure                                0
Bidir DF install                                  0
Bidir DF failure                                  0
Bidir NDF install                                 0
Bidir NDF failure                                 0
Bidir DF err-tlv sent                             0
Bidir GRP err-tlv sent                           0

```

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

**Table 19: show mmls msc Field Descriptions**

Field	Description
Number shortcuts in software database	Displays the number of shortcut process caches.
Number of MFD in software database	Displays the number of Multicast Fast Drop (MFD) that are present in the database.
Router MAC	MAC address of the router.
Internal Vlan	Internal VLAN.
Aggregation Vlan	The aggregation VLAN.
Current Size of inputQ	Current size of the input queue.
Maximum Size of inputQ	Maximum size of the input queue.
Maximum size of the input queue.	Timeout (seconds) specified for the flow statistics.
non-rpf MFDs purge timeout	Timeout (seconds) to purge non-Reverse Path Forwarding (RPF).
non-rpf MFDs aging timeout	Timeout (seconds) for aging non-Reverse Path Forwarding (RPF).
RP-addr	Rendezvous point address.
Rpf	Reverse Path Forwarding.
Vpn	VPNs.
DF-index	Do not fragment index.
G/m-count	Group/mask count.
Communication Statistics	MMLS communication statistics.
TLV Statistics	MMLS type, length, value statistics.

#### Related Commands

Command	Description
<b>show mls ASIC</b>	Displays the ASIC version.
<b>show mls df-table</b>	Displays information about the DF table.

<b>Command</b>	<b>Description</b>
<b>show mls ip</b>	Displays MLS IP information.
<b>show mls ipx</b>	Displays MLS IPX information.
<b>show mls qos</b>	Displays MLS QoS information.
<b>show mls statistics</b>	Displays the MLS statistics for the IP.



# show mvr

To display the Multicast VLAN Registration (MVR) details configured on the router, use the **show mvr** command in Privileged EXEC mode.

**show mvr**

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

**Command Default** None

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	15.1(3)S	This command was introduced on the Cisco 7600 routers.
	15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

## Examples

This example displays the **show mvr** output:

```
Router# show mvr
```

```
MVR Running: TRUE
MVR multicast vlan: 22
MVR Max Multicast Groups: 1000
MVR Current multicast groups: 256
MVR Global query response time: 10 (tenths of sec)
```

## Related Commands

Command	Description
<b>mvr</b>	Enables Multicast VLAN Registration (MVR) on the router.
<b>mvr group</b>	Configures a MVR group on the router.
<b>mvr max-groups</b>	Configures the MVR maximum number of groups on the router.
<b>mvr querytime</b>	Configures the MVR query response time.
<b>mvr vlan</b>	Configures the VLAN in which multicast data is received.
<b>mvr type</b>	Configures a switch port as an MVR receiver or source port.
<b>mvr immediate</b>	Enables the immediate leave feature of MVR on the port.
<b>show mvr groups</b>	Displays the MVR group configuration.
<b>show mvr interface</b>	Displays the details of all MVR member interfaces or a single requested MVR member interface.

Command	Description
<b>show mvr members</b>	Displays the details of all MVR members and number of MVR members in all active MVR groups on a particular VLAN or port.
<b>show mvr receiver-ports</b>	Displays all receiver ports that are members of an IP multicast group or those on the specified interface port.
<b>show mvr source-ports</b>	Displays all source ports that are members of an IP multicast group or those on the specified interface port.
<b>clear mvr counters</b>	Clears the join counters of all the MVR ports, source ports, receiver ports, or of a specified MVR interface port.

## show mvr groups

To display the Multicast VLAN Registration (MVR) group configuration, use the **show mvr groups** command in Privileged EXEC mode.

**show mvr groups**

**Command Default** None

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	15.1(3)S	This command was introduced on the Cisco 7600 routers.
	15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

### Examples

This example displays the **show mvr groups** command output:

```
Router# show mvr groups

MMVR max Multicast Groups allowed: 8000
MVR current multicast groups: 8000
MVR groups:
  Group start      Group end      Type  Count/Mask
  -----
  225.0.7.226     225.0.7.226   count 1
  225.0.7.227     225.0.7.227   count 1
  225.0.7.228     225.0.7.228   count 1
  225.0.7.229     225.0.7.229   count 1
  225.0.7.230     225.0.7.230   count 1
  225.0.7.231     225.0.7.231   count 1
  236.8.7.0       236.8.7.255   mask  255.255.255.0
  237.8.7.0       237.8.7.255   mask  255.255.255.0
  237.8.8.0       237.8.8.255   mask  255.255.255.0
```

Related Commands	Command	Description
	<b>mvr</b>	Enables Multicast VLAN Registration (MVR) on the router.
	<b>mvr group</b>	Configures an MVR group on the router.
	<b>mvr max-groups</b>	Configures the maximum number of MVR groups on the router.
	<b>mvr querytime</b>	Configures the MVR query response time.
	<b>mvr vlan</b>	Configures the VLAN in which multicast data is received.
	<b>mvr type</b>	Configures a switch port as an MVR receiver or source port.
	<b>mvr immediate</b>	Enables the immediate leave feature of MVR on the port.

<b>Command</b>	<b>Description</b>
<b>show mvr</b>	Displays the MVR details.
<b>show mvr interface</b>	Displays the details of all MVR member interfaces, or a single requested MVR member interface.
<b>show mvr members</b>	Displays the details of all MVR members and number of MVR members in all active MVR groups on a particular VLAN or port.
<b>show mvr receiver-ports</b>	Displays all receiver ports that are members of an IP multicast group or those on the specified interface port.
<b>show mvr source-ports</b>	Displays all source ports that are members of an IP multicast group or those on the specified interface port.
<b>clear mvr counters</b>	Clears the join counters of all the MVR ports, source ports, receiver ports, or of a specified MVR interface port.

## show mvr interface

To display the details of all the Multicast VLAN Registration (MVR) member interfaces or a single MVR member interface, use the **show mvr interface** command in Privileged EXEC mode.

```
show mvr interface [type module/port ]
```

### Syntax Description

<i>type</i>	(Optional) Specifies the interface type.
<i>module/port</i>	(Optional) Specifies the module or port number.

### Command Default

None

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
15.1(3)S	This command was introduced on the Cisco 7600 routers.
15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

### Examples

This example displays the **show mvr interface** output:

```
Router# show mvr interface gigabitEthernet 1/20
```

```
Port      VLAN  Type      Status      Immediate Leave
----      -
Gi1/20    2    RECEIVER  ACTIVE/UP   DISABLED
```

### Related Commands

Command	Description
<b>mvr</b>	Enables MVR on the router.
<b>mvr group</b>	Configures an MVR group on the router.
<b>mvr max-groups</b>	Configures the maximum number of MVR groups on the router.
<b>mvr querytime</b>	Configures the MVR query response time.
<b>mvr vlan</b>	Configures the VLAN in which multicast data is received.
<b>mvr type</b>	Configures a switch port as an MVR receiver or source port.
<b>mvr immediate</b>	Enables the immediate leave feature of MVR on the port.
<b>show mvr</b>	Displays the MVR details.
<b>show mvr groups</b>	Displays the MVR group configuration.

Command	Description
<b>show mvr interface</b>	Displays the details of all MVR member interfaces, or a single requested MVR member interface.
<b>show mvr members</b>	Displays the details of all MVR members and number of MVR members in all active MVR groups on a particular VLAN or port.
<b>show mvr receiver-ports</b>	Displays all receiver ports that are members of an IP multicast group or those on the specified interface port.
<b>show mvr source-ports</b>	Displays all source ports that are members of an IP multicast group or those on the specified interface port.
<b>clear mvr counters</b>	Clears the join counters of all the MVR ports, source ports, receiver ports, or of a specified MVR interface port.

## show mvr members

To display details of all the Multicast VLAN Registration (MVR) members and number of MVR members in all active MVR groups on a particular VLAN or port, use the **show mvr members** command in Privileged EXEC mode.

```
show mvr members
vlan vlan-id
type module/port
count
```

Syntax Description		
	<i>vlan-id</i>	Specifies the MVR multicast VLAN ID.
	<i>type</i>	(Optional) Specifies the interface type.
	<i>module/port</i>	(Optional) Specifies the module or port number.

**Command Default** None

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	15.1(3)S	This command was introduced on the Cisco 7600 routers.

### Examples

This example displays the **show mvr members** command output:

```
Router# show mvr members vlan 2

MVR Group IP      Status      Members
-----
224.000.001.001   ACTIVE     Gi1/20 (u) ,Gi1/21 (u)
224.000.001.002   ACTIVE     Fa3/2 (d) ,Gi1/12 (u)

Router# show mvr members vlan 490 count

Count of active MVR groups on vlan 490 = 400
```

Related Commands	Command	Description
	<b>mvr</b>	Enables MVR on the router.
	<b>mvr group</b>	Configures an MVR group on the router.
	<b>mvr max-groups</b>	Configures the MVR maximum number of groups on the router.
	<b>mvr querytime</b>	Configures the MVR query response time.
	<b>mvr vlan</b>	Configures the VLAN in which multicast data is received.

Command	Description
<b>mvr type</b>	Configures a switch port as an MVR receiver or source port.
<b>mvr immediate</b>	Enables the immediate leave feature of MVR on the port.
<b>show mvr</b>	Displays the MVR details.
<b>show mvr groups</b>	Displays the MVR group configuration.
<b>show mvr interface</b>	Displays the details of all MVR member interfaces, or a single requested MVR member interface.
<b>show mvr receiver-ports</b>	Displays all receiver ports that are members of an IP multicast group or those on the specified interface port.
<b>show mvr source-ports</b>	Displays all source ports that are members of an IP multicast group or those on the specified interface port.
<b>clear mvr counters</b>	Clears the join counters of all the MVR ports, source ports, receiver ports, or of a specified MVR interface port.



## show mvr receiver-ports

To display all receiver ports that are members of any IP multicast group or those on the specified interface port, use the **show mvr receiver-ports** command in Privileged EXEC mode.

```
show mvr receiver-ports
[type module/port]
```

Syntax Description	type	(Optional) Specifies the interface type.
	module/port	(Optional) Specifies the module or port number.

**Command Default** None

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	15.1(3)S	This command was introduced on the Cisco 7600 routers.
	15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

### Examples

This example displays the **show mvr receiver-ports** output:

```
Router# show mvr receiver-ports GigabitEthernet 1/7

Joins: v1,v2,v3 counter shows total IGMP joins
       v3 counter shows IGMP joins received with both MVR and non-MVR groups
Port   VLAN Status          Immediate      Joins
      (v1,v2,v3)
-----
Gi1/7  202 INACTIVE/UP    ENABLED        305336        0
```

Related Commands	Command	Description
	<b>mvr</b>	Enables MVR on the router.
	<b>mvr group</b>	Configures an MVR group on the router.
	<b>mvr max-groups</b>	Configures the maximum number of MVR groups on the router.
	<b>mvr querytime</b>	Configures the MVR query response time.
	<b>mvr vlan</b>	Configures the VLAN in which multicast data is received.
	<b>mvr type</b>	Configures a switch port as an MVR receiver or source port.
	<b>mvr immediate</b>	Enables the immediate leave feature of MVR on the port.

<b>Command</b>	<b>Description</b>
<b>show mvr</b>	Displays the MVR details.
<b>show mvr groups</b>	Displays the MVR group configuration.
<b>show mvr interface</b>	Displays the details of all MVR member interfaces, or a single requested MVR member interface.
<b>show mvr members</b>	Displays details of all the MVR members and number of MVR members in all active MVR groups on a particular VLAN or port.
<b>show mvr source-ports</b>	Displays all source ports that are members of an IP multicast group or those on the specified interface port.
<b>clear mvr counters</b>	Clears the join counters of all the MVR ports, source ports, receiver ports, or of a specified MVR interface port.

## show mvr source-ports

To display all source ports that are members of any IP multicast group or those on the specified interface port, use the **show mvr source-ports** command in Privileged EXEC mode.

**show mvr source-ports**

Syntax Description	type	(Optional) Specifies the Interface type.
	module/port	(Optional) Specifies the module or port number.

**Command Default** None

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	15.1(3)S	This command was introduced on the Cisco 7600 routers.
	15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

### Examples

This example displays the **show mvr source-ports** output:

```
Router# show mvr source-ports GigabitEthernet 1/7

Joins: v1,v2,v3 counter shows total IGMP joins
       v3 counter shows IGMP joins received with both MVR and non-MVR groups
Port   VLAN Status           Immediate           Joins
      (v1,v2,v3)
-----
Gi1/7  202 INACTIVE/UP    DISABLED           305336  0
```

Related Commands	Command	Description
	<b>mvr</b>	Enables Multicast VLAN Registration (MVR) on the router.
	<b>mvr group</b>	Configures an MVR group on the router.
	<b>mvr max-groups</b>	Configures the MVR maximum number of groups on the router.
	<b>mvr querytime</b>	Configures the MVR query response time.
	<b>mvr vlan</b>	Configures the VLAN in which multicast data is received.
	<b>mvr type</b>	Configures a switch port as an MVR receiver or source port.
	<b>mvr immediate</b>	Enables the immediate leave feature of MVR on the port.
	<b>show mvr</b>	Displays the MVR details.

Command	Description
<b>show mvr groups</b>	Displays the MVR group configuration.
<b>show mvr interface</b>	Displays the details of all MVR member interfaces, or a single requested MVR member interface.
<b>show mvr members</b>	Displays details of all the MVR members and number of MVR members in all active MVR groups on a particular VLAN or port.
<b>show mvr receiver-ports</b>	Displays all receiver ports that are members of an IP multicast group or those on the specified interface port.
<b>clear mvr counters</b>	Clears the join counters of all the MVR ports, source ports, receiver ports, or of a specified MVR interface port.

# show mvrp interface

To display Multiple VLAN Registration Protocol (MVRP) interface states, use the **show mvrp interface** command in privileged EXEC mode.

```
show mvrp interface [ {type slot / port} ] [ {statistics} ]
```

Syntax Description	
<i>type slot / port</i>	(Optional) The interface for which information is displayed.
<b>statistics</b>	(Optional) Displays MVRP statistics information for the MVRP port.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(33)SXI	This command was introduced.

**Usage Guidelines** Use this command to display MVRP interface details of the administrative and operational MVRP states of all or one particular IEEE 802.1q trunk port in the device.

## Examples

The following example shows sample output. The fields are self-explanatory.

```
Router# show mvrp interface

Port      Status      Registrar State
Fa3/1     off         normal
Port      Join Timeout  Leave Timeout  Leaveall Timeout
Fa3/1     201 600      700            1000
Port      Vlans Declared
Fa3/1     none
Port      Vlans Registered
Fa3/1     none
Port      Vlans Registered and in Spanning Tree Forwarding State
Fa3/1     none
```

Related Commands	Command	Description
	<b>show mvrp summary</b>	Displays the MVRP configuration at the device level.

## show mvrp module

To display Multiple VLAN Registration Protocol (MVRP)-related information for a specific module, use the **show mvrp module** command in privileged EXEC mode.

**show mvrp module** *module-number*

### Syntax Description

<i>module-number</i>	Indicates the module for which information is displayed.
----------------------	--

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(33)SXI	This command was introduced.

### Usage Guidelines

Use this command to display MVRP module details of the administrative and operational MVRP states of all or one particular IEEE 802.1q trunk port in the device.

### Examples

The following example shows sample summary output. The fields are self-explanatory.

```
Router# show mvrp module 3
Port      Status      Registrar State
Fa3/1     off         normal
Port      Join Timeout  Leave Timeout  Leaveall Timeout
Fa3/1     201         700           1000
Fa3/5     201         700           1000
Port      Vlans Declared
Fa3/1     none
Fa3/5     3,100
Port      Vlans Registered
Fa3/1     none
Fa3/5     3,100
Port      Vlans Registered and in Spanning Tree Forwarding State
Fa3/1     none
Fa3/5     3
```

### Related Commands

Command	Description
<b>show mvrp summary</b>	Displays the MVRP configuration at the device level.

# show mvrp summary

To display the Multiple VLAN Registration Protocol (MVRP) configuration at the device level, use the **show mvrp summary** command in privileged EXEC mode.

**show mvrp summary**

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

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(33)SXI	This command was introduced.

**Usage Guidelines** Use this command to display MVRP configuration details.

## Examples

The following example shows sample summary output for a device with MVRP configured. The fields are self-explanatory.

```
Router# show
  mvrp
  summary
MVRP global state           : enabled
MVRP VLAN creation          : disabled
VLANs created via MVRP      : 20-45, 3001-3050
Learning disabled on VLANs  : none
```

Related Commands	Command	Description
	<b>show mvrp interface</b>	Displays details of the administrative and operational MVRP states of all or one particular IEEE 802.1q trunk port in the device.

# show platform software status control-processor

To display status information about the control processors, use the **showplatformsoftwarestatuscontrol-processor** command in privileged EXEC or diagnostic mode.

**show platform software status control-processor [brief]**

## Syntax Description

<b>brief</b>	(Optional) Displays summary status information for the control processors.
--------------	--

## Command Modes

Privileged EXEC (#) Diagnostic (diag)

## Command History

Release	Modification
Cisco IOS XE Release 2.1	This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers.
Cisco IOS XE Release 2.2	This command was modified. The <b>brief</b> keyword was added.

## Usage Guidelines

Control processors consist of Embedded Services Processors (ESPs), Route Processors (RPs), and SPA Interface Processors (SIPs).

Use the **showplatformsoftwarestatuscontrol-processor** command to provide a quick view of the health of the system concerning memory and CPU usage on each processor.

The CPU usage output reflects the relative percentage of CPU usage during the latest two seconds instead of the cumulative percent usage over the entire uptime.

All control processors should show a status of Healthy. Other possible status values are Warning and Critical. Warning indicates that the router is operational but that the operating level should be reviewed. Critical implies that the router is near failure.

If you see a status of Warning or Critical, take the following actions:

- Reduce static and dynamic loads on the system by reducing the number of elements in the configuration or by limiting the capacity for dynamic services.
- Reduce the number of routes and adjacencies, limit the number of ACLs and other rules, reduce the number of VLANs, and so on.

## Examples

The following example displays status information about the control processors:

```
Router# show platform software status control-processor
RP0: online, statistics updated 7 seconds ago
Load Average: healthy
  1-Min: 0.16, status: healthy, under 5.00
  5-Min: 0.16, status: healthy, under 5.00
 15-Min: 0.12, status: healthy, under 5.00
Memory (kb): healthy
  Total: 3733016
  Used: 1320804 (31%)
  Free: 2412212 (58%)
  Committed: 1889524 (45%), status: healthy, under 90%
```



```

ESP0: online, statistics updated 7 seconds ago
Load Average: healthy
  1-Min: 0.00, status: healthy, under 5.00
  5-Min: 0.00, status: healthy, under 5.00
 15-Min: 0.00, status: healthy, under 5.00
Memory (kb): healthy
  Total: 984996
  Used: 532492 (50%)
  Free: 452504 (43%)
  Committed: 1724096 (164%), status: healthy, under 300%
SIP0: online, statistics updated 10 seconds ago
Load Average: healthy
  1-Min: 0.00, status: healthy, under 5.00
  5-Min: 0.00, status: healthy, under 5.00
 15-Min: 0.00, status: healthy, under 5.00
Memory (kb): warning
  Total: 479884
  Used: 434476 (82%)
  Free: 45408 (8%)
  Committed: 202508 (38%), status: healthy, under 90%
SIP1: online, statistics updated 10 seconds ago
Load Average: healthy
  1-Min: 0.00, status: healthy, under 5.00
  5-Min: 0.00, status: healthy, under 5.00
 15-Min: 0.00, status: healthy, under 5.00
Memory (kb): warning
  Total: 479884
  Used: 430384 (82%)
  Free: 49500 (9%)
  Committed: 202512 (38%), status: healthy, under 90%

```

The following example displays summary status information about the control processors with **brief** keyword:

```

Router# show platform software status control-processor brief
Load Average
Slot Status 1-Min 5-Min 15-Min
RP0 Healthy 0.25 0.30 0.44
RP1 Healthy 0.31 0.19 0.12
ESP0 Healthy 0.01 0.05 0.02
ESP1 Healthy 0.03 0.05 0.01
SIP1 Healthy 0.15 0.07 0.01
SIP2 Healthy 0.03 0.03 0.00
Memory (kB)
Slot Status Total Used (Pct) Free (Pct) Committed (Pct)
RP0 Healthy 3722408 2514836 (60%) 1207572 (29%) 1891176 (45%)
RP1 Healthy 3722408 2547488 (61%) 1174920 (28%) 1889976 (45%)
ESP0 Healthy 2025468 1432088 (68%) 593380 (28%) 3136912 (149%)
ESP1 Healthy 2025468 1377980 (65%) 647488 (30%) 3084412 (147%)
SIP1 Healthy 480388 293084 (55%) 187304 (35%) 148532 (28%)
SIP2 Healthy 480388 273992 (52%) 206396 (39%) 93188 (17%)
CPU Utilization
Slot CPU User System Nice Idle IRQ SIRQ IOWait
RP0 0 30.12 1.69 0.00 67.63 0.13 0.41 0.00
RP1 0 21.98 1.13 0.00 76.54 0.04 0.12 0.16
ESP0 0 13.37 4.77 0.00 81.58 0.07 0.19 0.00
ESP1 0 5.76 3.56 0.00 90.58 0.03 0.05 0.00
SIP1 0 3.79 0.13 0.00 96.04 0.00 0.02 0.00
SIP2 0 3.50 0.12 0.00 96.34 0.00 0.02 0.00

```

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

Table 20: show platform software status control-processor Field Descriptions

Field	Description
<i>processor-name</i> : online	Name of the online control processor to which the statistics that follow apply.
statistics updated x seconds ago	Time (in seconds) when the statistics were last updated.
Load Average:	Summary status indicator of the overall control processor load average. This value is derived from the “5-Min” load average.
1-Min: / status:	One-minute load average on the control processor and status indicator.
5-Min: / status:	Five-minute load average on the control processor and status indicator.
15-Min: / status:	Fifteen-minute load average on the control processor and status indicator.
Memory (kb):	Summary status indicator of the overall control processor memory usage. This value signals if any of the individual memory values below are in critical or warning status.
Total:	Total memory (in kilobytes) on the control processor.
Used: xxxxxxx (pp%)	Total used memory (in kilobytes) on the control processor and the percentage of used memory on the control processor.
Free: xxxxxxx (pp%)	Total free memory (in kilobytes) on the control processor and the percentage of free memory on the control processor.
Committed: xxxxxxx (pp%) / status:	Total committed memory (in kilobytes) on the control processor, percentage of committed memory on the control processor, and status indicator.
CPU Utilization:	Percentage of time that the CPU is busy.
CPU:	Allocated processor.
User:	Non-Linux kernel processes.
System:	Linux kernel process.
Nice:	Low priority processes.
Idle:	Percentage of time that the CPU was inactive.
IRQ:	Interrupts.
SIRQ:	System interrupts.
IOwait:	Percentage of time that the CPU was waiting for I/O.

**Related Commands**

Command	Description
show platform software process list	Displays a list of the processes running in a given slot.

# show port flowcontrol

To display per-port status information and statistics related to flow control, use the **showportflowcontrol** command in privileged EXEC mode.

```
show port flowcontrol {[module-number] | [/{port-number}]}
```

## Syntax Description

<i>module-number</i>	(Optional) Number of the module.
<i>/port-number</i>	(Optional) Number of the port on the module. If you do not specify a number, filters configured on all the ports on the module are shown.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.2(11)T	This command was introduced and implemented on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.

## Usage Guidelines

The Catalyst 2948G is a fixed configuration switch. All ports are located on module 2; for this reason, if you enter *module-number/port-number 1/N*, an error message is displayed.

## Examples

The following example shows how to display the flow-control port status and statistics:

```
Router
#
show port flowcontrol
Port   Send-Flowcontrol   Receive-Flowcntl   RxPause   TxPause
      Admin   Oper      Admin   Oper
-----
3/1   on     disagree   on     disagree   0         0
3/2   off    off        off    off        0         0
3/3   desired on        desired off      10        10
```

The table below describes the fields shown in the display.

**Table 21: show port flowcontrol Field Descriptions**

Field	Description
Port	Module and port number.
Send-Flowcontrol Admin	Flow-control administration. Possible settings: <ul style="list-style-type: none"> <li>On indicates the local port sends flow control to the far end.</li> <li>Off indicates the local port does not send flow control to the far end.</li> <li>Desired indicates the local end sends flow control to the far end if the far end supports it.</li> </ul>

Field	Description
Send-Flowcontrol Oper	Flow-control operation. Possible settings: <ul style="list-style-type: none"> <li>• Disagree indicates the two ports could not agree on a link protocol.</li> <li>• Off indicates that the local port cannot send flow control to a remote port.</li> </ul>
Receive-Flowcntl Admin	Flow-control administration. Possible settings: <ul style="list-style-type: none"> <li>• On indicates the local port requires the far end to send flow control.</li> <li>• Off indicates the local port does not allow the far end to send flow control.</li> <li>• Desired indicates the local end allows the far end to send flow control.</li> </ul>
Receive-Flowcntl Oper	Flow-control operation. Possible settings: <ul style="list-style-type: none"> <li>• Disagree indicates the two ports could not agree on a link protocol.</li> <li>• Off indicates that the local port cannot receive flow control from a remote port.</li> </ul>
RxPause	Number of pause frames received.
TxPause	Number of pause frames transmitted.

**Related Commands**

Command	Description
<b>set port flowcontrol</b>	Sets the receive flow-control value for a particular Gigabit Ethernet switching module port.

# show rep topology

To display Resilient Ethernet Protocol (REP) topology information for a segment or for all segments, including the primary and secondary edge ports in the segment, use the **show rep topology** command in privileged EXEC mode.

```
show rep topology [segment segment-id] [archive] [detail]
{begin | exclude | include} expression
```

## Syntax Description

<b>segment</b> <i>segment-id</i>	(Optional) The specific segment for which to display REP topology information. The ID range is from 1 to 1024.
<b>archive</b>	(Optional) Display the previous topology of the segment. This keyword can be useful for troubleshooting a link failure.
<b>detail</b>	(Optional) Display detailed REP topology information.
<b>begin</b>	(Optional) Display begins with the line that match the specified expression.
<b>exclude</b>	(Optional) Display excludes line that match the specified expression.
<b>include</b>	(Optional) Display includes line that match the specified expression.
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC (>)

Privileged EXEC (#)

## Command History

Release	Modification
12.2(40)SE	This command was introduced.
12.2(33)SRC	This command was modified. Support was added for the Resilient Ethernet Protocol (REP) on the Cisco 7600 series router.
Cisco IOS XE Release 2.2	This command was modified. This command was implemented on the Cisco ASR 1000 Series Aggregation Services Router.
15.2S	This command was modified. EVC support was added to the command.
15.1(2)SNG	This command was modified. This command was implemented on the Cisco ASR 901 Series Aggregation Services Router. The <b>begin</b> , <b>exclude</b> , and <b>include</b> keywords and the <i>expression</i> argument were added.
15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

## Usage Guidelines

The output of this command is also included in the **show tech-support** privileged EXEC command output.

Expressions are case sensitive. For example, if you enter **exclude output**, the lines that contain *output* are not displayed, but the lines that contain *Output* are displayed.

## Examples

The following is sample output from the **show rep topology segment** command for segment 1. The fields shown in the display are self-explanatory.

```
Router# show rep topology segment 1

REP Segment 1
BridgeName      PortName      Edge Role
-----
sw1_multseg_3750 Gi1/1/1      Pri  Alt
sw3_multseg_3400 Gi0/13              Open
sw3_multseg_3400 Gi0/14              Alt
sw4_multseg_3400 Gi0/13              Open
sw4_multseg_3400 Gi0/14              Open
sw5_multseg_3400 Gi0/13              Open
sw5_multseg_3400 Gi0/14              Open
sw2_multseg_3750 Gi1/1/2              Open
sw2_multseg_3750 Gi1/1/1              Open
sw1_multseg_3750 Gi1/1/2      Sec  Open
```

This example shows output from the **show rep topology detail** command:

```
Router# show rep topology detail

REP Segment 2
repc_2_24ts, Fa0/2 (Primary Edge)
  Alternate Port, some vlans blocked
  Bridge MAC: 0019.e714.5380
  Port Number: 004
  Port Priority: 080
  Neighbor Number: 1 / [-10]
repc_3_12cs, Gi0/1 (Intermediate)
  Open Port, all vlans forwarding
  Bridge MAC: 001a.a292.3580
  Port Number: 001
  Port Priority: 000
  Neighbor Number: 2 / [-9]
repc_3_12cs, Po10 (Intermediate)
  Open Port, all vlans forwarding
  Bridge MAC: 001a.a292.3580
  Port Number: 080
  Port Priority: 000
  Neighbor Number: 3 / [-8]
repc_4_12cs, Po10 (Intermediate)
  Open Port, all vlans forwarding
  Bridge MAC: 001a.a19d.7c80
  Port Number: 080
  Port Priority: 000
  Neighbor Number: 4 / [-7]
repc_4_12cs, Gi0/2 (Intermediate)
  Alternate Port, some vlans blocked
  Bridge MAC: 001a.a19d.7c80
  Port Number: 002
  Port Priority: 040
  Neighbor Number: 5 / [-6]
<output truncated>
```

This example shows output from the **show rep topology segment archive** command:

```
Router# show rep topology segment 1 archive
```

```
REP Segment 1
BridgeName      PortName      Edge Role
-----
sw1_multseg_3750 Gi1/1/1      Pri  Open
sw3_multseg_3400 Gi0/13              Open
sw3_multseg_3400 Gi0/14              Open
sw4_multseg_3400 Gi0/13              Open
sw4_multseg_3400 Gi0/14              Open
sw5_multseg_3400 Gi0/13              Open
sw5_multseg_3400 Gi0/14              Open
sw2_multseg_3750 Gi1/1/2              Alt
sw2_multseg_3750 Gi1/1/1              Open
sw1_multseg_3750 Gi1/1/2      Sec  Open
```

#### Related Commands

Command	Description
<b>rep segment</b>	Enables REP on an interface and assigns a segment ID. This command also configures a port as an edge port, a primary edge port, or a preferred port.



# show spanning-tree

To display spanning-tree information for the specified spanning-tree instances, use the **showspanning-tree** command in privileged EXEC mode.

## Cisco 2600, 3660, and 3845 Series Switches

```
show spanning-tree [bridge-group] [{active | backbonefast | blockedports | bridge | brief |
inconsistentports | interface interface-type interface-number | root | summary [totals] | uplinkfast | vlan
vlan-id}]
```

## Cisco 6500/6000 Catalyst Series Switches and Cisco 7600 Series Routers

```
show spanning-tree [{bridge-group | active | backbonefast | bridge [id] | detail | inconsistentports |
interface interface-type interface-number [portfast [edge]] | mst [{list | configuration [digest]}] | root
| summary [totals] | uplinkfast | vlan vlan-id | port-channel number | pathcost method}]
```

### Syntax Description

<i>bridge-group</i>	(Optional) Specifies the bridge group number. The range is 1 to 255.
<b>active</b>	(Optional) Displays spanning-tree information on active interfaces only.
<b>backbonefast</b>	(Optional) Displays spanning-tree BackboneFast status.
<b>blockedports</b>	(Optional) Displays blocked port information.
<b>bridge</b>	(Optional) Displays status and configuration of this switch.
<b>brief</b>	(Optional) Specifies a brief summary of interface information.
<b>configuration digest</b> ]	(Optional) Displays the multiple spanning-tree current region configuration.
<b>inconsistentports</b>	(Optional) Displays information about inconsistent ports.
<b>interface</b> <i>interface-type interface-number</i>	(Optional) Specifies the type and number of the interface. Enter each interface designator, using a space to separate it from the one before and the one after. Ranges are not supported. Valid interfaces include physical ports and virtual LANs (VLANs). See the “Usage Guidelines” for valid values.
<i>list</i>	(Optional) Specifies a multiple spanning-tree instance list.
<b>mst</b>	(Optional) Specifies multiple spanning-tree.
<b>portfast edge</b> ]	(Optional) Displays spanning-tree PortFast edge interface operational status. Beginning with Cisco IOS Release 12.2(33)SXI, the <b>edge</b> keyword is required. In earlier releases, the <b>edge</b> keyword is not used.
<b>root</b>	(Optional) Displays root-switch status and configuration.
<b>summary</b>	(Optional) Specifies a summary of port states.
<b>totals</b>	(Optional) Displays the total lines of the spanning-tree state section.

<b>uplinkfast</b>	(Optional) Displays spanning-tree UplinkFast status.
<b>vlan</b> <i>vlan-id</i>	(Optional) Specifies the VLAN ID. The range is 1 to 1005. Beginning with Cisco IOS Release 12.4(15)T, the valid VLAN ID range is from 1 to 4094.  If the <i>vlan-id</i> value is omitted, the command applies to the spanning-tree instance for all VLANs.
<i>id</i>	(Optional) Identifies the spanning tree bridge.
<b>detail</b>	(Optional) Shows status and configuration details.
port-channel <i>number</i>	(Optional) Identifies the Ethernet channel associated with the interfaces.
<b>pathcost</b> <i>method</i>	(Optional) Displays the default path-cost calculation method that is used. See the “Usage Guidelines” section for the valid values.

**Command Modes**

Privileged EXEC (#)

**Command History**

Release	Modification
12.0(1)T	This command was introduced.
12.0(5.2)WC(1)	This command was integrated into Cisco IOS Release 12.0(5.2)WC(1).
12.1(6)EA2	This command was integrated into Cisco IOS Release 12.1(6)EA2. The following keywords and arguments were added: <i>bridge-group</i> , <b>active</b> , <b>backbonefast</b> , <b>blockedports</b> , <b>bridge</b> , <b>inconsistentports</b> , <i>pathcostmethod</i> , <b>root</b> , <b>totals</b> , and <b>uplinkfast</b> .
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(15)ZJ	The syntax added in Cisco IOS Release 12.1(6)EA2 was implemented on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.3(4)T	The platform support and syntax added in Cisco IOS Release 12.2(15)ZJ was integrated into Cisco IOS Release 12.3(4)T.
12.4(15)T	This command was modified to extend the range of valid VLAN IDs to 1-4094 for specified platforms.
12.2(33)SXI	This command was modified to require the <b>edge</b> keyword after <b>portfast</b> . The command output was modified to show the status of Bridge Assurance and PVST Simulation.

**Usage Guidelines**

The keywords and arguments that are available with the **showspanning-tree** command vary depending on the platform you are using and the network modules that are installed and operational.

**Cisco 2600, 3660, and 3845 Series Switches**

The valid values for **interface***interface-type* are:

- **fastethernet** --Specifies a Fast Ethernet IEEE 802.3 interface.
- **port-channel** --Specifies an Ethernet channel of interfaces.

### Cisco 6500/6000 Catalyst Switches and 7600 Series Routers

The **port-channel***number* values from 257 to 282 are supported on the Content Switching Module (CSM) and the Firewall Services Module (FWSM) only.

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 2 to 13 and valid values for the port number are from 1 to 48.

When checking spanning tree-active states and you have a large number of VLANs, you can enter the **showspanning-treesummarytotal** command. You can display the total number of VLANs without having to scroll through the list of VLANs.

The valid values for **interface***interface-type* are:

- **fastethernet** --Specifies a Fast Ethernet IEEE 802.3 interface.
- **port-channel** --Specifies an Ethernet channel of interfaces.
- **atm** --Specifies an Asynchronous Transfer Mode (ATM) interface.
- **gigabitethernet** --Specifies a Gigabit Ethernet IEEE 802.3z interface.
- **multilink** --Specifies a multilink-group interface.
- **serial** --Specifies a serial interface.
- **vlan** --Specifies a catalyst VLAN interface.

The valid values for keyword **pathcoast***method* are:

- **append** --Appends the redirected output to a URL (supporting the append operation).
- **begin** --Begins with the matching line.
- **exclude** --Excludes matching lines.
- **include** --Includes matching lines.
- **redirect** --Redirects output to a URL.
- **tee** --Copies output to a URL.

When you run the **showspanning-tree** command for a VLAN or an interface the switch router will display the different port states for the VLAN or interface. The valid spanning-tree port states are listening, learning, forwarding, blocking, disabled, and loopback. See the table below for definitions of the port states:

**Table 22: show spanning-tree vlan Command Port States**

Field	Definition
BLK	Blocked is when the port is still sending and listening to BPDU packets but is not forwarding traffic.

Field	Definition
DIS	Disabled is when the port is not sending or listening to BPDU packets and is not forwarding traffic.
FWD	Forwarding is when the port is sending and listening to BPDU packets and forwarding traffic.
LBK	Loopback is when the port receives its own BPDU packet back.
LIS	Listening is when the port spanning tree initially starts to listen for BPDU packets for the root bridge.
LRN	Learning is when the port sets the proposal bit on the BPDU packets it sends out

## Examples

### Cisco 2600, 3660, and 3845 Series Switches

The following example shows that bridge group 1 is running the VLAN Bridge Spanning Tree Protocol:

```
Router# show spanning-tree 1
Bridge group 1 is executing the VLAN Bridge compatible Spanning Tree Protocol
Bridge Identifier has priority 32768, address 0000.0c37.b055
Configured hello time 2, max age 30, forward delay 20
We are the root of the spanning tree
Port Number size is 10 bits
Topology change flag not set, detected flag not set
Times: hold 1, topology change 35, notification 2
      hello 2, max age 30, forward delay 20
Timers: hello 0, topology change 0, notification 0
      bridge aging time 300

Port 8 (Ethernet1) of Bridge group 1 is forwarding
  Port path cost 100, Port priority 128
  Designated root has priority 32768, address 0000.0c37.b055
  Designated bridge has priority 32768, address 0000.0c37.b055
  Designated port is 8, path cost 0
  Timers: message age 0, forward delay 0, hold 0
  BPDU: sent 184, received 0
```

The following is sample output from the **showspanning-treesummary** command:

```
Router# show spanning-tree summary
UplinkFast is disabled
Name                Blocking Listening Learning Forwarding STP Active
-----
VLAN1                23         0         0         1         24
-----
1 VLAN 23            0         0         0         1         24
-----
```

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

**Table 23: show spanning-tree summary Field Descriptions**

Field	Description
UplinkFast	Indicates whether the spanning-tree UplinkFast feature is enabled or disabled.
Name	Name of VLAN.

Field	Description
Blocking	Number of ports in the VLAN in a blocking state.
Listening	Number of ports in a listening state.
Learning	Number of ports in a learning state.
Forwarding	Number of ports in a forwarding state.
STP Active	Number of ports using the Spanning-Tree Protocol.

The following is sample output from the **showspanning-treebrief** command:

**Router# show spanning-tree brief**

```
VLAN1
  Spanning tree enabled protocol IEEE
  ROOT ID    Priority 32768
             Address 0030.7172.66c4
             Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

VLAN1
  Spanning tree enabled protocol IEEE
  ROOT ID    Priority 32768
             Address 0030.7172.66c4
Port
Name        Port ID Prio Cost Sts Cost Bridge ID Port ID
-----
Fa0/11     128.17 128 100 BLK 38 0404.0400.0001 128.17
Fa0/12     128.18 128 100 BLK 38 0404.0400.0001 128.18
Fa0/13     128.19 128 100 BLK 38 0404.0400.0001 128.19
Fa0/14     128.20 128 100 BLK 38 0404.0400.0001 128.20
Fa0/15     128.21 128 100 BLK 38 0404.0400.0001 128.21
Fa0/16     128.22 128 100 BLK 38 0404.0400.0001 128.22
Fa0/17     128.23 128 100 BLK 38 0404.0400.0001 128.23
Fa0/18     128.24 128 100 BLK 38 0404.0400.0001 128.24
Fa0/19     128.25 128 100 BLK 38 0404.0400.0001 128.25
Fa0/20     128.26 128 100 BLK 38 0404.0400.0001 128.26
Fa0/21     128.27 128 100 BLK 38 0404.0400.0001 128.27
Port
Name        Port ID Prio Cost Sts Cost Bridge ID Port ID
-----
Fa0/22     128.28 128 100 BLK 38 0404.0400.0001 128.28
Fa0/23     128.29 128 100 BLK 38 0404.0400.0001 128.29
Fa0/24     128.30 128 100 BLK 38 0404.0400.0001 128.30 Hello Time 2 sec Max Age 20
sec Forward Delay 15 sec
```

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

**Table 24: show spanning-tree brief Field Descriptions**

Field	Description
VLAN1	VLAN for which spanning-tree information is shown.
Spanning tree enabled protocol	Type of spanning tree (IEEE, IBM, CISCO).
ROOT ID	Indicates the root bridge.
Priority	Priority indicator.

Field	Description
Address	MAC address of the port.
Hello Time	Amount of time, in seconds, that the bridge sends bridge protocol data units (BPDUs).
Max Age	Amount of time, in seconds, that a BPDU packet should be considered valid.
Forward Delay	Amount of time, in seconds, that the port spends in listening or learning mode.
Port Name	Interface type and number of the port.
Port ID	Identifier of the named port.
Prio	Priority associated with the port.
Cost	Cost associated with the port.
Sts	Status of the port.
Designated Cost	Designated cost for the path.
Designated Bridge ID	Bridge identifier of the bridge assumed to be the designated bridge for the LAN associated with the port.

The following is sample output from the **showspanning-treevlan1** command:

```
Router# show spanning-tree vlan 1
Spanning tree 1 is executing the IEEE compatible Spanning Tree protocol
  Bridge Identifier has priority 32768, address 00e0.1eb2.ddc0
  Configured hello time 2, max age 20, forward delay 15
  Current root has priority 32768, address 0010.0b3f.ac80
  Root port is 5, cost of root path is 10
  Topology change flag not set, detected flag not set, changes 1
  Times: hold 1, topology change 35, notification 2
         hello 2, max age 20, forward delay 15
  Timers: hello 0, topology change 0, notification 0
Interface Fa0/1 in Spanning tree 1 is down
  Port path cost 100, Port priority 128
  Designated root has priority 32768, address 0010.0b3f.ac80
Designated bridge has priority 32768, address 00e0.1eb2.ddc0
  Designated port is 1, path cost 10
  Timers: message age 0, forward delay 0, hold 0
  BPDUs: sent 0, received 0
```

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

**Table 25: show spanning-tree vlan Field Descriptions**

Field	Description
Spanning tree	Type of spanning tree (IEEE, IBM, CISCO).
Bridge Identifier	Part of the bridge identifier and taken as the most significant part for bridge ID comparisons.

Field	Description
address	Bridge MAC address.
Root port	Identifier of the root port.
Topology change	Flags and timers associated with topology changes.

The following is sample output from the **showspanning-treeinterfacefastethernet0/3** command:

```
Router# show spanning-tree interface fastethernet0/3
Interface Fa0/3 (port 3) in Spanning tree 1 is down
  Port path cost 100, Port priority 128
  Designated root has priority 6000, address 0090.2bba.7a40
  Designated bridge has priority 32768, address 00e0.1e9f.4abf
  Designated port is 3, path cost 410
  Timers: message age 0, forward delay 0, hold 0
  BPDU: sent 0, received 0
```

### Cisco 6500/6000 Series Catalyst Switches and 7600 Series Routers

This example shows how to display a summary of interface information:

```
Router#
show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    4097
             Address    0004.9b78.0800
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
  Bridge ID  Priority    4097 (priority 4096 sys-id-ext 1)
             Address    0004.9b78.0800
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time 15

Interface    Port ID          Designated          Port ID
Name         Prio.Nbr         Cost Sts            Cost Bridge ID        Prio.Nbr
-----
Gi2/1        128.65           4 LIS              0 4097 0004.9b78.0800 128.65
Gi2/2        128.66           4 LIS              0 4097 0004.9b78.0800 128.66
Fa4/3        128.195          19 LIS             0 4097 0004.9b78.0800 128.195
Fa4/4        128.196          19 BLK             0 4097 0004.9b78.0800 128.195
Router#
```

The table below describes the fields that are shown in the example.

**Table 26: show spanning-tree Command Output Fields**

Field	Definition
Port ID Prio.Nbr	Port ID and priority number.
Cost	Port cost.
Sts	Status information.

This example shows how to display information about the spanning tree on active interfaces only:

```

Router#
show spanning-tree active
UplinkFast is disabled
BackboneFast is disabled
VLAN1 is executing the ieee compatible Spanning Tree protocol
  Bridge Identifier has priority 32768, address 0050.3e8d.6401
  Configured hello time 2, max age 20, forward delay 15
  Current root has priority 16384, address 0060.704c.7000
  Root port is 265 (FastEthernet5/9), cost of root path is 38
  Topology change flag not set, detected flag not set
  Number of topology changes 0 last change occurred 18:13:54 ago
  Times: hold 1, topology change 24, notification 2
         hello 2, max age 14, forward delay 10
  Timers: hello 0, topology change 0, notification 0
Router#

```

This example shows how to display the status of spanning-tree BackboneFast:

```

Router# show spanning-tree backbonefast
BackboneFast is enabled

BackboneFast statistics
-----
Number of transition via backboneFast (all VLANs) : 0
Number of inferior BPDUs received (all VLANs)    : 0
Number of RLQ request PDUs received (all VLANs)  : 0
Number of RLQ response PDUs received (all VLANs) : 0
Number of RLQ request PDUs sent (all VLANs)     : 0
Number of RLQ response PDUs sent (all VLANs)    : 0
Router#

```

This example shows how to display information about the spanning tree for this bridge only:

```

Router# show spanning-tree bridge
VLAN1
  Bridge ID Priority      32768
           Address      0050.3e8d.6401
           Hello Time   2 sec Max Age 20 sec Forward Delay 15 sec
.
Router#

```

This example shows how to display detailed information about the interface:

```

Router#
show spanning-tree detail
VLAN1 is executing the ieee compatible Spanning Tree protocol
  Bridge Identifier has priority 4096, address 00d0.00b8.1401
  Configured hello time 2, max age 20, forward delay 15
  We are the root of the spanning tree
  Topology change flag not set, detected flag not set
  Number of topology changes 9 last change occurred 02:41:34 ago
  from FastEthernet4/21
  Times: hold 1, topology change 35, notification 2
         hello 2, max age 20, forward delay 15
  Timers: hello 1, topology change 0, notification 0, aging 300

Port 213 (FastEthernet4/21) of VLAN1 is forwarding
  Port path cost 19, Port priority 128, Port Identifier 128.213.
  Designated root has priority 4096, address 00d0.00b8.1401
  Designated bridge has priority 4096, address 00d0.00b8.1401
  Designated port id is 128.213, designated path cost 0

```



```
Timers: message age 0, forward delay 0, hold 0
Number of transitions to forwarding state: 1
BPDU: sent 4845, received 1
Router#
```

This example shows how to display information about the spanning tree for a specific interface:

```
Router# show spanning-tree interface fastethernet 5/9
Interface Fa0/10 (port 23) in Spanning tree 1 is ROOT-INCONSISTENT
Port path cost 100, Port priority 128
Designated root has priority 8192, address 0090.0c71.a400
Designated bridge has priority 32768, address 00e0.1e9f.8940
```

This example shows how to display information about the spanning tree for a specific bridge group:

```
Router#
show spanning-tree 1
UplinkFast is disabled
BackboneFast is disabled

Bridge group 1 is executing the ieee compatible Spanning Tree protocol
Bridge Identifier has priority 32768, address 00d0.d39c.004d
Configured hello time 2, max age 20, forward delay 15
Current root has priority 32768, address 00d0.d39b.fddd
Root port is 7 (FastEthernet2/2), cost of root path is 19
Topology change flag set, detected flag not set
Number of topology changes 3 last change occurred 00:00:01 ago
      from FastEthernet2/2
Times: hold 1, topology change 35, notification 2
      hello 2, max age 20, forward delay 15
Timers: hello 0, topology change 0, notification 0 bridge aging time 15

Port 2 (Ethernet0/1/0) of Bridge group 1 is down

Port path cost 100, Port priority 128
Designated root has priority 32768, address 0050.0bab.1808
Designated bridge has priority 32768, address 0050.0bab.1808
Designated port is 2, path cost 0
Timers: message age 0, forward delay 0, hold 0
BPDU: sent 0, received 0
Router#
```

This example shows how to display a summary of port states:

```
Router#
show spanning-tree summary

Root bridge for: Bridge group 1, VLAN0001, VLAN0004-VLAN1005
VLAN1013-VLAN1499, VLAN2001-VLAN4094
EtherChannel misconfiguration guard is enabled
Extended system ID is enabled
Portfast is enabled by default
PortFast BPDU Guard is disabled by default
Portfast BPDU Filter is disabled by default
Loopguard is disabled by default
UplinkFast is disabled
BackboneFast is disabled
Platform PVST Simulation is enabled
Pathcost method used is long
Name          Blocking Listening Learning Forwarding STP Active
-----
1 bridge      0          0          0          1          1
3584 vlans 3584 0 0 7168 10752
```

```

Blocking Listening Learning Forwarding STP Active
-----
Total                3584      0      0      7169      10753
Router#

```

This example shows how to display the total lines of the spanning-tree state section:

```

Router#
show spanning-tree summary total
Root bridge for:Bridge group 10, VLAN1, VLAN6, VLAN1000.
Extended system ID is enabled.
PortFast BPDU Guard is disabled
EtherChannel misconfiguration guard is enabled
UplinkFast is disabled
BackboneFast is disabled
Default pathcost method used is long
Name                Blocking Listening Learning Forwarding STP Active
-----
          105 VLANs 3433      0      0      105      3538

BackboneFast statistics
-----
Number of transition via backboneFast (all VLANs) :0
Number of inferior BPDUs received (all VLANs)   :0
Number of RLQ request PDUs received (all VLANs) :0
Number of RLQ response PDUs received (all VLANs) :0
Number of RLQ request PDUs sent (all VLANs)     :0
Number of RLQ response PDUs sent (all VLANs)    :0
Router#

```

This example shows how to display information about the spanning tree for a specific VLAN:

```

Router#
show spanning-tree vlan 200
VLAN0200
Spanning tree enabled protocol ieee
Root ID Priority 32768
  Address 00d0.00b8.14c8
  This bridge is the root
  Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32768
  Address 00d0.00b8.14c8
  Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
  Aging Time 300
Interface Role Sts Cost Prio.Nbr Status
-----
Fa4/4 Desg FWD 200000 128.196 P2p
Fa4/5 Back BLK 200000 128.197 P2p
Router#

```

The table below describes the fields that are shown in the example.

**Table 27: show spanning-tree vlan Command Output Fields**

Field	Definition
Role	Current 802.1w role; valid values are Boun (boundary), Desg (designated), Root, Altn (alternate), and Back (backup).
Sts	Spanning-tree states; valid values are BKN* (broken) <sup>2</sup> , BLK (blocking), DWN (down), LTN (listening), LBK (loopback), LRN (learning), and FWD (forwarding).

Field	Definition
Cost	Port cost.
Prio.Nbr	Port ID that consists of the port priority and the port number.
Status	<p>Status information; valid values are as follows:</p> <ul style="list-style-type: none"> <li>• P2p/Shr--The interface is considered as a point-to-point (resp. shared) interface by the spanning tree.</li> <li>• Edge--PortFast has been configured (either globally using the <b>default</b> command or directly on the interface) and no BPDU has been received.</li> <li>• *ROOT_Inc, *LOOP_Inc, *PVID_Inc and *TYPE_Inc--The port is in a broken state (BKN*) for an inconsistency. The port would be (respectively) Root inconsistent, Loopguard inconsistent, PVID inconsistent, or Type inconsistent.</li> <li>• Bound(type)--When in MST mode, identifies the boundary ports and specifies the type of the neighbor (STP, RSTP, or PVST).</li> <li>• Peer(STP)--When in PVRST rapid-pvst mode, identifies the port connected to a previous version of the 802.1D bridge.</li> </ul>

<sup>2</sup> For information on the \*, see the definition for the Status field.

This example shows how to determine if any ports are in the root-inconsistent state:

```
Router#
show spanning-tree inconsistentports

Name                Interface                Inconsistency
-----
VLAN1                FastEthernet3/1          Root Inconsistent
Number of inconsistent ports (segments) in the system :1
Router#
```

## Related Commands

Command	Description
<b>spanning-tree backbonefast</b>	Enables BackboneFast on all Ethernet VLANs.
<b>spanning-tree cost</b>	Sets the path cost of the interface for STP calculations.
<b>spanning-tree guard</b>	Enables or disables the guard mode.
<b>spanning-tree pathcost method</b>	Sets the default path-cost calculation method.
<b>spanning-tree portfast (interface configuration mode)</b>	Enables PortFast mode.
<b>spanning-tree portfast bpdupfilter default</b>	Enables BPDU filtering by default on all PortFast ports.
<b>spanning-tree portfast bpduguard default</b>	Enables BPDU guard by default on all PortFast ports.
<b>spanning-tree port-priority</b>	Sets an interface priority when two bridges vie for position as the root bridge.

<b>Command</b>	<b>Description</b>
<b>spanning-tree uplinkfast</b>	Enables UplinkFast.
<b>spanning-tree vlan</b>	Enables the STP on a VLAN.

## show spanning-tree mst

To display the information about the Multiple Spanning Tree (MST) protocol, use the **showspanning-treemst** command in privileged EXEC mode.

```
show spanning-tree mst [{instance-id-number [detail] [interface] | configuration [digest] | detail |
interface interface [detail]}]
```

### Syntax Description

<i>instance-id-number</i>	(Optional) Instance identification number; valid values are from 0 to 4094.
<b>detail</b>	(Optional) Displays detailed information about the MST protocol.
<i>interface</i>	(Optional) Displays the information about the interfaces. The valid interface are <b>atm</b> , <b>gigabitethernet</b> , <b>port-channel</b> , and <b>vlan</b> . See the “Usage Guidelines” section for valid number values.
<b>configuration</b>	(Optional) Displays information about the region configuration.
<b>digest</b>	(Optional) Displays information about the message digest 5 (MD5) algorithm included in the current MST configuration identifier (MSTCI).
<b>interface</b>	(Optional) Displays information about the interface type; possible interface types are <b>ethernet</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>pos</b> , <b>atm</b> , <b>ge-wan</b> , <b>port-channel</b> , and <b>vlan</b> .

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(14)SX	This command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was modified. Support for this command was added for the Supervisor Engine 2.

Release	Modification
12.2(18)SXF	<p>This command was modified. The changes were as follows:</p> <ul style="list-style-type: none"> <li>• The range of valid values for the instance-id-number changed to 0 to 4094.</li> <li>• The output of the <b>show spanning-tree mst configuration</b> command changed as follows: <ul style="list-style-type: none"> <li>• Displays the instance identification from 0 to 4094.</li> <li>• Displays the number of the currently configured instances from 0 to 65.</li> <li>• Adds the <b>digest</b> keyword to display the MD5 digest of the VLAN-to-instance mapping of the MST configuration.</li> </ul> </li> <li>• The output of the <b>show spanning-tree mst detail</b> command changed as follows: <ul style="list-style-type: none"> <li>• The Regional Root field replaced the IST Master field.</li> <li>• The Internal Path field replaced the Path Cost field.</li> <li>• The Designated Regional Root field replaced the Designated IST Master field.</li> <li>• The txholdcount field was added in the Operational parameter line.</li> </ul> </li> <li>• Displays new roles for all MST instances on the common and internal spanning tree (CIST) root port.</li> <li>• Displays the prestandard flag.</li> </ul>
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release XE 3.7S	This command was integrated into Cisco IOS XE Release XE 3.7S.

### Usage Guidelines

The valid values for the *interface* argument depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 2 to 13 and valid values for the port number are from 1 to 48.

The number of valid values for **port-channel number** are a maximum of 64 values ranging from 1 to 282. The **port-channel number** values from 257 to 282 are supported on the Content Switching Module (CSM) and the Firewall Services Module (FWSM) only.

The number of valid values for **vlan** are from 1 to 4094.

In the output display of the **show spanning-tree mst configuration** command, a warning message may be displayed. This message appears if you do not map secondary VLANs to the same instance as the associated primary VLAN. The display includes a list of the secondary VLANs that are not mapped to the same instance as the associated primary VLAN. The warning message is as follows:

```
These secondary vlans are not mapped to the same instance as their primary:
-> 3
```

In the output display of the **show spanning-tree mst configuration digest** command, if the output applies to both standard and prestandard bridges at the same time on a per-port basis, two different digests are displayed.

If you configure a port to transmit prestandard PortFast bridge protocol data units (BPDUs) only, the prestandard flag displays in the **show spanning-tree** commands. The variations of the prestandard flag are as follows:

- Pre-STD (or pre-standard in long format)--This flag is displayed if the port is configured to transmit prestandard BPDUs and if a prestandard neighbor bridge has been detected on this interface.
- Pre-STD-Cf (or pre-standard (config) in long format)--This flag is displayed if the port is configured to transmit prestandard BPDUs but a prestandard BPDUs has not been received on the port, the autodetection mechanism has failed, or a misconfiguration, if there is no prestandard neighbor, has occurred.
- Pre-STD-Rx (or prestandard (rcvd) in long format)--This flag is displayed when a prestandard BPDUs has been received on the port, but it has not been configured to send prestandard BPDUs. The port will send prestandard BPDUs, but Cisco recommends that you change the port configuration so that the interaction with the prestandard neighbor does not rely only on the autodetection mechanism.

If the configuration is not prestandard compliant (for example, a single MST instance has an ID that is greater than or equal to 16,) the prestandard digest is not computed and the following output is displayed:

```
Device# show spanning-tree mst configuration digest

Name      [region1]
Revision  2          Instances configured 3
Digest    0x3C60DBF24B03EBF09C5922F456D18A03
Pre-std Digest  N/A, configuration not pre-standard compatible
```

MST BPDUs include an MSTCI that consists of the region name, region revision, and an MD5 digest of the VLAN-to-instance mapping of the MST configuration.

See the **show spanning-tree mst** command field description table for output descriptions.

## Examples

The following example shows how to display information about the region configuration:

```
Device# show spanning-tree mst configuration
```

```
Name      [train]
Revision  2702
Instance  Vlans mapped
-----
0         1-9,11-19,21-29,31-39,41-4094
1         10,20,30,40
-----
```

The following example shows how to display additional MST-protocol values:

```
Device# show spanning-tree mst 3 detail
```

```
##### MST03 vlans mapped: 3,3000-3999
Bridge address 0002.172c.f400 priority 32771 (32768 sysid 3)
Root this switch for MST03
GigabitEthernet1/1 of MST03 is boundary forwarding
Port info port id 128.1 priority 128
cost 20000
Designated root address 0002.172c.f400 priority 32771
cost 0
Designated bridge address 0002.172c.f400 priority 32771 port
id 128.1
Timers: message expires in 0 sec, forward delay 0, forward transitions 1
Bpdus (MRecords) sent 4, received 0
FastEthernet4/1 of MST03 is designated forwarding
Port info port id 128.193 priority 128 cost
200000
Designated root address 0002.172c.f400 priority 32771
```

```

cost 0
Designated bridge address 0002.172c.f400 priority 32771 port id
128.193
Timers: message expires in 0 sec, forward delay 0, forward transitions 1
Bpdus (MRecords) sent 254, received 1
FastEthernet4/2 of MST03 is backup blocking
Port info port id 128.194 priority 128 cost
200000
Designated root address 0002.172c.f400 priority 32771
cost 0
Designated bridge address 0002.172c.f400 priority 32771 port id
128.193
Timers: message expires in 2 sec, forward delay 0, forward transitions 1
Bpdus (MRecords) sent 3, received 252

```

The following example shows how to display MST information for a specific interface:

```

Device# show spanning-tree mst 0 interface fastethernet 4/1 detail

Edge port: no (trunk) port guard : none
(default)
Link type: point-to-point (point-to-point) bpdu filter: disable
(default)
Boundary : internal bpdu guard : disable
(default)
FastEthernet4/1 of MST00 is designated forwarding
Vlans mapped to MST00 1-2,4-2999,4000-4094
Port info port id 128.193 priority 128 cost
200000
Designated root address 0050.3e66.d000 priority 8193
cost 20004
Designated ist master address 0002.172c.f400 priority 49152
cost 0
Designated bridge address 0002.172c.f400 priority 49152 port id
128.193
Timers: message expires in 0 sec, forward delay 0, forward transitions 1
Bpdus sent 492, received 3

```

The following example shows how to display the MD5 digest included in the current MSTCI:

```

Device# show spanning-tree mst configuration digest

Name      [mst-config]
Revision  10      Instances configured 25
Digest    0x40D5ECA178C657835C83BBCB16723192
Pre-std Digest 0x27BF112A75B72781ED928D9EC5BB4251

```

The following example displays the new primary role for all MST instances at the boundary of the region on the port that is a CIST root port:

```

Device# show spanning-tree mst interface fastethernet4/9

FastEthernet4/9 of MST00 is root forwarding
Edge port: no (default) port guard : none (default)
Link type: point-to-point (auto) bpdu filter: disable (default)
Boundary : boundary (RSTP) bpdu guard : disable (default)
Bpdus sent 3428, received 6771
Instance Role Sts Cost Prio.Nbr Vlans mapped
-----
0 Root FWD 200000 128.201 2-7,10,12-99,101-999,2001-3999,4001-4094
8 Mstr FWD 200000 128.201 8,4000
9 Mstr FWD 200000 128.201 1,9,100
11 Mstr FWD 200000 128.201 11,1000-2000

```

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



Table 28: show spanning-tree mst Field Descriptions

Field	Description
Name	Name of the configured MST.
Revision	Revision number.
Digest	Digest number of the instance.
Instance	Instance number.
Timers	Summary of the timers set for the MST.
Edge port	Status of the port fast.
port guard	Type of port guard.
Link type	The link type.
bpdud filter	Status of the BPDU filter.
Boundary	Boundary type.
bpdud guard	Status of the BPDU guard.
Role	Role of the instance.
Sts	Status of the instance.
Cost	Path cost of the port.
Prio.Nbr	Priority number.
Vlans mapped	Mapped VLANs.

**Related Commands**

Command	Description
<b>spanning-tree mst</b>	Sets the path cost and port-priority parameters for any MST instance.
<b>spanning-tree mst forward-time</b>	Sets the forward-delay timer for all the instances on the Cisco 7600 series router.
<b>spanning-tree mst hello-time</b>	Sets the hello-time delay timer for all the instances on the Cisco 7600 series router.
<b>spanning-tree mst max-hops</b>	Specifies the number of possible hops in the region before a BPDU is discarded.
<b>spanning-tree mst root</b>	Designates the primary and secondary root, sets the bridge priority, and sets the timer value for an instance.

# show spantree

To display spanning-tree information for a virtual LAN (VLAN) or port, use the **showspantree** command in privileged EXEC mode.

**show spantree** [*vlan*] [*active*]

**show spantree** *mod/port*

## Syntax Description

<i>vlan</i>	(Optional) Number of the VLAN; valid values are from 1 to 1001 and from 1025 to 4094.
<b>active</b>	(Optional) Displays only the active ports.
<i>mod / port</i>	Number of the module and the port on the module. The slash mark is required.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.0(7)XE	This command was introduced on the Catalyst 6000 series switches.
12.2(2)XT	This command was implemented on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

## Usage Guidelines

If you do not specify the VLAN number, VLAN 1 is displayed.

If you are in Multiple Instances of Spanning Tree (MISTP) mode, instance information is not displayed.

The maximum length of the channel port list is 47. The space in the Port(s) column might not be enough to display the entire list in one line. If this is the case, the port list is split into multiple lines. For example, in the following display, ports 6/5-8, 6/13, 6/15, 6/17, 6/19 are channeling:

```

.
.
.
Port(s)                Vlan Port-State      Cost      Prio Portfast Channel_id
-----
6/5-8,6/13,6/15,6/17,6/1 1    not-connected 2684354   32   disabled 0
9
.
.
.

```

The Link Aggregation Control Protocol (LACP) for channels does not support half-duplex links. If a port is in active/passive mode and becomes half duplex, the port is suspended (and a syslog message is generated).

The port is shown as “connected” if you use the **showport** command and as “not connected” if you use the **showspantree** command. This discrepancy occurs because the port is physically connected but never joined the active spanning-tree topology. To get the port to join the active spanning-tree topology, either set the duplex to full or set the channel mode to off for that port.

## Examples

The following example shows how to display the active spanning tree port configuration for VLAN 1 while in Per VLAN Spanning Tree (PVST+ mode):

```
Router# (enable) show spantree 1 active
VLAN 1
Spanning tree mode          PVST+
Spanning tree type          ieee
Spanning tree enabled

Designated Root             00-60-70-4c-70-00
Designated Root Priority     16384
Designated Root Cost        19
Designated Root Port        2/3
Root Max Age 14 sec  Hello Time 2 sec  Forward Delay 10 sec

Bridge ID MAC ADDR          00-d0-00-4c-18-00
Bridge ID Priority           32768
Bridge Max Age 20 sec  Hello Time 2 sec  Forward Delay 15 sec

Port              Vlan  Port-State  Cost      Prio  Portfast  Channel_id
-----
2/3                1    forwarding  19        32   disabled  0
2/12               1    forwarding  19        32   disabled  0
```

The following example shows how to display the active spanning-tree port configuration for VLAN 1 (while in MISTP mode):

```
Router# (enable) show spantree 1 active
VLAN 1
Spanning tree mode          MISTP
Spanning tree type          ieee
Spanning tree enabled
VLAN mapped to MISTP Instance: 1
Port              Vlan  Port-State  Cost      Prio  Portfast  Channel_id
-----
2/3                1    forwarding  200000    32   disabled  0
2/12               1    forwarding  200000    32   disabled  0
```

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

**Table 29: show spantree Field Descriptions**

Field	Description
VLAN	VLAN for which the spanning-tree information is shown.
Spanning tree mode	Indicates the current mode that spanning tree is operating in: <ul style="list-style-type: none"> <li>• PVST--Per VLAN Spanning Tree</li> <li>• MSTP--Multiple Spanning Tree Protocol</li> </ul>

Field	Description
Spanning tree type	Indicates the current Spanning Tree Protocol type: <ul style="list-style-type: none"> <li>• IEEE--IEEE Spanning Tree</li> <li>• DEC--Digital Equipment Corporation Spanning Tree</li> </ul>
Spanning tree enabled	Indicates whether Spanning Tree Protocol is enabled or disabled.
Designated Root	MAC address of the designated spanning-tree root bridge.
Designated Root Priority	Priority of the designated root bridge.
Designated Root Cost	Total path cost to reach the root.
Designated Root Port	Port through which the root bridge can be reached. (Shown only on nonroot bridges.)
Root Max Age	Amount of time a bridge packet data unit (BPDU) packet should be considered valid.
Hello Time	Number of times the root bridge sends BPDUs.
Forward Delay	Amount of time the port spends in listening or learning mode.
Port	Port number.
Vlan	VLAN to which the port belongs.
Port-State	Spanning tree port state (disabled, inactive, not-connected, blocking, listening, learning, forwarding, bridging, or type-pvid-inconsistent).
Cost	Cost associated with the port.
Prio	Priority associated with the port.
Portfast	Status of whether the port is configured to use the PortFast feature.
Channel_id	Channel ID number.

### Related Commands

Command	Description
<b>show spantree backbonefast</b>	Displays whether the spanning-tree BackboneFast Convergence feature is enabled.
<b>show spantree blockedports</b>	Displays only the blocked ports on a per-VLAN or per-instance basis.
<b>show spantree portvlancost</b>	Shows the path cost for the VLANs or extended-range VLANs.
<b>show spantree statistics</b>	Shows spanning tree statistical information
<b>show spantree summary</b>	Displays a summary of spanning-tree information.
<b>show spantree uplinkfast</b>	Shows the UplinkFast feature settings.

## show ssl-proxy module state

To display the spanning-tree state for the specified VLAN, enter the **showssl-proxymodulestate** command in user EXEC mode.

**show ssl-proxy module *mod* state**

### Syntax Description

<i>mod</i>	Module number.
------------	----------------

### Command Modes

User EXEC (>)

### Command History

Release	Modification
12.2(18)SXD	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

### Usage Guidelines

This command is supported on Cisco 7600 series routers that are configured with a Secure Sockets Layer (SSL) Services Module only.

### Examples

This example shows how to verify that the VLAN information displayed matches the VLAN configuration. The fields shown in the display are self-explanatory.

```
Router# show ssl-proxy module 6 state
SSL-services module 6 data-port:
  Switchport:Enabled
Administrative Mode:trunk
Operational Mode:trunk
Administrative Trunking Encapsulation:dot1q
Operational Trunking Encapsulation:dot1q
Negotiation of Trunking:Off
Access Mode VLAN:1 (default)
Trunking Native Mode VLAN:1 (default)
Trunking VLANs Enabled:100
Pruning VLANs Enabled:2-1001
Vlans allowed on trunk:100
Vlans allowed and active in management domain:100
Vlans in spanning tree forwarding state and not pruned:
100
Allowed-vlan :100
Router#
```

### Related Commands

Command	Description
<b>ssl-proxy module allowed-vlan</b>	Adds the VLANs allowed over the trunk to the SSL Services Module.

# show uddl

To display the administrative and operational UniDirectional Link Detection Protocol (UDLD) statuses, use the **show uddl** command in user EXEC mode.

**show uddl** [{*interface-id* | **neighbors**}]

Syntax Description	
<i>interface-id</i>	(Optional) Interface name and number.
<b>neighbors</b>	(Optional) Displays only the neighbor information.

**Command Modes** User EXEC (>)

Command History	Release	Modification
	12.2(14)SX	This command was introduced.
	12.2(17D)SXB	This command was integrated into Cisco IOS Release 12.2(17D)SXB.
	12.2(18)SXD	This command was modified. The <b>neighbors</b> keyword was added.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	Cisco IOS XE Release 3.9S	This command was integrated into Cisco IOS XE Release 3.9S.

**Usage Guidelines** If you do not enter an *interface-id* value, the administrative and operational UDLD statuses for all interfaces are displayed.

## Examples

The following example shows how to display the UDLD state for a single interface. The fields shown in the display are self-explanatory.

```
Router# show uddl gigabitethernet2/2

Interface Gi2/2
---
Port enable administrative configuration setting: Follows device default
Port enable operational state: Enabled
Current bidirectional state: Bidirectional
Current operational state: Advertisement
Message interval: 60
Time out interval: 5
No multiple neighbors detected
  Entry 1
  ---
  Expiration time: 146
  Device ID: 1
  Current neighbor state: Bidirectional
  Device name: 0050e2826000
  Port ID: 2/1
  Neighbor echo 1 device: SAD03160954
  Neighbor echo 1 port: Gi1/1
  Message interval: 5
```

```
CDP Device name: 066527791
```

The following example shows how to view the neighbor information. The fields shown in the display are self-explanatory.

```
Router# show udd neighbors
```

```
Port      Device Name                Device ID  Port-ID OperState
-----
Gi3/1     SAL0734K5R2                1         Gi4/1  Bidirectional
Gi4/1     SAL0734K5R2                1         Gi3/1  Bidirectional
```

### Related Commands

Command	Description
<b>udd</b>	Enables the aggressive mode or the normal mode in UDLD and sets the configurable message time.
<b>udd port</b>	Enables UDLD on the Ethernet interface or enables UDLD in the aggressive mode on the Ethernet interface.
<b>udd recovery</b>	Enables the recovery timer for the UDLD error-disabled state.
<b>udd reset</b>	Resets all the LAN ports that are error disabled by UDLD.

