

# rmon collection stats

Use the **rmon collection stats** interface configuration command to collect Ethernet group statistics, which include usage statistics about broadcast and multicast packets, and error statistics about cyclic redundancy check (CRC) alignment errors and collisions. Use the **no** form of this command to return to the default setting.

**rmon collection stats** *index* [*owner name*]

**no rmon collection stats** *index* [*owner name*]

<b>Syntax Description</b>	<i>index</i>	Remote Network Monitoring (RMON) collection control index. The range is 1 to 65535.
	<i>owner name</i>	(Optional) Owner of the RMON collection.

**Defaults** The RMON statistics collection is disabled.

**Command Modes** Interface configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** The RMON statistics collection command is based on hardware counters.

**Examples** This example shows how to collect RMON statistics for the owner *root*:

```
Switch(config)# interface gigabitethernet0/1
Switch(config-if)# rmon collection stats 2 owner root
```

You can verify your setting by entering the **show rmon statistics** privileged EXEC command.

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>show rmon statistics</b>	Displays RMON statistics.  For syntax information, select <b>Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 &gt; System Management Commands &gt; RMON Commands</b> .

# sdm prefer

Use the **sdm prefer** global configuration command on the switch to configure the template used in Switch Database Management (SDM) resource allocation. You can use a template to allocate system resources to best support the features being used in your application. Use a template to provide maximum system usage for unicast routing or for VLAN configuration or to select the dual IPv4 and IPv6 template to support IPv6 forwarding. Use the **no** form of this command to return to the default template.

```
sdm prefer {access | default | dual-ipv4-and-ipv6 {default | routing | vlan} | routing | vlan}
[desktop]
```

```
no sdm prefer
```

Syntax Description	
<b>access</b>	Provide maximum system usage for access control lists (ACLs). Use this template if you have a large number of ACLs.
<b>default</b>	Give balance to all functions.
<b>dual-ipv4-and-ipv6</b> { <b>default</b>   <b>routing</b>   <b>vlan</b> }	Select a template that supports both IPv4 and IPv6 routing. <ul style="list-style-type: none"> <li>• <b>default</b>—Provide balance to IPv4 and IPv6 Layer 2 and Layer 3 functionality.</li> <li>• <b>routing</b>—Provide maximum system usage for IPv4 and IPv6 host, including IPv4 policy-based routing.</li> <li>• <b>vlan</b>—Provide maximum system usage for IPv4 and IPv6 VLANs.</li> </ul>
<b>routing</b>	Provide maximum system usage for unicast routing. You would typically use this template for a router or aggregator in the middle of a network.
<b>vlan</b>	Provide maximum system usage for VLANs. This template maximizes system resources for use as a Layer 2 switch with no routing.

**Defaults** The default template provides a balance to all features.

**Command Modes** Global configuration

Command History	Release	Modification
	12.2.44(SE)	This command was introduced.

**Usage Guidelines**

You must reload the switch for the configuration to take effect. If you enter the **show sdm prefer** command before you enter the **reload** privileged EXEC command, the **show sdm prefer** command shows the template currently in use and the template that will become active after a reload.

Use the **no sdm prefer** command to set the switch to the default template. The default templates balances the use of system resources.

The access template maximizes system resources for access control lists (ACLs) as required to accommodate a large number of ACLs.

Use the **sdm prefer vlan [desktop]** global configuration command only on switches intended for Layer 2 switching with no routing. When you use the VLAN template, no system resources are reserved for routing entries, and any routing is done through software. This overloads the CPU and severely degrades routing performance.

Do not use the routing template if you do not have routing enabled on your switch. Entering the **sdm prefer routing** global configuration command prevents other features from using the memory allocated to unicast routing in the routing template.

Do not use the ipv4-and-ipv6 templates if you do not plan to enable IPv6 on the switch. Entering the **sdm prefer ipv4-and-ipv6 {default | routing | vlan}** global configuration command divides resources between IPv4 and IPv6, limiting those allocated to IPv4 forwarding.

Table 2-15 lists the approximate number of each resource supported in each of the IPv4-only templates for a switch. The values in the template are based on eight routed interfaces and approximately one thousand VLANs and represent the approximate hardware boundaries set when a template is selected. If a section of a hardware resource is full, all processing overflow is sent to the CPU, seriously impacting switch performance.

**Table 2-15 Approximate Number of Feature Resources Allowed by Each IPv4 Template**

Resource	Access	Default	Routing	VLAN
Unicast MAC addresses	4 K	6 K	3 K	12 K
IGMP groups and multicast routes	1 K	1 K	1 K	1 K
Unicast routes	6 K	8 K	11 K	0
• Directly connected hosts	4 K	6 K	3 K	0
• Indirect routes	2 K	2 K	8 K	0
Policy-based routing ACEs <sup>1</sup>	0.5 K	0	0.5 K	0
QoS classification ACEs	0.75K	0.75K	0.75K	0.75K
Security ACEs	2 K	1 K	1 K	1 K

1. Policy-based routing is not supported in the IP base image on the switch.

Table 2-16 lists the approximate number of each resource supported in each of the dual IPv4-and IPv6 templates.

**Table 2-16 Approximate Feature Resources Allowed by Dual IPv4-IPv6 Templates**

Resource	IPv4-and-IPv6 Default	IPv4-and-IPv6 Routing	IPv4-and-IPv6 VLAN
Unicast MAC addresses	2 K	1.5 K	8 K
IPv4 IGMP groups and multicast routes	1 K	1K	1 K
Total IPv4 unicast routes:	3 K	2.75 K	0
• Directly connected IPv4 hosts	2 K	1.5 K	0
• Indirect IPv4 routes	1 K	1.25 K	0
IPv6 multicast groups	1.125 K	1.125 K	1.125 K
Total IPv6 unicast routes:	3 K	2.75 K	0
• Directly connected IPv6 addresses	2 K	1.5 K	0

**Table 2-16** Approximate Feature Resources Allowed by Dual IPv4-IPv6 Templates (continued)

Resource	IPv4-and-IPv6 Default	IPv4-and-IPv6 Routing	IPv4-and-IPv6 VLAN
• Indirect IPv6 unicast routes	1 K	1.25 K	0
IPv4 policy-based routing ACEs <sup>1</sup>	0	0.25 K	0
IPv4 or MAC QoS ACEs (total)	0.75 K	0.75 K	0.75 K
IPv4 or MAC security ACEs (total)	1 K	0.5 K	1K
IPv6 policy-based routing ACEs <sup>1</sup>	0	0.25 K	0
IPv6 QoS ACEs	0.5 K	0.5 K	0.5 K
IPv6 security ACEs <sup>2</sup>	0.5 K	0.5 K	0.5 K

1. Not supported in the IP base image that runs on the switch.

2. The switch supports only input IPv6 router ACLs for management traffic.

**Note**

Although these features are visible in the template in the CLI, the switch does not support IPv4 or IPv6 policy-based routing or IPv6 QoS ACLs.

**Examples**

This example shows how to configure the access template on a switch:

```
Switch(config)# sdm prefer access
Switch(config)# exit
Switch# reload
```

This example shows how to configure the routing template on a switch:

```
Switch(config)# sdm prefer routing
Switch(config)# exit
Switch# reload
```

This example shows how to configure the dual IPv4-and-IPv6 default template on a switch:

```
Switch(config)# sdm prefer dual-ipv4-and-ipv6 default
Switch(config)# exit
Switch# reload
```

This example shows how to configure the default template:

```
Switch(config)# sdm prefer default
Switch(config)# exit
Switch# reload
```

You can verify your settings by entering the **show sdm prefer** privileged EXEC command.

**Related Commands**

Command	Description
<a href="#">show sdm prefer</a>	Displays the current SDM template in use or displays the templates that can be used, with approximate resource allocation per feature.

# service password-recovery

Use the **service password-recovery** global configuration command to enable the password-recovery mechanism (the default). This mechanism allows an end user with physical access to the switch to hold down the **Mode** button and interrupt the bootup process while the switch is powering up and to assign a new password. Use the **no** form of this command to disable part of the password-recovery functionality. When the password-recovery mechanism is disabled, interrupting the bootup process is allowed only if the user agrees to set the system back to the default configuration.

**service password-recovery**

**no service password-recovery**

<b>Syntax Description</b>	This command has no arguments or keywords.
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<b>Defaults</b>	The password-recovery mechanism is enabled.
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

<b>Usage Guidelines</b>	As a system administrator, you can use the <b>no service password-recovery</b> command to disable some of the functionality of the password recovery feature by allowing an end user to reset a password only by agreeing to return to the default configuration.
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To use the password-recovery procedure, a user with physical access to the switch restarts the switch and then enters the break key to interrupt the bootup sequence.



## Note

The break key character is different for each operating system.

On a SUN work station running UNIX, Ctrl-C is the break key.

On a PC running Hyperterminal on Windows XP or 2000, Ctrl-Break is the break key.

Cisco TAC has tabulated break keys for most common operating systems and an alternative *break key sequence* for those terminal emulators that do not support the break keys. See <http://www.cisco.com/warp/public/701/61.html#how-to> for that list.

For instructions on how to use the break key to enter the bootloader mode, see the software configuration guide for this release.

If the password-recovery mechanism is disabled, this message appears:

```
The password-recovery mechanism has been triggered, but
is currently disabled. Access to the boot loader prompt
through the password-recovery mechanism is disallowed at
this point. However, if you agree to let the system be
reset back to the default system configuration, access
to the boot loader prompt can still be allowed.
```

```
Would you like to reset the system back to the default configuration (y/n)?
```

If the user chooses not to reset the system to the default configuration, the normal bootup process continues, as if the break key had not been entered. If you choose to reset the system to the default configuration, the configuration file in flash memory is deleted, and the VLAN database file, *flash:vlan.dat* (if present), is deleted.

If the password-recovery mechanism is enabled, this message appears:

```
The system has been interrupted prior to initializing the flash file system. The following
commands will initialize the flash file system, and finish loading the operating system
software#
```

```
flash_init
load_helper
boot
```



#### Note

If you use the **no service password-recovery** command to control end user access to passwords, we recommend that you save a copy of the config file in a location away from the switch in case the end user uses the password recovery procedure and sets the system back to default values. Do not keep a backup copy of the config file on the switch.

If the switch is operating in VTP transparent mode, we recommend that you also save a copy of the *vlan.dat* file in a location away from the switch.

You can verify if password recovery is enabled or disabled by entering the **show version** privileged EXEC command.

#### Examples

This example shows how to disable password recovery on a switch so that a user can only reset a password by agreeing to return to the default configuration.

```
Switch(config)# no service-password recovery
Switch(config)# exit
```

#### Related Commands

Command	Description
<a href="#">show version</a>	Displays version information for the hardware and firmware.

# service-policy

Use the **service-policy** interface configuration command on the switch to apply a policy map defined by the **policy-map** command to the input of a physical port or a switch virtual interface (SVI). Use the **no** form of this command to remove the policy map and port association.

**service-policy input** *policy-map-name*

**no service-policy input** *policy-map-name*

## Syntax Description

**input** *policy-map-name* Apply the specified policy map to the input of a physical port or an SVI.



### Note

Though visible in the command-line help strings, the **history** keyword is not supported, and you should ignore the statistics that it gathers. The **output** keyword is also not supported.

## Defaults

No policy maps are attached to the port.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

Policy maps can be configured on physical ports or on SVIs. When VLAN-based quality of service (QoS) is disabled by using the **no mls qos vlan-based** interface configuration command on a physical port, you can configure a port-based policy map on the port. If VLAN-based QoS is enabled by using the **mls qos vlan-based** interface configuration command on a physical port, the switch removes the previously configured port-based policy map. After a hierarchical policy map is configured and applied on an SVI, the interface-level policy map takes effect on the interface.

You can apply a policy map to incoming traffic on a physical port or on an SVI. You can configure different interface-level policy maps for each class defined in the VLAN-level policy map. For more information about hierarchical policy maps, see the “Configuring QoS” chapter in the software configuration guide for this release.

Classification using a port trust state (for example, **mls qos trust [cos | dscp | ip-precedence]** and a policy map (for example, **service-policy input** *policy-map-name*) are mutually exclusive. The last one configured overwrites the previous configuration.

## Examples

This example shows how to apply *plcmap1* to an physical ingress port:

```
Switch(config)# interface gigabitethernet0/1
Switch(config-if)# service-policy input plcmap1
```

This example shows how to remove *plcmap2* from a physical port:

```
Switch(config)# interface gigabitethernet0/2
Switch(config-if)# no service-policy input plcmap2
```

This example shows how to apply *plcmap1* to an ingress SVI when VLAN-based QoS is enabled:

```
Switch(config)# interface vlan 10
Switch(config-if)# service-policy input plcmap1
```

This example shows how to create a hierarchical policy map and attach it to an SVI:

```
Switch>enable
Switch#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#access-list 101 permit ip any any
Switch(config)#class-map cm-1
Switch(config-cmap)#match access 101
Switch(config-cmap)#exit
Switch(config)#exit
Switch#
Switch#
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#class-map cm-interface-1
Switch(config-cmap)#match input gigabitethernet0/1 - gigabitethernet0/2
Switch(config-cmap)#exit
Switch(config)#policy-map port-plcmap
Switch(config-pmap)#class-map cm-interface-1
Switch(config-pmap-c)#police 900000 9000 exc policed-dscp-transmit
Switch(config-pmap-c)#exit
Switch(config-pmap)#exit
Switch(config)#policy-map vlan-plcmap
Switch(config-pmap)#class-map cm-1
Switch(config-pmap-c)#set dscp 7
Switch(config-pmap-c)#service-policy port-plcmap-1
Switch(config-pmap-c)#exit
Switch(config-pmap)#class-map cm-2
Switch(config-pmap-c)#match ip dscp 2
Switch(config-pmap-c)#service-policy port-plcmap-1
Switch(config-pmap)#exit
Switch(config-pmap)#class-map cm-3
Switch(config-pmap-c)#match ip dscp 3
Switch(config-pmap-c)#service-policy port-plcmap-2
Switch(config-pmap-c)#exit
Switch(config-pmap)#class-map cm-4
Switch(config-pmap-c)#trust dscp
Switch(config-pmap-c)#exit
Switch(config)#int vlan 10
Switch(config-if)#
Switch(config-if)#ser input vlan-plcmap
Switch(config-if)#exit
Switch(config)#exit
Switch#
```

You can verify your settings by entering the **show running-config** privileged EXEC command.



Related Commands	Command	Description
	<a href="#">policy-map</a>	Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.
	<a href="#">show policy-map</a>	Displays QoS policy maps.
	<a href="#">show running-config</a>	Displays the running configuration on the switch. For syntax information, select <b>Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 &gt; File Management Commands &gt; Configuration File Management Commands</b> .

# set

Use the **set** policy-map class configuration command to classify IP traffic by setting a Differentiated Services Code Point (DSCP) or an IP-precedence value in the packet. Use the **no** form of this command to remove traffic classification.

```
set { dscp new-dscp | [ip] precedence new-precedence }

no set { dscp new-dscp | [ip] precedence new-precedence }
```

## Syntax Description

<b>dscp</b> <i>new-dscp</i>	New DSCP value assigned to the classified traffic. The range is 0 to 63. You also can enter a mnemonic name for a commonly used value.
<b>[ip] precedence</b> <i>new-precedence</i>	New IP-precedence value assigned to the classified traffic. The range is 0 to 7. You also can enter a mnemonic name for a commonly used value.

## Defaults

No traffic classification is defined.

## Command Modes

Policy-map class configuration

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

If you have used the **set ip dscp** policy-map class configuration command, the switch changes this command to **set dscp** in the switch configuration. If you enter the **set ip dscp** policy-map class configuration command, this setting appears as **set dscp** in the switch configuration.

You can use the **set ip precedence** policy-map class configuration command or the **set precedence** policy-map class configuration command. This setting appears as **set ip precedence** in the switch configuration.

The **set** command is mutually exclusive with the **trust** policy-map class configuration command within the same policy map.

For the **set dscp** *new-dscp* or the **set ip precedence** *new-precedence* command, you can enter a mnemonic name for a commonly used value. For example, you can enter the **set dscp af11** command, which is the same as entering the **set dscp 10** command. You can enter the **set ip precedence critical** command, which is the same as entering the **set ip precedence 5** command. For a list of supported mnemonics, enter the **set dscp ?** or the **set ip precedence ?** command to see the command-line help strings.

To return to policy-map configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command.

## Examples

This example shows how to assign DSCP 10 to all FTP traffic without any policers:

```
Switch(config)# policy-map policy_ftp
Switch(config-pmap)# class ftp_class
Switch(config-pmap-c)# set dscp 10
Switch(config-pmap)# exit
```

You can verify your settings by entering the **show policy-map** privileged EXEC command.

## Related Commands

Command	Description
<b>class</b>	Defines a traffic classification match criteria (through the <b>police</b> , <b>set</b> , and <b>trust</b> policy-map class configuration commands) for the specified class-map name.
<b>police</b>	Defines a policer for classified traffic.
<b>policy-map</b>	Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.
<b>show policy-map</b>	Displays QoS policy maps.
<b>trust</b>	Defines a trust state for traffic classified through the <b>class</b> policy-map configuration command or the <b>class-map</b> global configuration command.

# setup

Use the **setup** privileged EXEC command to configure the switch with its initial configuration.

## setup

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

**Command Modes** Privileged EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** When you use the **setup** command, make sure that you have this information:

- IP address and network mask
- Password strategy for your environment

When you enter the **setup** command, an interactive dialog, called the System Configuration Dialog, appears. It guides you through the configuration process and prompts you for information. The values shown in brackets next to each prompt are the default values last set by using either the **setup** command facility or the **configure** privileged EXEC command.

Help text is provided for each prompt. To access help text, press the question mark (?) key at a prompt.

To return to the privileged EXEC prompt without making changes and without running through the entire System Configuration Dialog, press **Ctrl-C**.

When you complete your changes, the setup program shows you the configuration command script that was created during the setup session. You can save the configuration in NVRAM or return to the setup program or the command-line prompt without saving it.

**Examples** This is an example of output from the **setup** command:

```
Switch# setup
--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: yes

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system.

Would you like to enter basic management setup? [yes/no]: yes
Configuring global parameters:
```

Enter host name [Switch]:*host-name*

The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.

Enter enable secret: *enable-secret-password*

The enable password is used when you do not specify an enable secret password, with some older software versions, and some boot images.

Enter enable password: *enable-password*

The virtual terminal password is used to protect access to the router over a network interface.

Enter virtual terminal password: *terminal-password*

Configure SNMP Network Management? [no]: **yes**

Community string [public]:

Current interface summary

Any interface listed with OK? value "NO" does not have a valid configuration

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	172.20.135.202	YES	NVRAM	up	up
GigabitEthernet0/1	unassigned	YES	unset	up	up
GigabitEthernet0/2	unassigned	YES	unset	up	down

<output truncated>

Port-channel1	unassigned	YES	unset	up	down
---------------	------------	-----	-------	----	------

Enter interface name used to connect to the management network from the above interface summary: **vlan1**

Configuring interface vlan1:

Configure IP on this interface? [yes]: **yes**

IP address for this interface: *ip\_address*

Subnet mask for this interface [255.0.0.0]: *subnet\_mask*

The following configuration command script was created:

```
hostname host-name
enable secret 5 $1$LiBw$0XclwyT.PXPkuhFwqyhVi0
enable password enable-password
line vty 0 15
password terminal-password
snmp-server community public
!
no ip routing
!
interface GigabitEthernet0/1
no ip address
!
interface GigabitEthernet0/2
no ip address
!
```

Use this configuration? [yes/no]: **yes**

!

[0] Go to the IOS command prompt without saving this config.

[1] Return back to the setup without saving this config.

[2] Save this configuration to nvram and exit.

Enter your selection [2]:

Related Commands	Command	Description
	show running-config	Displays the running configuration on the switch. For syntax information, select <b>Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 &gt; File Management Commands &gt; Configuration File Management Commands</b> .
	<a href="#">show version</a>	Displays version information for the hardware and firmware.

# show access-lists

Use the **show access-lists** privileged EXEC command to display access control lists (ACLs) configured on the switch.

**show access-lists** [*name* | *number* | **hardware counters** | **ipc**] [ | { **begin** | **exclude** | **include** } *expression*]

Syntax Description	
<i>name</i>	(Optional) Name of the ACL.
<i>number</i>	(Optional) ACL number. The range is 1 to 2699.
<b>hardware counters</b>	(Optional) Display global hardware ACL statistics for switched and routed packets.
<b>ipc</b>	(Optional) Display Interprocess Communication (IPC) protocol access-list configuration download information.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.



## Note

Though visible in the command-line help strings, the **rate-limit** keywords are not supported.

Command Modes	Privileged EXEC
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Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	<p>The switch supports only IP standard and extended access lists. Therefore, the allowed numbers are only 1 to 199 and 1300 to 2699.</p> <p>This command also displays the MAC ACLs that are configured.</p> <p>Expressions are case sensitive. For example, if you enter   <b>exclude output</b>, the lines that contain <i>output</i> are not displayed, but the lines that contain <i>Output</i> are displayed.</p>
------------------	---

Examples	This is an example of output from the <b>show access-lists</b> command:
----------	---

```
Switch# show access-lists
Standard IP access list 1
 10 permit 1.1.1.1
 20 permit 2.2.2.2
 30 permit any
 40 permit 0.255.255.255, wildcard bits 12.0.0.0
```

```

Standard IP access list videowizard_1-1-1-1
  10 permit 1.1.1.1
Standard IP access list videowizard_10-10-10-10
  10 permit 10.10.10.10
Extended IP access list 121
  10 permit ahp host 10.10.10.10 host 20.20.10.10 precedence routine
Extended IP access list CMP-NAT-ACL
  Dynamic Cluster-HSRP deny ip any any
  10 deny ip any host 19.19.11.11
  20 deny ip any host 10.11.12.13
  Dynamic Cluster-NAT permit ip any any
  10 permit ip host 10.99.100.128 any
  20 permit ip host 10.46.22.128 any
  30 permit ip host 10.45.101.64 any
  40 permit ip host 10.45.20.64 any
  50 permit ip host 10.213.43.128 any
  60 permit ip host 10.91.28.64 any
  70 permit ip host 10.99.75.128 any
  80 permit ip host 10.38.49.0 any

```

This is an example of output from the **show access-lists hardware counters** command:

Switch# **show access-lists hardware counters**

#### L2 ACL INPUT Statistics

```

Drop: All frame count: 855
Drop: All bytes count: 94143
Drop And Log: All frame count: 0
Drop And Log: All bytes count: 0
Bridge Only: All frame count: 0
Bridge Only: All bytes count: 0
Bridge Only And Log: All frame count: 0
Bridge Only And Log: All bytes count: 0
Forwarding To CPU: All frame count: 0
Forwarding To CPU: All bytes count: 0
Forwarded: All frame count: 2121
Forwarded: All bytes count: 180762
Forwarded And Log: All frame count: 0
Forwarded And Log: All bytes count: 0

```

#### L3 ACL INPUT Statistics

```

Drop: All frame count: 0
Drop: All bytes count: 0
Drop And Log: All frame count: 0
Drop And Log: All bytes count: 0
Bridge Only: All frame count: 0
Bridge Only: All bytes count: 0
Bridge Only And Log: All frame count: 0
Bridge Only And Log: All bytes count: 0
Forwarding To CPU: All frame count: 0
Forwarding To CPU: All bytes count: 0
Forwarded: All frame count: 13586
Forwarded: All bytes count: 1236182
Forwarded And Log: All frame count: 0
Forwarded And Log: All bytes count: 0

```

#### L2 ACL OUTPUT Statistics

```

Drop: All frame count: 0
Drop: All bytes count: 0
Drop And Log: All frame count: 0
Drop And Log: All bytes count: 0
Bridge Only: All frame count: 0
Bridge Only: All bytes count: 0
Bridge Only And Log: All frame count: 0
Bridge Only And Log: All bytes count: 0

```



```

Forwarding To CPU: All frame count: 0
Forwarding To CPU: All bytes count: 0
Forwarded: All frame count: 232983
Forwarded: All bytes count: 16825661
Forwarded And Log: All frame count: 0
Forwarded And Log: All bytes count: 0

L3 ACL OUTPUT Statistics
Drop: All frame count: 0
Drop: All bytes count: 0
Drop And Log: All frame count: 0
Drop And Log: All bytes count: 0
Bridge Only: All frame count: 0
Bridge Only: All bytes count: 0
Bridge Only And Log: All frame count: 0
Bridge Only And Log: All bytes count: 0
Forwarding To CPU: All frame count: 0
Forwarding To CPU: All bytes count: 0
Forwarded: All frame count: 514434
Forwarded: All bytes count: 39048748
Forwarded And Log: All frame count: 0
Forwarded And Log: All bytes count: 0

```

**Related Commands**

Command	Description
<b>access-list</b>	Configures a standard or extended numbered access list on the switch. For syntax information, select <b>Cisco IOS IP Command Reference, Volume 1 of 3:Addressing and Services, Release 12.2 &gt; IP Services Commands</b> .
<b>ip access list</b>	Configures a named IP access list on the switch. For syntax information, select <b>Cisco IOS IP Command Reference, Volume 1 of 3:Addressing and Services, Release 12.2 &gt; IP Services Commands</b> .
<b>mac access-list extended</b>	Configures a named or numbered MAC access list on the switch.

# show archive status

Use the **show archive status** privileged EXEC command to display the status of a new image being downloaded to a switch with the HTTP or the TFTP protocol.

**show archive status** [ | { **begin** | **exclude** | **include** } *expression* ]

## Syntax Description

<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

If you use the **archive download-sw** privileged EXEC command to download an image to a TFTP server, the output of the **archive download-sw** command shows the status of the download.

If you do not have a TFTP server, you can use the embedded device manager to download the image by using HTTP. The **show archive status** command shows the progress of the download.

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

These are examples of output from the **show archive status** command:

```
Switch# show archive status
IDLE: No upgrade in progress
```

```
Switch# show archive status
LOADING: Upgrade in progress
```

```
Switch# show archive status
EXTRACT: Extracting the image
```

```
Switch# show archive status
VERIFY: Verifying software
```

```
Switch# show archive status
RELOAD: Upgrade completed. Reload pending
```

## Related Commands

Command	Description
<a href="#">archive download-sw</a>	Downloads a new image from a TFTP server to the switch.

# show authentication

Use the **show authentication** command (in either user EXEC or privileged EXEC mode) to display information about authentication manager events on the switch.

**show authentication** {**interface** *interface-id* | **registrations** | **sessions** [**session-id** *session-id*] [**handle** *handle*] [**interface** *interface-id*] [**mac** *mac*] [**method** *method*]}

<b>Syntax Description</b>	<b>interface</b> <i>interface-id</i>	(Optional) Display all of the authentication manager details for the specified interface.
	<b>method</b> <i>method</i>	(Optional) Displays all clients authorized by a specified authentication method ( <b>dot1x</b> , <b>mab</b> , or <b>webauth</b> )
	<b>registrations</b>	(Optional) Display authentication manager registrations
	<b>sessions</b>	(Optional) Display detail of the current authentication manager sessions (for example, client devices). If you do not enter any optional specifiers, all current active sessions are displayed. You can enter the specifiers singly or in combination to display a specific session (or group of sessions).
	<b>session-id</b> <i>session-id</i>	(Optional) Specify an authentication manager session.
	<b>handle</b> <i>handle</i>	(Optional) Specify a range from 1 to 4294967295.
	<b>mac</b> <i>mac</i>	(Optional) Display authentication manager information for a specified MAC address.

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

**Command Modes** Privileged EXEC and User EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(50)SE	This command was introduced.

**Usage Guidelines** [Table 2-17](#) describes the significant fields shown in the output of the **show authentication** command.



## Note

The possible values for the status of sessions are shown below. For a session in terminal state, *Authz Success* or *Authz Failed* is displayed along with *No methods* if no method has provided a result.

**Table 2-17** *show authentication Command Output*

Field	Description
Idle	The session has been initialized and no methods have run yet.
Running	A method is running for this session.
No methods	No method has provided a result for this session.

**Table 2-17** *show authentication Command Output (continued)*

Field	Description
Authc Success	A method has resulted in authentication success for this session.
Authc Failed	A method has resulted in authentication fail for this session.
Authz Success	All features have been successfully applied for this session.
Authz Failed	A feature has failed to be applied for this session.

**Table 2-18** lists the possible values for the state of methods. For a session in a terminal state, *Authc Success*, *Authc Failed*, or *Failed over* are displayed. *Failed over* means that an authentication method ran and then failed over to the next method, which did not provide a result. *Not run* appears for sessions that synchronized on standby.

**Table 2-18** *State Method Values*

Method State	State Level	Description
Not run	Terminal	The method has not run for this session.
Running	Intermediate	The method is running for this session.
Failed over	Terminal	The method has failed and the next method is expected to provide a result.
Authc Success	Terminal	The method has provided a successful authentication result for the session.
Authc Failed	Terminal	The method has provided a failed authentication result for the session.

## Examples

This is an example the **show authentication registrations** command:

```
Switch# show authentication registrations
Auth Methods registered with the Auth Manager:
Handle Priority Name
3 0 dot1x
2 1 mab
1 2 webauth
```

The is an example of the **show authentication interface interface-id** command:

```
Switch# show authentication interface gigabitethernet1/23
Client list:
MAC Address Domain Status Handle Interface
000e.84af.59bd DATA Authz Success 0xE0000000 GigabitEthernet1/0/23
Available methods list:
Handle Priority Name
3 0 dot1x
Runnable methods list:
Handle Priority Name
3 0 dot1x
```

This is an example of the **show authentication sessions** command:

```
Switch# show authentication sessions
Interface  MAC Address      Method  Domain  Status      Session ID
Gi3/45     (unknown)        N/A     DATA   Authz Failed 0908140400000007003651EC
Gi3/46     (unknown)        N/A     DATA   Authz Success 09081404000000080057C274
```

This is an example of the **show authentication sessions** command for a specified interface:

```
Switch# show authentication sessions int gi 3/46
      Interface: GigabitEthernet3/46
      MAC Address: Unknown
      IP Address: Unknown
      Status: Authz Success
      Domain: DATA
      Oper host mode: multi-host
      Oper control dir: both
      Authorized By: Guest Vlan
      Vlan Policy: 4094
      Session timeout: N/A
      Idle timeout: N/A
      Common Session ID: 09081404000000080057C274
      Acct Session ID: 0x0000000A
      Handle: 0xCC000008
Runnable methods list:
  Method  State
  dot1x   Failed over
```

This is an example of the **show authentication sessions** command for a specified MAC address:

```
Switch# show authentication sessions mac 000e.84af.59bd
Interface: GigabitEthernet1/23
MAC Address: 000e.84af.59bd
Status: Authz Success
Domain: DATA
Oper host mode: single-host
Authorized By: Authentication Server
Vlan Policy: 10
Handle: 0xE0000000
Runnable methods list:
Method State
dot1x Authc Success
```

This is an example of the **show authentication session method** command for a specified method:

```
Switch# show authentication sessions method mab
No Auth Manager contexts match supplied criteria
Switch# show authentication sessions method dot1x
MAC Address Domain Status Handle Interface
000e.84af.59bd DATA Authz Success 0xE0000000 GigabitEthernet1/23
```

Related Commands	Command	Description
	<a href="#">authentication event</a>	Sets the action for specific authentication events.
	<a href="#">authentication fallback</a>	Configures a port to use web authentication as a fallback method for clients that do not support IEEE 802.1x authentication.
	<a href="#">authentication host-mode</a>	Sets the authorization manager mode on a port.
	<a href="#">authentication open</a>	Enables or disables open access on a port.
	<a href="#">authentication order</a>	Sets the order of authentication methods used on a port.
	<a href="#">authentication periodic</a>	Enable or disables reauthentication on a port.
	<a href="#">authentication port-control</a>	Enables manual control of the port authorization state.

<b>authentication priority</b>	Adds an authentication method to the port-priority list.
<b>authentication timer</b>	Configures the timeout and reauthentication parameters for an 802.1x-enabled port.
<b>authentication violation</b>	Configures the violation modes that occur when a new device connects to a port or when a new device connects to a port with the maximum number of devices already connected to that port.

# show auto qos

Use the **show auto qos** user EXEC command to display the quality of service (QoS) commands entered on the interfaces on which automatic QoS (auto-QoS) is enabled.

**show auto qos** [**interface** *interface-id*]

<b>Syntax Description</b>	<b>interface</b> <i>interface-id</i>	(Optional) Display auto-QoS information for the specified port or for all ports. Valid interfaces include physical ports.
---------------------------	--------------------------------------	---

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** The **show auto qos** command output shows only the auto-QoS command entered on each interface. The **show auto qos interface** *interface-id* command output shows the auto-QoS command entered on a specific interface.

Use the **show running-config** privileged EXEC command to display the auto-QoS configuration and the user modifications.

To display information about the QoS configuration that might be affected by auto-QoS, use one of these commands:

- **show mls qos**
- **show mls qos maps cos-dscp**
- **show mls qos interface** *interface-id* [**buffers** | **queueing**]
- **show mls qos maps** [**cos-dscp** | **cos-input-q** | **cos-output-q** | **dscp-cos** | **dscp-input-q** | **dscp-output-q**]
- **show mls qos input-queue**
- **show running-config**

**Examples** This is an example of output from the **show auto qos** command after the **auto qos voip cisco-phone** and the **auto qos voip cisco-softphone** interface configuration commands are entered:

```
Switch> show auto qos
GigabitEthernet0/4
auto qos voip cisco-softphone

GigabitEthernet0/5
auto qos voip cisco-phone

GigabitEthernet0/6
auto qos voip cisco-phone
```

## show auto qos

This is an example of output from the **show auto qos interface interface-id** command when the **auto qos voip cisco-phone** interface configuration command is entered:

```
Switch> show auto qos interface gigabitethernet 0/5
GigabitEthernet0/5
auto qos voip cisco-phone
```

This is an example of output from the **show running-config** privileged EXEC command when the **auto qos voip cisco-phone** and the **auto qos voip cisco-softphone** interface configuration commands are entered:

```
Switch# show running-config
Building configuration...

...
mls qos map policed-dscp 24 26 46 to 0
mls qos map cos-dscp 0 8 16 26 32 46 48 56
mls qos srr-queue input bandwidth 90 10
mls qos srr-queue input threshold 1 8 16
mls qos srr-queue input threshold 2 34 66
mls qos srr-queue input buffers 67 33
mls qos srr-queue input cos-map queue 1 threshold 2 1
mls qos srr-queue input cos-map queue 1 threshold 3 0
mls qos srr-queue input cos-map queue 2 threshold 1 2
mls qos srr-queue input cos-map queue 2 threshold 2 4 6 7
mls qos srr-queue input cos-map queue 2 threshold 3 3 5
mls qos srr-queue input dscp-map queue 1 threshold 2 9 10 11 12 13 14 15
mls qos srr-queue input dscp-map queue 1 threshold 3 0 1 2 3 4 5 6 7
mls qos srr-queue input dscp-map queue 1 threshold 3 32
mls qos srr-queue input dscp-map queue 2 threshold 1 16 17 18 19 20 21 22 23
mls qos srr-queue input dscp-map queue 2 threshold 2 33 34 35 36 37 38 39 48
mls qos srr-queue input dscp-map queue 2 threshold 2 49 50 51 52 53 54 55 56
mls qos srr-queue input dscp-map queue 2 threshold 2 57 58 59 60 61 62 63
mls qos srr-queue input dscp-map queue 2 threshold 3 24 25 26 27 28 29 30 31
mls qos srr-queue input dscp-map queue 2 threshold 3 40 41 42 43 44 45 46 47
mls qos srr-queue output cos-map queue 1 threshold 3 5
mls qos srr-queue output cos-map queue 2 threshold 3 3 6 7
mls qos srr-queue output cos-map queue 3 threshold 3 2 4
mls qos srr-queue output cos-map queue 4 threshold 2 1
mls qos srr-queue output cos-map queue 4 threshold 3 0
mls qos srr-queue output dscp-map queue 1 threshold 3 40 41 42 43 44 45 46 47
mls qos srr-queue output dscp-map queue 2 threshold 3 24 25 26 27 28 29 30 31
mls qos srr-queue output dscp-map queue 2 threshold 3 48 49 50 51 52 53 54 55
mls qos srr-queue output dscp-map queue 2 threshold 3 56 57 58 59 60 61 62 63
mls qos srr-queue output dscp-map queue 3 threshold 3 16 17 18 19 20 21 22 23
mls qos srr-queue output dscp-map queue 3 threshold 3 32 33 34 35 36 37 38 39
mls qos srr-queue output dscp-map queue 4 threshold 1 8
mls qos srr-queue output dscp-map queue 4 threshold 2 9 10 11 12 13 14 15
mls qos srr-queue output dscp-map queue 4 threshold 3 0 1 2 3 4 5 6 7
mls qos queue-set output 1 threshold 1 100 100 100 100
mls qos queue-set output 1 threshold 2 75 75 75 250
mls qos queue-set output 1 threshold 3 75 150 100 300
mls qos queue-set output 1 threshold 4 50 100 75 400
mls qos queue-set output 2 threshold 1 100 100 100 100
mls qos queue-set output 2 threshold 2 35 35 35 35
mls qos queue-set output 2 threshold 3 55 82 100 182
mls qos queue-set output 2 threshold 4 90 250 100 400
mls qos queue-set output 1 buffers 15 20 20 45
mls qos queue-set output 2 buffers 24 20 26 30
mls qos
...
!
```

```
class-map match-all AutoQoS-VoIP-RTP-Trust
match ip dscp ef
```



```

class-map match-all AutoQoS-VoIP-Control-Trust
  match ip dscp cs3 af31
!
policy-map AutoQoS-Police-SoftPhone
  class AutoQoS-VoIP-RTP-Trust
    set dscp ef
    police 320000 8000 exceed-action policed-dscp-transmit
  class AutoQoS-VoIP-Control-Trust
    set dscp cs3
    police 32000 8000 exceed-action policed-dscp-transmit
!
...
!
interface GigabitEthernet0/4
  switchport mode access
  switchport port-security maximum 400
  service-policy input AutoQoS-Police-SoftPhone
  speed 100
  duplex half
  srr-queue bandwidth share 10 10 60 20
  srr-queue bandwidth shape 10 0 0 0
  auto qos voip cisco-softphone
!
interface GigabitEthernet0/5
  switchport mode access
  switchport port-security maximum 1999
  speed 100
  duplex full
  srr-queue bandwidth share 10 10 60 20
  srr-queue bandwidth shape 10 0 0 0
  mls qos trust device cisco-phone
  mls qos trust cos
  auto qos voip cisco-phone
!
interface GigabitEthernet0/6
  switchport trunk encapsulation dot1q
  switchport trunk native vlan 2
  switchport mode access
  speed 10
  srr-queue bandwidth share 10 10 60 20
  srr-queue bandwidth shape 10 0 0 0
  mls qos trust device cisco-phone
  mls qos trust cos
  auto qos voip cisco-phone
!
<output truncated>

```

This is an example of output from the **show auto qos interface *interface-id*** command when the **auto qos voip cisco-phone** interface configuration command is entered:

```

Switch> show auto qos interface fastethernet
Fastethernet auto qos voip cisco-softphone

```

These are examples of output from the **show auto qos** command when auto-QoS is disabled on the switch:

```

Switch> show auto qos
AutoQoS not enabled on any interface

```

These are examples of output from the **show auto qos interface *interface-id*** command when auto-QoS is disabled on an interface:

```
Switch> show auto qos interface gigabitethernet0/1
AutoQoS is disabled
```

Related Commands

Command	Description
<a href="#">auto qos voip</a>	Automatically configures QoS for VoIP within a QoS domain.
<a href="#">debug auto qos</a>	Enables debugging of the auto-QoS feature.

# show boot

Use the **show boot** privileged EXEC command to display the settings of the boot environment variables.

**show boot** [ | { **begin** | **exclude** | **include** } *expression*]

Syntax Description	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	Privileged EXEC
---------------	-----------------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> are not displayed, but the lines that contain <i>Output</i> are displayed.
------------------	---

Examples	This is an example of output from the <b>show boot</b> command. <a href="#">Table 2-19</a> describes each field in the display.
----------	---

```
Switch# show boot
BOOT path-list: flash:cbs30x0-lanbase-mz-122.25.SEF2/cbs30x0-lanbase-mz-122.25.SEF2.bin
Config file:      flash:/config.text
Private Config file: flash:/private-config
Enable Break:     no
Manual Boot:      yes
HELPER path-list:
NVRAM/Config file
    buffer size:  32768
```

**Table 2-19**      *show boot Field Descriptions*

Field	Description
BOOT path-list	<p>Displays a semicolon separated list of executable files to try to load and execute when automatically booting up.</p> <p>If the BOOT environment variable is not set, the system attempts to load and execute the first executable image it can find by using a recursive, depth-first search through the flash file system. In a depth-first search of a directory, each encountered subdirectory is completely searched before continuing the search in the original directory.</p> <p>If the BOOT variable is set but the specified images cannot be loaded, the system attempts to boot the first bootable file that it can find in the flash file system.</p>
Config file	Displays the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration.
Private Config file	Displays the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration.
Enable Break	Displays whether a break during booting up is enabled or disabled. If it is set to yes, on, or 1, you can interrupt the automatic bootup process by pressing the Break key on the console after the flash file system is initialized.
Manual Boot	Displays whether the switch automatically or manually boots up. If it is set to no or 0, the bootloader attempts to automatically boot up the system. If it is set to anything else, you must manually boot up the switch from the bootloader mode.
Helper path-list	Displays a semicolon separated list of loadable files to dynamically load during the bootloader initialization. Helper files extend or patch the functionality of the bootloader.
NVRAM/Config file buffer size	Displays the buffer size that Cisco IOS uses to hold a copy of the configuration file in memory. The configuration file cannot be larger than the buffer size allocation.

Related Commands	Command	Description
	<b>boot config-file</b>	Specifies the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration.
	<b>boot enable-break</b>	Enables interrupting the automatic bootup process.
	<b>boot manual</b>	Enables manually booting up the switch during the next bootup cycle.
	<b>boot private-config-file</b>	Specifies the filename that Cisco IOS uses to read and write a nonvolatile copy of the private configuration.
	<b>boot system</b>	Specifies the Cisco IOS image to load during the next bootup cycle.

# show cisp

Use the **show cisp** privileged EXEC command to display CISP information for a specified interface.

**show cisp** {[**interface** *interface-id*] | **clients** | **summary**} | {[**begin** | **exclude** | **include**] *expression*}

Syntax Description	
<b>clients</b>	(Optional) Display CISP client details
<b>interface</b> <i>interface-id</i>	(Optional) Display CISP information about the specified interface. Valid interfaces include physical ports and port channels.
<b>summary</b>	(Optional) Display
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	Global configuration
---------------	----------------------

Command History	Release	Modification
	12.2(50)SE	This command was introduced.

**Examples** This example shows output from the **show cisp interface** command:

```
WS-C3750E-48TD#show cisp interface fast 0
CISP not enabled on specified interface
```

This example shows output from the **show cisp summary** command:

```
CISP is not running on any interface
```

Related Commands	Command	Description
	<b>dot1x credentials</b> <i>profile</i>	Configure a profile on a supplicant switch
	<b>cisp enable</b>	Enable Client Information Signalling Protocol (CISP)

# show class-map

Use the **show class-map** user EXEC command to display quality of service (QoS) class maps, which define the match criteria to classify traffic.

```
show class-map [class-map-name] [ | { begin | exclude | include } expression]
```

Syntax Description	<i>class-map-name</i>	(Optional) Display the contents of the specified class map.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> are not displayed, but the lines that contain <i>Output</i> are displayed.
------------------	---

**Examples** This is an example of output from the **show class-map** command:

```
Switch> show class-map
Class Map match-all videowizard_10-10-10-10 (id 2)
  Match access-group name videowizard_10-10-10-10

Class Map match-any class-default (id 0)
  Match any
Class Map match-all dscp5 (id 3)
  Match ip dscp 5
```

Related Commands	<b>Command</b>	<b>Description</b>
	<a href="#">class-map</a>	Creates a class map to be used for matching packets to the class whose name you specify.
	<a href="#">match (class-map configuration)</a>	Defines the match criteria to classify traffic.

# show controllers cpu-interface

Use the **show controllers cpu-interface** privileged EXEC command to display the state of the CPU network interface ASIC and the send and receive statistics for packets reaching the CPU.

**show controllers cpu-interface** [ | {**begin** | **exclude** | **include**} *expression*]

<b>Syntax Description</b>	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

**Command Modes** Privileged EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** This display provides information that might be useful for Cisco technical support representatives troubleshooting the switch.

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** This is a partial output example from the **show controllers cpu-interface** command:

```
Switch# show controllers cpu-interface
cpu-queue-frames  retrieved  dropped    invalid    hol-block
-----
rpc               4523063    0          0           0
stp              1545035    0          0           0
ipc              1903047    0          0           0
routing protocol  96145      0          0           0
L2 protocol      79596      0          0           0
remote console   0          0          0           0
sw forwarding    5756       0          0           0
host             225646     0          0           0
broadcast        46472      0          0           0
cbt-to-spt       0          0          0           0
igmp snooping    68411      0          0           0
icmp             0          0          0           0
logging          0          0          0           0
rpf-fail         0          0          0           0
queue14          0          0          0           0
cpu heartbeat    1710501    0          0           0
```

Supervisor ASIC receive-queue parameters

```
-----
queue 0 maxrecevsize 5EE pakhead 1419A20 paktail 13EAED4
queue 1 maxrecevsize 5EE pakhead 15828E0 paktail 157FBFC
```

## show controllers cpu-interface

```
queue 2 maxrecevsize 5EE pakhead 1470D40 paktail 1470FE4
queue 3 maxrecevsize 5EE pakhead 19CDDD0 paktail 19D02C8
```

<output truncated>

### Supervisor ASIC Mic Registers

```
-----
MicDirectPollInfo          80000800
MicIndicationsReceived     00000000
MicInterruptsReceived      00000000
MicPcsInfo                 0001001F
MicPlbMasterConfiguration  00000000
MicRxFifosAvailable        00000000
MicRxFifosReady            0000BFFF
MicTimeOutPeriod:         FrameTOPeriod: 00000EA6 DirectTOPeriod: 00004000
```

<output truncated>

### MicTransmitFifoInfo:

```
Fifo0:  StartPtrs:      038C2800      ReadPtr:      038C2C38
        WritePtrs:      038C2C38      Fifo_Flag:      8A800800
        Weights:        001E001E
Fifo1:  StartPtr:       03A9BC00      ReadPtr:       03A9BC60
        WritePtrs:      03A9BC60      Fifo_Flag:      89800400
        writeHeaderPtr: 03A9BC60
Fifo2:  StartPtr:       038C8800      ReadPtr:       038C88E0
        WritePtrs:      038C88E0      Fifo_Flag:      88800200
        writeHeaderPtr: 038C88E0
Fifo3:  StartPtr:       03C30400      ReadPtr:       03C30638
        WritePtrs:      03C30638      Fifo_Flag:      89800400
        writeHeaderPtr: 03C30638
Fifo4:  StartPtr:       03AD5000      ReadPtr:       03AD50A0
        WritePtrs:      03AD50A0      Fifo_Flag:      89800400
        writeHeaderPtr: 03AD50A0
Fifo5:  StartPtr:       03A7A600      ReadPtr:       03A7A600
        WritePtrs:      03A7A600      Fifo_Flag:      88800200
        writeHeaderPtr: 03A7A600
Fifo6:  StartPtr:       03BF8400      ReadPtr:       03BF87F0
        WritePtrs:      03BF87F0      Fifo_Flag:      89800400
```

<output truncated>

## Related Commands

Command	Description
<a href="#">show controllers ethernet-controller</a>	Displays per-interface send and receive statistics read from the hardware or the interface internal registers.
<a href="#">show interfaces</a>	Displays the administrative and operational status of all interfaces or a specified interface.



# show controllers ethernet-controller

Use the **show controllers ethernet-controller** privileged EXEC command without keywords to display per-interface send and receive statistics read from the hardware. Use with the **phy** keyword to display the interface internal registers or the **port-asic** keyword to display information about the port ASIC.

**show controllers ethernet-controller** [*interface-id*] [**phy** [**detail**]] [**port-asic** {**configuration** | **statistics**}] [ | {**begin** | **exclude** | **include**} *expression*]

Syntax Description	
<i>interface-id</i>	The physical interface (including type, module, and port number).
<b>phy</b>	(Optional) Display the status of the internal registers on the switch physical layer device (PHY) for the device or the interface. This display includes the operational state of the automatic medium-dependent interface crossover (auto-MDIX) feature on an interface.
<b>detail</b>	(Optional) Display details about the PHY internal registers.
<b>port-asic</b>	(Optional) Display information about the port ASIC internal registers.
<b>configuration</b>	Display port ASIC internal register configuration.
<b>statistics</b>	Display port ASIC statistics, including the Rx/Sup Queue and miscellaneous statistics.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

**Command Modes** Privileged EXEC (only supported with the *interface-id* keywords in user EXEC mode)

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** This display without keywords provides traffic statistics, basically the RMON statistics for all interfaces or for the specified interface.

When you enter the **phy** or **port-asic** keywords, the displayed information is useful primarily for Cisco technical support representatives troubleshooting the switch.

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**

This is an example of output from the **show controllers ethernet-controller** command for an interface. [Table 2-20](#) describes the *Transmit* fields, and [Table 2-21](#) describes the *Receive* fields.

```
Switch# show controllers ethernet-controller gigabitethernet0/1
Transmit GigabitEthernet0/1          Receive
0 Bytes                                0 Bytes
0 Unicast frames                      0 Unicast frames
0 Multicast frames                    0 Multicast frames
0 Broadcast frames                    0 Broadcast frames
0 Too old frames                      0 Unicast bytes
0 Deferred frames                    0 Multicast bytes
0 MTU exceeded frames                 0 Broadcast bytes
0 1 collision frames                  0 Alignment errors
0 2 collision frames                  0 FCS errors
0 3 collision frames                  0 Oversize frames
0 4 collision frames                  0 Undersize frames
0 5 collision frames                  0 Collision fragments
0 6 collision frames
0 7 collision frames                  0 Minimum size frames
0 8 collision frames                  0 65 to 127 byte frames
0 9 collision frames                  0 128 to 255 byte frames
0 10 collision frames                 0 256 to 511 byte frames
0 11 collision frames                 0 512 to 1023 byte frames
0 12 collision frames                 0 1024 to 1518 byte frames
0 13 collision frames                 0 Overrun frames
0 14 collision frames                 0 Pause frames
0 15 collision frames                 0 Symbol error frames
0 Excessive collisions
0 Late collisions                    0 Invalid frames, too large
0 VLAN discard frames                0 Valid frames, too large
0 Excess defer frames                 0 Invalid frames, too small
0 64 byte frames                     0 Valid frames, too small
0 127 byte frames
0 255 byte frames                    0 Too old frames
0 511 byte frames                    0 Valid oversize frames
0 1023 byte frames                   0 System FCS error frames
0 1518 byte frames                   0 RxPortFifoFull drop frame
0 Too large frames
0 Good (1 coll) frames
```

**Table 2-20** Transmit Field Descriptions

Field	Description
Bytes	The total number of bytes sent on an interface.
Unicast Frames	The total number of frames sent to unicast addresses.
Multicast frames	The total number of frames sent to multicast addresses.
Broadcast frames	The total number of frames sent to broadcast addresses.
Too old frames	The number of frames dropped on the egress port because the packet aged out.
Deferred frames	The number of frames that are not sent after the time exceeds 2*maximum-packet time.
MTU exceeded frames	The number of frames that are larger than the maximum allowed frame size.
1 collision frames	The number of frames that are successfully sent on an interface after one collision occurs.
2 collision frames	The number of frames that are successfully sent on an interface after two collisions occur.
3 collision frames	The number of frames that are successfully sent on an interface after three collisions occur.
4 collision frames	The number of frames that are successfully sent on an interface after four collisions occur.

**Table 2-20** *Transmit Field Descriptions (continued)*

Field	Description
5 collision frames	The number of frames that are successfully sent on an interface after five collisions occur.
6 collision frames	The number of frames that are successfully sent on an interface after six collisions occur.
7 collision frames	The number of frames that are successfully sent on an interface after seven collisions occur.
8 collision frames	The number of frames that are successfully sent on an interface after eight collisions occur.
9 collision frames	The number of frames that are successfully sent on an interface after nine collisions occur.
10 collision frames	The number of frames that are successfully sent on an interface after ten collisions occur.
11 collision frames	The number of frames that are successfully sent on an interface after 11 collisions occur.
12 collision frames	The number of frames that are successfully sent on an interface after 12 collisions occur.
13 collision frames	The number of frames that are successfully sent on an interface after 13 collisions occur.
14 collision frames	The number of frames that are successfully sent on an interface after 14 collisions occur.
15 collision frames	The number of frames that are successfully sent on an interface after 15 collisions occur.
Excessive collisions	The number of frames that could not be sent on an interface after 16 collisions occur.
Late collisions	After a frame is sent, the number of frames dropped because late collisions were detected while the frame was sent.
VLAN discard frames	The number of frames dropped on an interface because the CFI <sup>1</sup> bit is set.
Excess defer frames	The number of frames that are not sent after the time exceeds the maximum-packet time.
64 byte frames	The total number of frames sent on an interface that are 64 bytes.
127 byte frames	The total number of frames sent on an interface that are from 65 to 127 bytes.
255 byte frames	The total number of frames sent on an interface that are from 128 to 255 bytes.
511 byte frames	The total number of frames sent on an interface that are from 256 to 511 bytes.
1023 byte frames	The total number of frames sent on an interface that are from 512 to 1023 bytes.
1518 byte frames	The total number of frames sent on an interface that are from 1024 to 1518 bytes.
Too large frames	The number of frames sent on an interface that are larger than the maximum allowed frame size.
Good (1 coll) frames	The number of frames that are successfully sent on an interface after one collision occurs. This value does not include the number of frames that are not successfully sent after one collision occurs.

1. CFI = Canonical Format Indicator

**Table 2-21** *Receive Field Descriptions*

Field	Description
Bytes	The total amount of memory (in bytes) used by frames received on an interface, including the FCS <sup>1</sup> value and the incorrectly formed frames. This value excludes the frame header bits.
Unicast frames	The total number of frames successfully received on the interface that are directed to unicast addresses.
Multicast frames	The total number of frames successfully received on the interface that are directed to multicast addresses.
Broadcast frames	The total number of frames successfully received on an interface that are directed to broadcast addresses.

**Table 2-21**      **Receive Field Descriptions (continued)**

Field	Description
Unicast bytes	The total amount of memory (in bytes) used by unicast frames received on an interface, including the FCS value and the incorrectly formed frames. This value excludes the frame header bits.
Multicast bytes	The total amount of memory (in bytes) used by multicast frames received on an interface, including the FCS value and the incorrectly formed frames. This value excludes the frame header bits.
Broadcast bytes	The total amount of memory (in bytes) used by broadcast frames received on an interface, including the FCS value and the incorrectly formed frames. This value excludes the frame header bits.
Alignment errors	The total number of frames received on an interface that have alignment errors.
FCS errors	The total number of frames received on an interface that have a valid length (in bytes) but do not have the correct FCS values.
Oversize frames	The number of frames received on an interface that are larger than the maximum allowed frame size.
Undersize frames	The number of frames received on an interface that are smaller than 64 bytes.
Collision fragments	The number of collision fragments received on an interface.
Minimum size frames	The total number of frames that are the minimum frame size.
65 to 127 byte frames	The total number of frames that are from 65 to 127 bytes.
128 to 255 byte frames	The total number of frames that are from 128 to 255 bytes.
256 to 511 byte frames	The total number of frames that are from 256 to 511 bytes.
512 to 1023 byte frames	The total number of frames that are from 512 to 1023 bytes.
1024 to 1518 byte frames	The total number of frames that are from 1024 to 1518 bytes.
Overrun frames	The total number of overrun frames received on an interface.
Pause frames	The number of pause frames received on an interface.
Symbol error frames	The number of frames received on an interface that have symbol errors.
Invalid frames, too large	The number of frames received that were larger than maximum allowed MTU <sup>2</sup> size (including the FCS bits and excluding the frame header) and that have either an FCS error or an alignment error.
Valid frames, too large	The number of frames received on an interface that are larger than the maximum allowed frame size.
Invalid frames, too small	The number of frames received that are smaller than 64 bytes (including the FCS bits and excluding the frame header) and that have either an FCS error or an alignment error.
Valid frames, too small	The number of frames received on an interface that are smaller than 64 bytes (or 68 bytes for VLAN-tagged frames) and that have valid FCS values. The frame size includes the FCS bits but excludes the frame header bits.
Too old frames	The number of frames dropped on the ingress port because the packet aged out.
Valid oversize frames	The number of frames received on an interface that are larger than the maximum allowed frame size and have valid FCS values. The frame size includes the FCS value but does not include the VLAN tag.

**Table 2-21**      *Receive Field Descriptions (continued)*

Field	Description
System FCS error frames	The total number of frames received on an interface that have a valid length (in bytes) but that do not have the correct FCS values.
RxPortFifoFull drop frames	The total number of frames received on an interface that are dropped because the ingress queue is full.

1. FCS = frame check sequence
2. MTU = maximum transmission unit

This is an example of output from the **show controllers ethernet-controller phy** command for a specific interface:

```
Switch# show controllers ethernet-controller gigabitethernet0/2 phy
Control Register          : 0001 0001 0100 0000
Control STATUS           : 0111 1001 0100 1001
Phy ID 1                  : 0000 0001 0100 0001
Phy ID 2                  : 0000 1100 0010 0100
Auto-Negotiation Advertisement : 0000 0011 1110 0001
Auto-Negotiation Link Partner : 0000 0000 0000 0000
Auto-Negotiation Expansion Reg : 0000 0000 0000 0100
Next Page Transmit Register : 0010 0000 0000 0001
Link Partner Next page Register : 0000 0000 0000 0000
1000BASE-T Control Register : 0000 1111 0000 0000
1000BASE-T Status Register  : 0100 0000 0000 0000
Extended Status Register   : 0011 0000 0000 0000
PHY Specific Control Register : 0000 0000 0111 1000
PHY Specific Status Register : 1000 0001 0100 0000
Interrupt Enable           : 0000 0000 0000 0000
Interrupt Status          : 0000 0000 0100 0000
Extended PHY Specific Control : 0000 1100 0110 1000
Receive Error Counter      : 0000 0000 0000 0000
Reserved Register 1       : 0000 0000 0000 0000
Global Status             : 0000 0000 0000 0000
LED Control               : 0100 0001 0000 0000
Manual LED Override       : 0000 1000 0010 1010
Extended PHY Specific Control : 0000 0000 0001 1010
Disable Receiver 1        : 0000 0000 0000 1011
Disable Receiver 2        : 1000 0000 0000 0100
Extended PHY Specific Status : 1000 0100 1000 0000
Auto-MDIX                 : On   [AdminState=1   Flags=0x00052248]
```

This is an example of output from the **show controllers ethernet-controller port-asic configuration** command:

```
Switch# show controllers ethernet-controller port-asic configuration
=====
Switch 1, PortASIC 0 Registers
-----
DeviceType          : 000101BC
Reset               : 00000000
PmadMicConfig       : 00000001
PmadMicDiag         : 00000003
SupervisorReceiveFifoSramInfo : 000007D0 000007D0 40000000
SupervisorTransmitFifoSramInfo : 000001D0 000001D0 40000000
GlobalStatus        : 00000800
IndicationStatus    : 00000000
IndicationStatusMask : FFFFFFFF
InterruptStatus     : 00000000
InterruptStatusMask : 01FFE800
```

# show controllers ethernet-controller

```

SupervisorDiag                : 00000000
SupervisorFrameSizeLimit      : 000007C8
SupervisorBroadcast           : 000A0F01
GeneralIO                     : 000003F9 00000000 00000004
StackPcsInfo                   : FFFF1000 860329BD 5555FFFF FFFFFFFF
                               FF0FFF00 86020000 5555FFFF 00000000
StackRacInfo                   : 73001630 00000003 7F001644 00000003
                               24140003 FD632B00 18E418E0 FFFFFFFF

StackControlStatus            : 18E418E0
stackControlStatusMask        : FFFFFFFF
TransmitBufferFreeListInfo     : 00000854 00000800 00000FF8 00000000
                               0000088A 0000085D 00000FF8 00000000
TransmitRingFifoInfo           : 00000016 00000016 40000000 00000000
                               0000000C 0000000C 40000000 00000000
TransmitBufferInfo             : 00012000 00000FFF 00000000 00000030
TransmitBufferCommonCount      : 00000F7A
TransmitBufferCommonCountPeak : 0000001E
TransmitBufferCommonCommonEmpty : 000000FF
NetworkActivity                : 00000000 00000000 00000000 02400000
DroppedStatistics              : 00000000
FrameLengthDeltaSelect         : 00000001
SneakPortFifoInfo              : 00000000
MacInfo                        : 0EC0801C 00000001 0EC0801B 00000001
                               00C0001D 00000001 00C0001E 00000001

```

<output truncated>

This is an example of output from the **show controllers ethernet-controller port-asic statistics** command:

```

Switch# show controllers ethernet-controller port-asic statistics
=====
Switch 1, PortASIC 0 Statistics
-----
      0 RxQ-0, wt-0 enqueue frames      0 RxQ-0, wt-0 drop frames
4118966 RxQ-0, wt-1 enqueue frames      0 RxQ-0, wt-1 drop frames
      0 RxQ-0, wt-2 enqueue frames      0 RxQ-0, wt-2 drop frames

      0 RxQ-1, wt-0 enqueue frames      0 RxQ-1, wt-0 drop frames
296 RxQ-1, wt-1 enqueue frames          0 RxQ-1, wt-1 drop frames
2836036 RxQ-1, wt-2 enqueue frames      0 RxQ-1, wt-2 drop frames

      0 RxQ-2, wt-0 enqueue frames      0 RxQ-2, wt-0 drop frames
      0 RxQ-2, wt-1 enqueue frames      0 RxQ-2, wt-1 drop frames
158377 RxQ-2, wt-2 enqueue frames       0 RxQ-2, wt-2 drop frames

      0 RxQ-3, wt-0 enqueue frames      0 RxQ-3, wt-0 drop frames
      0 RxQ-3, wt-1 enqueue frames      0 RxQ-3, wt-1 drop frames
      0 RxQ-3, wt-2 enqueue frames      0 RxQ-3, wt-2 drop frames

15 TxBufferFull Drop Count              0 Rx Fcs Error Frames
  0 TxBufferFrameDesc BadCrc16          0 Rx Invalid Oversize Frames
  0 TxBuffer Bandwidth Drop Cou         0 Rx Invalid Too Large Frames
  0 TxQueue Bandwidth Drop Coun         0 Rx Invalid Too Large Frames
  0 TxQueue Missed Drop Statist         0 Rx Invalid Too Small Frames
74 RxBuffer Drop DestIndex Cou         0 Rx Too Old Frames
  0 SneakQueue Drop Count               0 Tx Too Old Frames
  0 Learning Queue Overflow Fra         0 System Fcs Error Frames
  0 Learning Cam Skip Count

15 Sup Queue 0 Drop Frames              0 Sup Queue 8 Drop Frames
  0 Sup Queue 1 Drop Frames             0 Sup Queue 9 Drop Frames
  0 Sup Queue 2 Drop Frames             0 Sup Queue 10 Drop Frames

```

```

0 Sup Queue 3 Drop Frames
0 Sup Queue 4 Drop Frames
0 Sup Queue 5 Drop Frames
0 Sup Queue 6 Drop Frames
0 Sup Queue 7 Drop Frames
0 Sup Queue 11 Drop Frames
0 Sup Queue 12 Drop Frames
0 Sup Queue 13 Drop Frames
0 Sup Queue 14 Drop Frames
0 Sup Queue 15 Drop Frames
=====
Switch 1, PortASIC 1 Statistics
-----
0 RxQ-0, wt-0 enqueue frames
52 RxQ-0, wt-1 enqueue frames
0 RxQ-0, wt-2 enqueue frames
0 RxQ-0, wt-0 drop frames
0 RxQ-0, wt-1 drop frames
0 RxQ-0, wt-2 drop frames
<output truncated>

```

**Related Commands**

Command	Description
<a href="#">show controllers cpu-interface</a>	Displays the state of the CPU network ASIC and send and receive statistics for packets reaching the CPU.
<a href="#">show controllers team</a>	Displays the state of registers for all ternary content addressable memory (TCAM) in the system and for TCAM interface ASICs that are CAM controllers.
<a href="#">show idprom</a>	Displays the IDPROM information for the specified interface.

# show controllers tcam

Use the **show controllers tcam** privileged EXEC command to display the state of the registers for all ternary content addressable memory (TCAM) in the system and for all TCAM interface ASICs that are CAM controllers.

```
show controllers tcam [asic [number]] [detail] [ | {begin | exclude | include} expression]
```

Syntax Description	<b>asic</b>	(Optional) Display port ASIC TCAM information.
	<b>number</b>	(Optional) Display information for the specified port ASIC number. The range is from 0 to 15.
	<b>detail</b>	(Optional) Display detailed TCAM register information.
	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	Privileged EXEC
---------------	-----------------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

This display provides information that might be useful for Cisco technical support representatives troubleshooting the switch.

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

**Examples**

This is an example of output from the **show controllers tcam** command:

```
Switch# show controllers tcam
-----
TCAM-0 Registers
-----
REV:      00B30103
SIZE:     00080040
ID:       00000000
CCR:      00000000_F0000020

RPID0:    00000000_00000000
RPID1:    00000000_00000000
RPID2:    00000000_00000000
RPID3:    00000000_00000000

HRR0:     00000000_E000CAFC
HRR1:     00000000_00000000
HRR2:     00000000_00000000
```



```

HRR3:  00000000_00000000
HRR4:  00000000_00000000
HRR5:  00000000_00000000
HRR6:  00000000_00000000
HRR7:  00000000_00000000
<output truncated>

GMR31:  FF_FFFFFFFF_FFFFFFFF
GMR32:  FF_FFFFFFFF_FFFFFFFF
GMR33:  FF_FFFFFFFF_FFFFFFFF

=====
TCAM related PortASIC 1 registers
=====
LookupType:                89A1C67D_24E35F00
LastCamIndex:              0000FFE0
LocalNoMatch:              000069E0
ForwardingRamBaseAddress:
                           00022A00 0002FE00 00040600 0002FE00 0000D400
                           00000000 003FBA00 00009000 00009000 00040600
                           00000000 00012800 00012900

```

## Related Commands

Command	Description
<a href="#">show controllers cpu-interface</a>	Displays the state of the CPU network ASIC and send and receive statistics for packets reaching the CPU.
<a href="#">show controllers ethernet-controller</a>	Displays per-interface send and receive statistics read from the hardware or the interface internal registers.

# show controllers utilization

Use the **show controllers utilization** user EXEC command to display bandwidth utilization on the switch or specific ports.

```
show controllers [interface-id] utilization [ | {begin | exclude | include} expression]
```

Syntax Description	<i>interface-id</i>	(Optional) ID of the switch interface.
	<b>  begin</b>	(Optional) Display begins with the line that matches the specified <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the specified <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** Expressions are case sensitive. For example, if you enter **| exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

**Examples** This is an example of output from the **show controllers utilization** command.

```
Switch> show controllers utilization
Port          Receive Utilization  Transmit Utilization
Gi0/1          0                      0
Gi0/2          0                      0

<output truncated>

Switch Receive Bandwidth Percentage Utilization : 0
Switch Transmit Bandwidth Percentage Utilization : 0

Switch Fabric Percentage Utilization : 0
```

This is an example of output from the **show controllers utilization** command on a specific port:

```
Switch> show controllers gigabitethernet0/1 utilization
Receive Bandwidth Percentage Utilization : 0
Transmit Bandwidth Percentage Utilization : 0
```

Table 2-22 shows the field descriptions.

**Table 2-22** *show controllers utilization Field Descriptions*

Field	Description
Receive Bandwidth Percentage Utilization	Displays the received bandwidth usage of the switch, which is the sum of the received traffic on all the ports divided by the switch receive capacity.
Transmit Bandwidth Percentage Utilization	Displays the transmitted bandwidth usage of the switch, which is the sum of the transmitted traffic on all the ports divided it by the switch transmit capacity.
Fabric Percentage Utilization	Displays the average of the transmitted and received bandwidth usage of the switch.

**Related Commands**

Command	Description
<a href="#">show controllers ethernet-controller</a>	Displays the interface internal registers.

# show dot1q-tunnel

Use the **show dot1q-tunnel** user EXEC command to display information about IEEE 802.1Q tunnel ports.

**show dot1q-tunnel** [**interface** *interface-id*] [**|** { **begin** | **exclude** | **include** } *expression*]

## Syntax Description

<b>interface</b> <i>interface-id</i>	(Optional) Specify the interface for which to display IEEE 802.1Q tunneling information. Valid interfaces include physical ports and port channels.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)EA1	This command was introduced.

## Usage Guidelines

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

## Examples

These are examples of output from the **show dot1q-tunnel** command:

```
Switch> show dot1q-tunnel
dot1q-tunnel mode LAN Port(s)
-----
Gi0/1
Gi0/2
Gi0/3
Gi0/6
Po2
```

```
Switch> show dot1q-tunnel interface gigabitethernet0/1
dot1q-tunnel mode LAN Port(s)
-----
Gi1/0/1
```

## Related Commands

Command	Description
<b>show vlan dot1q tag native</b>	Displays IEEE 802.1Q native VLAN tagging status.
<b>switchport mode dot1q-tunnel</b>	Configures an interface as an IEEE 802.1Q tunnel port.

# show dot1x

Use the **show dot1x** user EXEC command to display IEEE 802.1x statistics, administrative status, and operational status for the switch or for the specified port.

```
show dot1x [{all [summary] | interface interface-id} [details | statistics]] [ | {begin | exclude | include} expression]
```

Syntax Description	<b>all [summary]</b>	(Optional) Display the IEEE 802.1x status for all ports.
	<b>interface interface-id</b>	(Optional) Display the IEEE 802.1x status for the specified port (including type, module, and port number).
	<b>details</b>	(Optional) Display the IEEE 802.1x interface details.
	<b>statistics</b>	(Optional) Display IEEE 802.1x statistics for the specified port.
	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** If you do not specify a port, global parameters and a summary appear. If you specify a port, details for that port appear.

If the port control is configured as unidirectional or bidirectional control and this setting conflicts with the switch configuration, the **show dot1x {all | interface interface-id}** privileged EXEC command output has this information:

```
ControlDirection          = In (Inactive)
```

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* appear.

**Examples** This is an example of output from the **show dot1x** user EXEC command:

```
Switch> show dot1x
Sysauthcontrol            Enabled
Dot1x Protocol Version    2
Critical Recovery Delay    100
Critical EAPOL             Disabled
```

This is an example of output from the **show dot1x all** user EXEC command:

```
Switch> show dot1x all
Sysauthcontrol           Enabled
Dot1x Protocol Version   2
Critical Recovery Delay   100
Critical EAPOL            Disabled

Dot1x Info for GigabitEthernet0/1
-----
PAE                       = AUTHENTICATOR
PortControl               = AUTO
ControlDirection          = Both
HostMode                  = SINGLE_HOST
ReAuthentication          = Disabled
QuietPeriod               = 60
ServerTimeout             = 30
SuppTimeout               = 30
ReAuthPeriod              = 3600 (Locally configured)
ReAuthMax                 = 2
MaxReq                    = 2
TxPeriod                  = 30
RateLimitPeriod           = 0

<output truncated>
```

This is an example of output from the **show dot1x all summary** user EXEC command:

Interface	PAE	Client	Status
Gi0/1	AUTH	none	UNAUTHORIZED
Gi0/2	AUTH	00a0.c9b8.0072	AUTHORIZED
Gi0/3	AUTH	none	UNAUTHORIZED

This is an example of output from the **show dot1x interface interface-id** user EXEC command:

```
Switch> show dot1x interface gigabitethernet0/2
Dot1x Info for GigabitEthernet0/2
-----
PAE                       = AUTHENTICATOR
PortControl               = AUTO
ControlDirection          = In
HostMode                  = SINGLE_HOST
ReAuthentication          = Disabled
QuietPeriod               = 60
ServerTimeout             = 30
SuppTimeout               = 30
ReAuthPeriod              = 3600 (Locally configured)
ReAuthMax                 = 2
MaxReq                    = 2
TxPeriod                  = 30
RateLimitPeriod           = 0
```

This is an example of output from the **show dot1x interface interface-id details** user EXEC command:

```
Switch# show dot1x interface gigabitethernet0/2 details
Dot1x Info for GigabitEthernet0/2
-----
PAE                       = AUTHENTICATOR
PortControl               = AUTO
ControlDirection          = Both
HostMode                  = SINGLE_HOST
ReAuthentication          = Disabled
QuietPeriod               = 60
ServerTimeout             = 30
```

```

SuppTimeout          = 30
ReAuthPeriod         = 3600 (Locally configured)
ReAuthMax            = 2
MaxReq               = 2
TxPeriod             = 30
RateLimitPeriod      = 0

```

```
Dot1x Authenticator Client List Empty
```

This is an example of output from the **show dot1x interface *interface-id* details** command when a port is assigned to a guest VLAN and the host mode changes to multiple-hosts mode:

```

Switch# show dot1x interface gigabitethernet0/1 details
Dot1x Info for GigabitEthernet0/1

```

```

-----
PAE                      = AUTHENTICATOR
PortControl              = AUTO
ControlDirection        = Both
HostMode                 = SINGLE_HOST
ReAuthentication         = Enabled
QuietPeriod              = 60
ServerTimeout            = 30
SuppTimeout              = 30
ReAuthPeriod             = 3600 (Locally configured)
ReAuthMax                = 2
MaxReq                   = 2
TxPeriod                 = 30
RateLimitPeriod          = 0
Guest-Vlan                = 182

```

```
Dot1x Authenticator Client List Empty
```

```

Port Status              = AUTHORIZED
Authorized By             = Guest-Vlan
Operational HostMode     = MULTI_HOST
Vlan Policy               = 182

```

This is an example of output from the **show dot1x interface *interface-id* statistics** command. [Table 2-23](#) describes the fields in the display.

```

Switch> show dot1x interface gigabitethernet0/2 statistics
Dot1x Authenticator Port Statistics for GigabitEthernet0/2
-----
RxStart = 0      RxLogoff = 0      RxResp = 1      RxRespID = 1
RxInvalid = 0    RxLenErr = 0      RxTotal = 2

TxReq = 2        TxReqID = 132    TxTotal = 134

RxVersion = 2    LastRxSrcMAC = 00a0.c9b8.0072

```

**Table 2-23** *show dot1x statistics Field Descriptions*

Field	Description
RxStart	Number of valid EAPOL-start frames that have been received.
RxLogoff	Number of EAPOL-logoff frames that have been received.
RxResp	Number of valid EAP-response frames (other than response/identity frames) that have been received.
RxRespID	Number of EAP-response/identity frames that have been received.

**Table 2-23** *show dot1x statistics Field Descriptions (continued)*

Field	Description
RxInvalid	Number of EAPOL frames that have been received and have an unrecognized frame type.
RxLenError	Number of EAPOL frames that have been received in which the packet body length field is invalid.
RxTotal	Number of valid EAPOL frames of any type that have been received.
TxReq	Number of EAP-request frames (other than request/identity frames) that have been sent.
TxReqId	Number of Extensible Authentication Protocol (EAP)-request/identity frames that have been sent.
TxTotal	Number of Extensible Authentication Protocol over LAN (EAPOL) frames of any type that have been sent.
RxVersion	Number of received packets in the IEEE 802.1x Version 1 format.
LastRxCsrcMac	Source MAC address carried in the most recently received EAPOL frame.

**Related Commands**

Command	Description
<a href="#">dot1x default</a>	Resets the IEEE 802.1x parameters to their default values.



# show dtp

Use the **show dtp** privileged EXEC command to display Dynamic Trunking Protocol (DTP) information for the switch or for a specified interface.

**show dtp** [**interface** *interface-id*] [ | {**begin** | **exclude** | **include**} *expression*]

## Syntax Description

<b>interface</b> <i>interface-id</i>	(Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, module, and port number).
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

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

This is an example of output from the **show dtp** command:

```
Switch# show dtp
Global DTP information
    Sending DTP Hello packets every 30 seconds
    Dynamic Trunk timeout is 300 seconds
    21 interfaces using DTP
```

This is an example of output from the **show dtp interface** command:

```
Switch# show dtp interface gigabitethernet0/1
DTP information for GigabitEthernet0/1:
TOS/TAS/TNS:                ACCESS/AUTO/ACCESS
TOT/TAT/TNT:                NATIVE/NEGOTIATE/NATIVE
Neighbor address 1:         000943A7D081
Neighbor address 2:         000000000000
Hello timer expiration (sec/state): 1/RUNNING
Access timer expiration (sec/state): never/STOPPED
Negotiation timer expiration (sec/state): never/STOPPED
Multidrop timer expiration (sec/state): never/STOPPED
FSM state:                  S2:ACCESS
# times multi & trunk       0
Enabled:                    yes
In STP:                     no
```

show dtp

```
Statistics
-----
3160 packets received (3160 good)
0 packets dropped
    0 nonegotiate, 0 bad version, 0 domain mismatches, 0 bad TLVs, 0 other
6320 packets output (6320 good)
    3160 native, 3160 software encap isl, 0 isl hardware native
0 output errors
0 trunk timeouts
1 link ups, last link up on Mon Mar 01 1993, 01:02:29
0 link downs
```

Related Commands	Command	Description
	<a href="#">show interfaces trunk</a>	Displays interface trunking information.

# show eap

Use the **show eap** privileged EXEC command to display Extensible Authentication Protocol (EAP) registration and session information for the switch or for the specified port.

```
show eap [{registrations [method [name] | transport [name]]} | {sessions [credentials name
[interface interface-id] | interface interface-id | method name | transport name]}]
[credentials name | interface interface-id | transport name] [ | {begin | exclude | include}
expression]
```

## Syntax Description

<b>registrations</b>	Display EAP registration information.
<b>method</b> <i>name</i>	(Optional) Display EAP method registration information.
<b>transport</b> <i>name</i>	(Optional) Display EAP transport registration information.
<b>sessions</b>	Display EAP session information.
<b>credentials</b> <i>name</i>	(Optional) Display EAP method registration information.
<b>interface</b> <i>interface-id</i>	(Optional) Display the EAP information for the specified port (including type, module, and port number).
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

When you use the **show eap registrations** privileged EXEC command with these keywords, the command output shows this information:

- **None**—All the lower levels used by EAP and the registered EAP methods.
- **method** *name* keyword—The specified method registrations.
- **transport** *name* keyword—The specific lower-level registrations.

When you use the **show eap sessions** privileged EXEC command with these keywords, the command output shows this information:

- **None**—All active EAP sessions.
- **credentials** *name* keyword—The specified credentials profile.
- **interface** *interface-id* keyword—The parameters for the specified interface.
- **method** *name* keyword—The specified EAP method.
- **transport** *name* keyword—The specified lower layer.

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* appear.

## Examples

This is an example of output from the **show eap registrations** privileged EXEC command:

```
Switch> show eap registrations
Registered EAP Methods:
  Method  Type      Name
    4      Peer      MD5

Registered EAP Lower Layers:
  Handle  Type      Name
    2      Authenticator  Dot1x-Authenticator
    1      Authenticator  MAB
```

This is an example of output from the **show eap registrations transport** privileged user EXEC command:

```
Switch> show eap registrations transport all
Registered EAP Lower Layers:
  Handle  Type      Name
    2      Authenticator  Dot1x-Authenticator
    1      Authenticator  MAB
```

This is an example of output from the **show eap sessions** privileged EXEC command:

```
Switch> show eap sessions
Role: Authenticator Decision: Fail
Lower layer: Dot1x-AuthenticatInterface: Gi0/1
Current method: None Method state: Uninitialised
Retransmission count: 0 (max: 2) Timer: Authenticator
ReqId Retransmit (timeout: 30s, remaining: 2s)
EAP handle: 0x5200000A Credentials profile: None
Lower layer context ID: 0x93000004 Eap profile name: None
Method context ID: 0x00000000 Peer Identity: None
Start timeout (s): 1 Retransmit timeout (s): 30 (30)
Current ID: 2 Available local methods: None

Role: Authenticator Decision: Fail
Lower layer: Dot1x-AuthenticatInterface: Gi0/2
Current method: None Method state: Uninitialised
Retransmission count: 0 (max: 2) Timer: Authenticator
ReqId Retransmit (timeout: 30s, remaining: 2s)
EAP handle: 0xA800000B Credentials profile: None
Lower layer context ID: 0x0D000005 Eap profile name: None
Method context ID: 0x00000000 Peer Identity: None
Start timeout (s): 1 Retransmit timeout (s): 30 (30)
Current ID: 2 Available local methods: None
```

<Output truncated>

This is an example of output from the **show eap sessions interface interface-id** privileged EXEC command:

```
Switch# show eap sessions gigabitethernet0/1
Role: Authenticator Decision: Fail
Lower layer: Dot1x-AuthenticatInterface: Gi0/1
Current method: None Method state: Uninitialised
Retransmission count: 1 (max: 2) Timer: Authenticator
ReqId Retransmit (timeout: 30s, remaining: 13s)
EAP handle: 0x5200000A Credentials profile: None
Lower layer context ID: 0x93000004 Eap profile name: None
```

```
Method context ID:      0x00000000      Peer Identity:          None
Start timeout (s):      1                Retransmit timeout (s): 30 (30)
Current ID:             2                Available local methods: None
```

**Related Commands**

Command	Description
<a href="#">clear eap sessions</a>	Clears EAP session information for the switch or for the specified port.

# show energywise

Use the **show energywise** privileged EXEC command to display the EnergyWise settings, the status of the entity, and the status of the power over Ethernet (PoE) ports.

**show energywise neighbors** [**categories** | **children** | **domain** | **events** | **level** [**children** | **current** [**children**] | **delta** | **delta children**] | **neighbors** | **recurrences** | **statistics** | **usage** [**children**] | **version**] [ | {**begin** | **exclude** | **include**} *expression*]

## Syntax Description

<b>categories</b>	(Optional) Display the power levels.
<b>children</b>	(Optional) Display the status of the entity and the PoE ports.
<b>domain</b>	(Optional) Display the domain to which the entity belongs.
<b>events</b>	(Optional) Displays the last ten events (messages) sent to other entities in the domain.
<b>level</b> [ <b>children</b>   <b>current</b> [ <b>children</b> ]   <b>delta</b>   <b>delta children</b> ]	(Optional) Display the available power levels. <ul style="list-style-type: none"> <li>• <b>children</b>—Available power levels for the entity and the PoE ports.</li> <li>• <b>current</b>—Current power levels for the entity.</li> </ul> (Optional) <b>children</b> —Current power levels for the entity and the PoE ports. <ul style="list-style-type: none"> <li>• <b>delta</b>—Difference between the current and available power levels for the entity.</li> </ul> (Optional) <b>children</b> —Difference between the current and available power levels for the entity and the PoE ports.
<b>neighbors</b>	(Optional) Display the neighbor table for the domain to which the entity belongs.
<b>recurrence</b>	(Optional) Display the EnergyWise settings and status for recurrence.
<b>statistics</b>	(Optional) Display the counters for events and errors.
<b>usage</b> [ <b>children</b> ]	(Optional) Display the available power for the entity. <ul style="list-style-type: none"> <li>• <b>children</b>—Display the available power for the PoE ports.</li> </ul>
<b>version</b>	(Optional) Display the EnergyWise version.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2(50)SE	This command was introduced.

**Usage Guidelines**

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

**Examples**

Switch# **show energywise**

Interface	Role	Name	Usage	Lvl	Imp	Type
-----	----	----	-----	---	---	----
	Switch	lobby.1	558.0 (W)	10	1	parent

Switch# **show energywise children**

Interface	Role	Name	Usage	Lvl	Imp	Type
-----	----	----	-----	---	---	----
	Switch	lobby.1	558.0 (W)	10	1	parent
Gi0/1	interface	Gi0.1	0.0 (W)	1	1	child
Gi0/2	interface	Gi0.2	0.0 (W)	1	1	child
Gi0/3	interface	Gi0.3	0.0 (W)	1	1	child
Gi0/4	interface	Gi0.4	0.0 (W)	1	1	child
Gi0/5	interface	Gi0.5	0.0 (W)	1	1	child
Gi0/6	interface	Gi0.6	0.0 (W)	1	1	child

Switch# **show energywise domain**

```
Name      : TG3560G-41
Domain    : cisco
Protocol   : udp
IP         : 2.2.2.21
Port      : 43440
```

Switch# **show energywise events**

```
-----
Sequence: 246818  References: 0:1  Errors:
Class:     PN_CLASS_QUERY
Action:    PN_ACTION_CPQR_POWERNET_QUERY_SET
Reply To:  8.8.8.24:43440
-----
Sequence: 246827  References: 0:1  Errors:
Class:     PN_CLASS_DISCOVERY
Action:    PN_ACTION_CPQR_POWERNET_DISCOVERY_DISCOVERY_UPDATE
Reply To:  8.8.8.24:43440
-----
```

Switch# **show energywise level**

Interface	Name	Levels (Watts)										
		0	1	2	3	4	5	6	7	8	9	10
-----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	lobby.1	0.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0

Switch# **show energywise level children**

Interface	Name	Levels (Watts)										
		0	1	2	3	4	5	6	7	8	9	10
-----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	lobby.1	0.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0	558.0
Gi0/1	Gi0.1	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Gi0/2	Gi0.2	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Gi0/3	Gi0.3	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Gi0/4	Gi0.4	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Gi0/5	Gi0.5	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4

<output truncated>

Switch# **show energywise level current**

Interface	Name	Level	Value
-----	----	-----	-----

## ■ show energywise

```
lobby.1          10      558.0 (W)
```

```
Switch# show energywise level current children
```

Interface	Name	Level	Value
-----	----	-----	-----
	lobby.1	10	558.0 (W)
Gi0/1	Gi0.1	1	15.4 (W)
Gi0/2	Gi0.2	1	15.4 (W)
Gi0/3	Gi0.3	1	15.4 (W)
Gi0/4	Gi0.4	1	15.4 (W)
Gi0/5	Gi0.5	1	15.4 (W)

```
<output truncated>
```

```
Switch# show energywise level delta
```

Interface	Name	Levels (Watts)										
		0	1	2	3	4	5	6	7	8	9	10
-----	----	-----										
	lobby.1	-558.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
Switch# show energywise level delta child
```

Interface	Name	Levels (Watts)											
		0	1	2	3	4	5	6	7	8	9	10	
-----	----	-----											
	lobby.1	-558.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Gi0/1	Gi0.1	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	
Gi0/2	Gi0.2	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	
Gi0/3	Gi0.3	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	
Gi0/4	Gi0.4	0.0	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	

```
<output truncated>
```

```
Switch# show energywise neighbors
```

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge

S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone

Id	Neighbor Name	Ip:Port	Prot	Capability
--	-----	-----	----	-----
1	Switch.A	2.2.2.29:43440	udp	S I
5	Switch.B	2.2.2.22:43440	udp	S I
7	Switch.C	2,2,2,33:43440	cdp	S I

```
Switch# show energywise recurrences
```

Id	Addr	Class	Action	Lvl	Cron
--	----	-----	-----	---	-----
2	Gi0/17	QUERY	SET	3	minutes: 0 hour: 8 day: * month: * weekday: *
3	Gi0/18	QUERY	SET	3	minutes: 0 hour: 8 day: * month: * weekday: *
4	Gi0/19	QUERY	SET	3	minutes: 0 hour: 8 day: * month: * weekday: *

```
Switch# show energywise statistics
```

Children: 48 Errors: 2 Drops: 0 Events: 14

```
Switch# show energywise usage
```

Interface	Name	Usage	Caliber
-----	----	-----	-----
	lobby.1	558.0 (W)	max



```
Switch# show energywise usage child
Interface      Name      Usage      Caliber
-----
lobby.1        lobby.1    558.0 (W)   max
Gi0/1          Gi0.1      0.0 (W)     presumed
Gi0/2          Gi0.2      0.0 (W)     presumed
Gi0/3          Gi0.3      0.0 (W)     presumed
Gi0/4          Gi0.4      0.0 (W)     presumed
Gi0/5          Gi0.5      0.0 (W)     presumed
<output truncated>

Switch# show energywise version
EnergyWise is Enabled
IOS Version: 12.2(50)SE
EnergyWise Specification: 1.0.1
```

## Related Commands


Command	Description
<a href="#">energywise (global configuration)</a>	Enables and configures EnergyWise on the entity.
<a href="#">energywise (interface configuration)</a>	Configures EnergyWise on the PoE port.

# show env

Use the **show env** user EXEC command to display temperature information for the switch.

```
show env {all || temperature} [ | {begin | exclude | include} expression]
```

Syntax Description	all	Display both fan and temperature environmental status.
	temperature	Display the switch temperature status.
	begin	(Optional) Display begins with the line that matches the <i>expression</i> .
	exclude	(Optional) Display excludes lines that match the <i>expression</i> .
	include	(Optional) Display includes lines that match the specified <i>expression</i> .
	expression	Expression in the output to use as a reference point.


  
Note

Though visible in the command-line help strings, the **fan**, **power**, and **rps** keywords are not supported.

Command Modes      User EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines      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.

  
Note

The **show env all** command does not display the fan or temperature status for the switch.

Examples      This is an example of output from the **show env all** command:

```
Switch> show env all
I/O Bay           : 2
Runtime Status    : OK
POST Result       : OK
```

This is an example of output from the **show env temperature** command:

```
Switch# sh env temperature
TEMPERATURE is OK
```

# show errdisable detect

Use the **show errdisable detect** user EXEC command to display error-disabled detection status.

**show errdisable detect** [ **|** { **begin** | **exclude** | **include** } *expression* ]

<b>Syntax Description</b>	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.
	12.2(37)SE	A mode column was added to the <b>show errdisable detect</b> output.

**Usage Guidelines**

A displayed `gbic-invalid` error reason refers to an invalid small form-factor pluggable (SFP) module. 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.

The error-disable reasons in the command output are listed in alphabetical order. The mode column shows how error disable is configured for each feature.

You can configure error-disabled detection in these modes:

- port mode—The entire physical port is error disabled if a violation occurs.
- vlan mode—The VLAN is error disabled if a violation occurs.
- port/vlan mode—The entire physical port is error disabled on some ports and per-VLAN error disabled on other ports.

**Examples**

This is an example of output from the **show errdisable detect** command:

```
Switch> show errdisable detect
ErrDisable Reason    Detection    Mode
-----
arp-inspection       Enabled     port
bpduguard            Enabled     vlan
channel-misconfig    Enabled     port
community-limit      Enabled     port
dhcp-rate-limit      Enabled     port
dtp-flap             Enabled     port
gbic-invalid         Enabled     port
inline-power         Enabled     port
invalid-policy       Enabled     port
l2ptguard            Enabled     port
link-flap            Enabled     port
```

■ show errdisable detect

loopback	Enabled	port
lsigroup	Enabled	port
pagp-flap	Enabled	port
psecure-violation	Enabled	port/vlan
security-violatio	Enabled	port
sfp-config-mismat	Enabled	port
storm-control	Enabled	port
udld	Enabled	port
vmps	Enabled	port

Related Commands

Command	Description
<a href="#">errdisable detect cause</a>	Enables error-disabled detection for a specific cause or all causes.
<a href="#">show errdisable flap-values</a>	Displays error condition recognition information.
<a href="#">show errdisable recovery</a>	Displays error-disabled recovery timer information.
<a href="#">show interfaces status</a>	Displays interface status or a list of interfaces in error-disabled state.

# show errdisable flap-values

Use the **show errdisable flap-values** user EXEC command to display conditions that cause an error to be recognized for a cause.

**show errdisable flap-values** [ | { **begin** | **exclude** | **include** } *expression* ]

<b>Syntax Description</b>	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**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 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.

ErrDisable Reason	Flaps	Time (sec)
pagp-flap	3	30
dtp-flap	3	30
link-flap	5	10

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**

This is an example of output from the **show errdisable flap-values** command:

```
Switch> show errdisable flap-values
ErrDisable Reason    Flaps    Time (sec)
-----
pagp-flap            3         30
dtp-flap              3         30
link-flap             5         10
```

■ show errdisable flap-values

Related Commands

Command	Description
<a href="#">errdisable detect cause</a>	Enables error-disabled detection for a specific cause or all causes.
<a href="#">show errdisable detect</a>	Displays error-disabled detection status.
<a href="#">show errdisable recovery</a>	Displays error-disabled recovery timer information.
<a href="#">show interfaces status</a>	Displays interface status or a list of interfaces in error-disabled state.

# show errdisable recovery

Use the **show errdisable recovery** user EXEC command to display the error-disabled recovery timer information.

**show errdisable recovery** [ | {**begin** | **exclude** | **include**} *expression*]

<b>Syntax Description</b>	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

<b>Usage Guidelines</b>	A <i>gbic-invalid error-disable</i> reason refers to an invalid small form-factor pluggable (SFP) module interface.
	Expressions are case sensitive. For example, if you enter <b>  exclude output</b> , the lines that contain <i>output</i> are not displayed, but the lines that contain <i>Output</i> are displayed.

<b>Examples</b>	This is an example of output from the <b>show errdisable recovery</b> command:
-----------------	--

```
Switch> show errdisable recovery
ErrDisable Reason    Timer Status
-----
udld                  Disabled
bpduguard             Disabled
security-violatio    Disabled
channel-misconfig    Disabled
vmps                  Disabled
pagp-flap             Disabled
dtp-flap              Disabled
link-flap             Enabled
l2ptguard             Disabled
psecure-violation    Disabled
gbic-invalid          Disabled
dhcp-rate-limit       Disabled
unicast-flood         Disabled
storm-control         Disabled
loopback              Disabled

Timer interval:300 seconds

Interfaces that will be enabled at the next timeout:
```

show errdisable recovery

Interface	Errdisable reason	Time left(sec)
-----	-----	-----
Gi0/2	link-flap	279



Note

Though visible in the output, the unicast-flood field is not valid.

Related Commands

Command	Description
<a href="#">errdisable recovery</a>	Configures the recover mechanism variables.
<a href="#">show errdisable detect</a>	Displays error-disabled detection status.
<a href="#">show errdisable flap-values</a>	Displays error condition recognition information.
<a href="#">show interfaces status</a>	Displays interface status or a list of interfaces in error-disabled state.



# show etherchannel

Use the **show etherchannel** user EXEC command to display EtherChannel information for a channel.

```
show etherchannel [channel-group-number {detail | port | port-channel | protocol | summary}]
                 {detail | load-balance | port | port-channel | protocol | summary} [ | {begin | exclude |
include} expression]
```

Syntax Description	
<i>channel-group-number</i>	(Optional) Number of the channel group. The range is 1 to 12.
<b>detail</b>	Display detailed EtherChannel information.
<b>load-balance</b>	Display the load-balance or frame-distribution scheme among ports in the port channel.
<b>port</b>	Display EtherChannel port information.
<b>port-channel</b>	Display port-channel information.
<b>protocol</b>	Display the protocol that is being used in the EtherChannel.
<b>summary</b>	Display a one-line summary per channel-group.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.
	12.2(50)SE	The <i>channel-group-number</i> range was incorrect. The correct range is from 1 to 12.

Usage Guidelines	<p>If you do not specify a <i>channel-group</i>, all channel groups are displayed.</p> <p>Expressions are case sensitive. For example, if you enter   <b>exclude output</b>, the lines that contain <i>output</i> are not displayed, but the lines that contain <i>Output</i> are displayed.</p>
------------------	--

Examples	This is an example of output from the <b>show etherchannel 1 detail</b> command:
----------	--

```
Switch> show etherchannel 1 detail
Group state = L2
Ports: 2    Maxports = 16
Port-channels: 1 Max Port-channels = 16
Protocol:   LACP
           Ports in the group:
           -----
Port: Gi0/1
-----
```

## show etherchannel

```

Port state      = Up Mstr In-Bndl
Channel group = 1          Mode = Active      Gcchange = -
Port-channel   = Po1      GC   = -          Pseudo port-channel = Po1
Port index     = 0        Load = 0x00      Protocol = LACP

Flags:  S - Device is sending Slow LACPDUs   F - Device is sending fast LACPDU
        A - Device is in active mode.         P - Device is in passive mode.

```

### Local information:

Port	Flags	State	LACP port Priority	Admin Key	Oper Key	Port Number	Port State
Gi0/1	SA	bndl	32768	0x0	0x1	0x0	0x3D

Age of the port in the current state: 01d:20h:06m:04s

### Port-channels in the group:

-----

Port-channel: Po1 (Primary Aggregator)

-----

```

Age of the Port-channel   = 01d:20h:20m:26s
Logical slot/port        = 10/1          Number of ports = 2
HotStandBy port = null
Port state               = Port-channel Ag-Inuse
Protocol                 = LACP

```

### Ports in the Port-channel:

Index	Load	Port	EC state	No of bits
0	00	Gi0/1	Active	0
0	00	Gi0/2	Active	0
0	00	Gi0/1	Active	0
0	00	Gi0/2	Active	0

Time since last port bundled: 01d:20h:20m:20s Gi0/2

This is an example of output from the **show etherchannel 1 summary** command:

```

Switch> show etherchannel 1 summary
Flags:  D - down          P - in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3       S - Layer2
        u - unsuitable for bundling
        U - in use       f - failed to allocate aggregator
        d - default port

```

```

Number of channel-groups in use: 1
Number of aggregators:          1

```

Group	Port-channel	Protocol	Ports
1	Po1 (SU)	LACP	Gi0/1 (P) Gi0/2 (P)
1	Po1 (SU)	LACP	Gi0/1 (P) Gi0/2 (P)

This is an example of output from the **show etherchannel 1 port-channel** command:

```

Switch> show etherchannel 1 port-channel
Port-channels in the group:
-----
Port-channel: Po1 (Primary Aggregator)

```

```

-----
Age of the Port-channel   = 01d:20h:24m:50s
Logical slot/port       = 10/1           Number of ports = 2
HotStandBy port = null
Port state               = Port-channel Ag-Inuse
Protocol                 = LACP

Ports in the Port-channel:

Index   Load   Port      EC state   No of bits
-----+-----+-----+-----+-----
    0     00   Gi0/1     Active      0
    0     00   Gi0/2     Active      0
    0     00   Gi0/1     Active      0
    0     00   Gi0/2     Active      0

Time since last port bundled:    01d:20h:24m:44s    Gi0/2

```

This is an example of output from the **show etherchannel protocol** command:

```

Switch# show etherchannel protocol
Channel-group listing:
-----
Group: 1
-----
Protocol: LACP

Group: 2
-----
Protocol: PAgP

```

## Related Commands

Command	Description
<a href="#">channel-group</a>	Assigns an Ethernet port to an EtherChannel group.
<a href="#">channel-protocol</a>	Restricts the protocol used on a port to manage channeling.
<a href="#">interface port-channel</a>	Accesses or creates the port channel.

# show fallback profile

Use the **show fallback profile** privileged EXEC command to display the fallback profiles that are configured on a switch.

**show fallback profile** [ **append** | **begin** | **exclude** | **include** | { [**redirect** | **tee** ] *url* } *expression* ]

Syntax Description	
<b>append</b>	(Optional) Append redirected output to a specified URL.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<b>redirect</b>	(Optional) Copy output to a specified URL.
<b>tee</b>	(Optional) Copy output to a specified URL.
<i>expression</i>	Expression in the output to use as a reference point.
<i>url</i>	Specified URL where output is directed.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	12.2(35)SE	This command was introduced.

**Usage Guidelines** Use the **show fallback profile** privileged EXEC command to display profiles that are configured on the switch.

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** This is an example of output from the **show fallback profile** command:

```
switch# show fall profile
Profile Name: dot1x-www
-----
Description          : NONE
IP Admission Rule    : webauth-fallback
IP Access-Group IN: default-policy
Profile Name: dot1x-www-lpip
-----
Description          : NONE
IP Admission Rule    : web-lpip
IP Access-Group IN: default-policy
Profile Name: profile1
-----
Description          : NONE
IP Admission Rule    : NONE
IP Access-Group IN: NONE
```

Related Commands	Command	Description
	<a href="#">dot1x fallback</a>	Configure a port to use web authentication as a fallback method for clients that do not support IEEE 802.1x authentication.
	<a href="#">fallback profile</a>	Specify the fallback profile for clients that do not support IEEE 802.1x authentication.
	<a href="#">ip admission</a>	Enable web authentication on a switch port
	<a href="#">ip admission name proxy http</a>	Enable web authentication globally on a switch
	<a href="#">show dot1x [interface interface-id]</a>	Displays IEEE 802.1x status for the specified port.

# show flowcontrol

Use the **show flowcontrol** user EXEC command to display the flow control status and statistics.

```
show flowcontrol [interface interface-id | module number] [ | {begin | exclude | include} expression]
```

## Syntax Description

<b>interface</b> <i>interface-id</i>	(Optional) Display the flow control status and statistics for a specific interface.
<b>module</b> <i>number</i>	(Optional) Display the flow control status and statistics for all interfaces on the switch. The only valid module number is 1. This option is not available if you have entered a specific interface ID.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

Use this command to display the flow control status and statistics on the switch or for a specific interface.

Use the **show flowcontrol** command to display information about all the switch interfaces. The output from the **show flowcontrol** command is the same as the output from the **show flowcontrol module number** command.

Use the **show flowcontrol interface interface-id** command to display information about a specific interface.

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

## Examples

This is an example of output from the **show flowcontrol** command.

```
Switch> show flowcontrol
Port          Send FlowControl  Receive FlowControl  RxPause  TxPause
              admin    oper      admin    oper
-----
Gi0/1         Unsupp.  Unsupp.   off      off      0        0
Gi0/2         desired  off       off      off      0        0
Gi0/3         desired  off       off      off      0        0
<output truncated>
```

This is an example of output from the **show flowcontrol interface *interface-id*** command:

```
Switch> show flowcontrol gigabitethernet0/2
Port          Send FlowControl  Receive FlowControl  RxPause TxPause
              admin    oper      admin    oper
-----
Gi0/2         desired  off       off      off      0        0
Gi0/2         desired  off       off      off      0        0
```

#### Related Commands

Command	Description
<a href="#">flowcontrol</a>	Sets the receive flow-control state for an interface.

# show idprom

Use the **show idprom** user EXEC command to display the IDPROM information for the specified interface.

**show idprom** {**interface** *interface-id*} [**detail**] [ **|** {**begin** | **exclude** | **include**} *expression*]

## Syntax Description

<b>interface</b> <i>interface-id</i>	Display the IDPROM information for the specified 10-Gigabit Ethernet interface.
<b>detail</b>	(Optional) Display detailed hexadecimal IDPROM information.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	This command was introduced.

## Usage Guidelines

This command applies only to 10-Gigabit Ethernet interfaces.

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

## Examples

This is an example of output from the **show idprom interface tengigabitethernet1/0/1** command for the 10-Gigabit Ethernet interface. It shows the XENPAK module serial EEPROM contents.

For information about the EEPROM map and the field descriptions for the display, see the XENPAK multisource agreement (MSA) at these sites:

[http://www.xenpak.org/MSA/XENPAK\\_MSA\\_R2.1.pdf](http://www.xenpak.org/MSA/XENPAK_MSA_R2.1.pdf)

[http://www.xenpak.org/MSA/XENPAK\\_MSA\\_R3.0.pdf](http://www.xenpak.org/MSA/XENPAK_MSA_R3.0.pdf)

To determine which version of the XENPAK documentation to read, check the *XENPAK MSA Version supported* field in the display. Version 2.1 is 15 hexadecimal, and Version 3.0 is 1E hexadecimal (not shown in the example).

```
Switch# show idprom interface tengigabitethernet1/0/1
TenGigabitEthernet1/0/1 (gpn:472, port-number:1)
```

```
-----
XENPAK Serial EEPROM Contents:
Non-Volatile Register (NVR) Fields
XENPAK MSA Version supported      :0x15
NVR Size in bytes                 :0x100
Number of bytes used              :0xD0
Basic Field Address               :0xB
```



```

Customer Field Address          :0x77
Vendor Field Address           :0xA7
Extended Vendor Field Address   :0x100
Reserved                       :0x0
Transceiver type                :0x1 =XENPAK
Optical connector type         :0x1 =SC
Bit encoding                    :0x1 =NRZ
Normal BitRate in multiple of 1M b/s :0x2848
Protocol Type                   :0x1 =10GgE

Standards Compliance Codes :
10GbE Code Byte 0              :0x2 =10GBASE-LR
10GbE Code Byte 1              :0x0
SONET/SDH Code Byte 0          :0x0
SONET/SDH Code Byte 1          :0x0
SONET/SDH Code Byte 2          :0x0
SONET/SDH Code Byte 3          :0x0
10GFC Code Byte 0              :0x0
10GFC Code Byte 1              :0x0
10GFC Code Byte 2              :0x0
10GFC Code Byte 3              :0x0
Transmission range in 10m      :0x3E8
Fibre Type :
Fibre Type Byte 0              :0x40 =NDSF only
Fibre Type Byte 1              :0x0 =Unspecified

Centre Optical Wavelength in 0.01nm steps - Channel 0 :0x1 0xFF 0xB8
Centre Optical Wavelength in 0.01nm steps - Channel 1 :0x0 0x0 0x0
Centre Optical Wavelength in 0.01nm steps - Channel 2 :0x0 0x0 0x0
Centre Optical Wavelength in 0.01nm steps - Channel 3 :0x0 0x0 0x0
Package Identifier OUI         :0x41F420
Transceiver Vendor OUI         :0x3400871
Transceiver vendor name        :CISCO-OPNEXT,INC
Part number provided by transceiver vendor           :800-24558-01
Revision level of part number provided by vendor :01
Vendor serial number           :ONJ0735003U
Vendor manufacturing date code :2003082700

Reserved1 :00 00 00 00 00 00 00
Basic Field Checksum :0x6C

Customer Writable Area :
0x00:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x20:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Vendor Specific :
0x00:41 00 20 F4 88 84 28 94 C0 00 30 14 06 39 00 D9
0x10:03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x20:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x30:00 00 00 00 11 5E 19 E9 BF 1B AD 98 03 9B DF 87
0x40:CC F6 45 FF 99 00 00 00 00 00 00 00 00 00 C0 48
0x50:46 D2 00 00 00 00 00 00 00 00 00 00 00 00 00 00

```

**Related Commands**

Command	Description
<a href="#">show controllers</a> <a href="#">ethernet-controller</a>	Displays per-interface send and receive statistics read from the hardware, interface internal registers, or port ASIC information.

# show interfaces

Use the **show interfaces** privileged EXEC command to display the administrative and operational status of all interfaces or a specified interface.

```
show interfaces [interface-id | vlan vlan-id] [accounting | capabilities [module number] |
counters | description | etherchannel | flowcontrol | private-vlan mapping | pruning | stats
| status [err-disabled] | switchport [backup | module number] | [module number] | trunk] [ |
{begin | exclude | include} } expression]
```

## Syntax Description

<i>interface-id</i>	(Optional) Valid interfaces include physical ports (including type, module, and port number) and port channels. The port-channel range is 1 to 12.
<b>vlan</b> <i>vlan-id</i>	(Optional) VLAN identification. The range is 1 to 4094.
<b>accounting</b>	(Optional) Display accounting information on the interface, including active protocols and input and output packets and octets.  <b>Note</b> The display shows only packets processed in software; hardware-switched packets do not appear.
<b>capabilities</b>	(Optional) Display the capabilities of all interfaces or the specified interface, including the features and options that you can configure on the interface. Though visible in the command line help, this option is not available for VLAN IDs.
<i>module number</i>	(Optional) Display <b>capabilities</b> , <b>switchport</b> configuration, or <b>transceiver</b> characteristics (depending on preceding keyword) of all interfaces on the switch. The only valid module number is 1. This option is not available if you entered a specific interface ID.
<b>counters</b>	(Optional) See the <a href="#">show interfaces counters</a> command.
<b>description</b>	(Optional) Display the administrative status and description set for an interface.
<b>etherchannel</b>	(Optional) Display interface EtherChannel information.
<b>flowcontrol</b>	(Optional) Display interface flowcontrol information
<b>private-vlan mapping</b>	(Optional) Display private-VLAN mapping information for the VLAN switch virtual interfaces (SVIs). This keyword is available only if your switch is running the IP services image, formerly known as the enhanced multilayer image (EMI).
<b>pruning</b>	(Optional) Display interface trunk VTP pruning information.
<b>stats</b>	(Optional) Display the input and output packets by switching path for the interface.
<b>status</b>	(Optional) Display the status of the interface. A status of <i>unsupported</i> in the Type field means that a non-Cisco small form-factor pluggable (SFP) module is inserted in the module slot.
<b>err-disabled</b>	(Optional) Display interfaces in error-disabled state.
<b>switchport</b>	(Optional) Display the administrative and operational status of a switching (nonrouting) port, including port blocking and port protection settings.
<b>backup</b>	(Optional) Display Flex Link backup interface configuration and status for the specified interface or all interfaces on the switch.
<b>trunk</b>	Display interface trunk information. If you do not specify an interface, only information for active trunking ports appears.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .

<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

**Note**

Though visible in the command-line help strings, the **crb**, **irb**, **mac-accounting**, **precedence**, **random-detect**, **rate-limit**, **shape**, and **transceiver** keywords are not supported.

**Command Modes**

Privileged EXEC

**Command History**

Release	Modification
12.2(25)SEE	This command was introduced.
12.2(50)SE	The <i>channel-group-number</i> range was incorrect. The correct range is from 1 to 12.

**Usage Guidelines**

The **show interfaces capabilities** command with different keywords has these results:

- Use the **show interface capabilities module 1** to display the capabilities of all interfaces on the switch. Entering any other number is invalid.
- Use the **show interfaces interface-id capabilities** to display the capabilities of the specified interface.
- Use the **show interfaces capabilities** (with no module number or interface ID) to display the capabilities of all interfaces on the switch.
- Use the **show interface switchport module** to display the switch port characteristics of all interfaces on the switch. Entering any other number is invalid.

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**

This is an example of output from the **show interfaces** command for an interface:

```
Switch# show interfaces gigabitethernet0/2
GigabitEthernet0/2 is down, line protocol is down
  Hardware is Gigabit Ethernet, address is 0009.43a7.d085 (bia 0009.43a7.d085)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Auto-duplex, Auto-speed
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00 Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    2 packets input, 1040 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
```

```

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input
0 input packets with dribble condition detected
4 packets output, 1040 bytes, 0 underruns
0 output errors, 0 collisions, 3 interface resets
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 PAUSE output
0 output buffer failures, 0 output buffers swapped out

```

This is an example of output from the **show interfaces accounting** command.

```
Switch# show interfaces accounting
```

```

Vlan1
          Protocol    Pkts In   Chars In   Pkts Out   Chars Out
          IP          1094395  131900022  559555     84077157
          Spanning Tree 283896   17033760   42         2520
          ARP          63738    3825680    231        13860
Interface Vlan2 is disabled
Vlan7
          Protocol    Pkts In   Chars In   Pkts Out   Chars Out
No traffic sent or received on this interface.
Vlan31
          Protocol    Pkts In   Chars In   Pkts Out   Chars Out
No traffic sent or received on this interface.

GigabitEthernet0/1
          Protocol    Pkts In   Chars In   Pkts Out   Chars Out
No traffic sent or received on this interface.
GigabitEthernet0/2
          Protocol    Pkts In   Chars In   Pkts Out   Chars Out
No traffic sent or received on this interface.

<output truncated>

```

This is an example of output from the **show interfaces capabilities** command for an interface.

```
Switch# show interfaces gigabitethernet0/2 capabilities
```

```

GigabitEthernet0/2
  Model:                               WS-CBS3030-DEL

  Type:                                10/100/1000BaseTX
  Speed:                               10,100,1000,auto
  Duplex:                              full,auto
  Trunk encap. type:                   802.1Q,ISL
  Trunk mode:                          on,off,desirable,nonegotiate
  Channel:                             yes
  Broadcast suppression:               percentage(0-100)
  Flowcontrol:                         rx-(off,on,desired),tx-(none)
  Fast Start:                          yes
  QoS scheduling:                      rx-(not configurable on per port basis),tx-(4q2t)
  CoS rewrite:                         yes
  ToS rewrite:                         yes
  UDLD:                                yes
  Inline power:                        no
  SPAN:                                source/destination
  PortSecure:                          yes
  Dot1x:                               yes

```

This is an example of output from the **show interfaces interface description** command when the interface has been described as *Connects to Marketing* by using the **description** interface configuration command.

```
Switch# show interfaces gigabitethernet0/2 description
```

```
Interface Status      Protocol Description
```

```
Gi0/2      up                down      Connects to Marketing
```

This is an example of output from the **show interfaces etherchannel** command when port channels are configured on the switch:

```
Switch# show interfaces etherchannel
----
Port-channel1:
Age of the Port-channel   = 03d:20h:17m:29s
Logical slot/port        = 10/1          Number of ports = 0
GC                        = 0x00000000    HotStandBy port = null
Port state                = Port-channel Ag-Not-Inuse

Port-channel2:
Age of the Port-channel   = 03d:20h:17m:29s
Logical slot/port        = 10/2          Number of ports = 0
GC                        = 0x00000000    HotStandBy port = null
Port state                = Port-channel Ag-Not-Inuse

Port-channel3:
Age of the Port-channel   = 03d:20h:17m:29s
Logical slot/port        = 10/3          Number of ports = 0
GC                        = 0x00000000    HotStandBy port = null
Port state                = Port-channel Ag-Not-Inuse
```

This is an example of output from the **show interfaces interface-id pruning** command when pruning is enabled in the VTP domain:

```
Switch# show interfaces gigabitethernet0/2 pruning
Port      Vlans pruned for lack of request by neighbor
Gi0/2     3,4

Port      Vlans traffic requested of neighbor
Gi0/2     1-3
```

This is an example of output from the **show interfaces stats** command for a specified VLAN interface.

```
Switch# show interfaces vlan 1 stats
Switching path  Pkts In   Chars In   Pkts Out   Chars Out
Processor       1165354   136205310   570800     91731594
Route cache      0         0           0           0
Total           1165354   136205310   570800     91731594
```

This is an example of partial output from the **show interfaces status** command. It displays the status of all interfaces.

```
Switch# show interfaces status
Port      Name              Status      Vlan      Duplex  Speed Type
Gi0/1     notconnect        1           auto      auto    10/100/1000BaseTX
Gi0/2     notconnect        1           auto      auto    10/100/1000BaseTX
Gi0/3     notconnect        1           auto      auto    10/100/1000BaseTX
Gi0/4     notconnect        1           auto      auto    10/100/1000BaseTX
Gi0/5     notconnect        1           auto      auto    10/100/1000BaseTX
Gi0/6     notconnect        1           auto      auto    10/100/1000BaseTX
```

<output truncated>

This is an example of output from the **show interfaces status err-disabled** command. It displays the status of interfaces in the error-disabled state.

```
Switch# show interfaces status err-disabled
Port      Name              Status      Reason
Gi0/2     err-disabled      dtp-flap
```

This is an example of output from the **show interfaces switchport** command for a port. [Table 2-24](#) describes the fields in the display.

**Note**

Private VLANs trunks are not supported in this release, so those fields are not applicable.

```
Switch# show interfaces gigabitEthernet0/1 switchport
Name: Gi0/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: static access
Administrative Trunking Encapsulation: negotiate
Operational Trunking Encapsulation: native
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association:10 (VLAN0010) 502 (VLAN0502)
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL

Protected: false
Unknown unicast blocked: disabled
Unknown multicast blocked: disabled

Voice VLAN: none (Inactive)
Appliance trust: none
```

This is an example of out put from the **show interfaces switchport backup** command when a Flex Link interface goes down (LINK\_DOWN), and VLANs preferred on this interface are moved to the peer interface of the Flex Link pair. In this example, if interface Gi0/6 goes down, Gi0/8 carries all VLANs of the Flex Link pair.

```
Switch#show interfaces switchport backup
Switch Backup Interface Pairs:
```

Active Interface	Backup Interface	State
GigabitEthernet0/6	GigabitEthernet0/8	Active Down/Backup Up

```
Vlans Preferred on Active Interface: 1-50
Vlans Preferred on Backup Interface: 60, 100-120
```

This is an example of output from the **show interfaces switchport backup** command. In this example, VLANs 1 to 50, 60, and 100 to 120 are configured on the switch:

```
Switch(config)# interface gigabitEthernet 0/6
Switch(config-if)# switchport backup interface gigabitEthernet 0/8 prefer vlan 60,100-120
```

When both interfaces are up, Gi0/8 forwards traffic for VLANs 60, 100 to 120, and Gi0/6 will forward traffic for VLANs 1 to 50.

```
Switch# show interfaces switchport backup
Switch Backup Interface Pairs:
```

Active Interface	Backup Interface	State
GigabitEthernet0/6	GigabitEthernet0/8	Active Up/Backup Up

```
Vlans on Interface Gi 0/6: 1-50
Vlans on Interface Gi 0/8: 60, 100-120
```

When a Flex Link interface goes down (LINK\_DOWN), VLANs preferred on this interface are moved to the peer interface of the Flex Link pair. In this example, if interface Gi0/6 goes down, Gi0/8 carries all VLANs of the Flex Link pair.

```
Switch# show interfaces switchport backup
Switch Backup Interface Pairs:
```

Active Interface	Backup Interface	State
GigabitEthernet0/6	GigabitEthernet0/8	Active Down/Backup Up

```
Vlans on Interface Gi 0/6:
Vlans on Interface Gi 0/8: 1-50, 60, 100-120
```

When a Flex Link interface comes up, VLANs preferred on this interface are blocked on the peer interface and moved to the forwarding state on the interface that has just come up. In this example, if interface Gi0/6 comes up, then VLANs preferred on this interface are blocked on the peer interface Gi0/8 and forwarded on Gi0/6.

```
Switch# show interfaces switchport backup
Switch Backup Interface Pairs:
```

Active Interface	Backup Interface	State
GigabitEthernet0/6	GigabitEthernet0/8	Active Up/Backup Up

```
Vlans on Interface Gi 0/6: 1-50
Vlans on Interface Gi 0/8: 60, 100-120
```

**Table 2-24** *show interfaces switchport Field Descriptions*

Field	Description
Name	Displays the port name.
Switchport	Displays the administrative and operational status of the port. In this display, the port is in switchport mode.
Administrative Mode	Displays the administrative and operational modes.
Operational Mode	
Administrative Trunking Encapsulation	Displays the administrative and operational encapsulation method and whether trunking negotiation is enabled.
Operational Trunking Encapsulation	
Negotiation of Trunking	
Access Mode VLAN	Displays the VLAN ID to which the port is configured.

**Table 2-24** *show interfaces switchport Field Descriptions (continued)*

Field	Description
Trunking Native Mode VLAN	Lists the VLAN ID of the trunk that is in native mode. Lists the allowed VLANs on the trunk. Lists the active VLANs on the trunk.
Trunking VLANs Enabled	
Trunking VLANs Active	
Pruning VLANs Enabled	Lists the VLANs that are pruning-eligible.
Protected	Displays whether or not protected port is enabled (True) or disabled (False) on the interface.
Unknown unicast blocked	Displays whether or not unknown multicast and unknown unicast traffic is blocked on the interface.
Unknown multicast blocked	
Voice VLAN	Displays the VLAN ID on which voice VLAN is enabled.
Administrative private-vlan host-association	Displays the administrative VLAN association for private-VLAN host ports.
Administrative private-vlan mapping	Displays the administrative VLAN mapping for private-VLAN promiscuous ports.
Operational private-vlan	Displays the operational private-VLAN status.
Appliance trust	Displays the class of service (CoS) setting of the data packets of the IP phone.

This is an example of output from the **show interfaces switchport backup** command:

```
Switch# show interfaces switchport backup
Switch Backup Interface Pairs:
      Active Interface      Backup Interface      State
-----
      Gi0/1                 Gi0/2                 Active Up/Backup Standby
      Gi0/3                 Gi0/5                 Active Down/Backup Up
      Po1                   Po2                   Active Standby/Backup Up
```

This is an example of output from the **show interfaces interface-id pruning** command:

```
Switch# show interfaces gigabitethernet0/2 pruning
Port      Vlans pruned for lack of request by neighbor
```

This is an example of output from the **show interfaces interface-id trunk** command. It displays trunking information for the port.

```
Switch# show interfaces gigabitethernet0/1 trunk
Port      Mode      Encapsulation  Status      Native vlan
Gi0/1     auto      negotiate      trunking    1

Port      Vlans allowed on trunk
Gi0/1     1-4094

Port      Vlans allowed and active in management domain
Gi0/1     1-4

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/1     1-4
```



Related Commands	Command	Description
	<b>switchport access</b>	Configures a port as a static-access or a dynamic-access port.
	<b>switchport block</b>	Blocks unknown unicast or multicast traffic on an interface.
	<b>switchport backup interface</b>	Configures Flex Links, a pair of Layer 2 interfaces that provide mutual backup.
	<b>switchport mode</b>	Configures the VLAN membership mode of a port.
	<b>switchport mode private-vlan</b>	Configures a port as a private-VLAN host or a promiscuous port.
	<b>switchport private-vlan</b>	Defines private-VLAN association for a host port or private-VLAN mapping for a promiscuous port.
	<b>switchport protected</b>	Isolates unicast, multicast, and broadcast traffic at Layer 2 from other protected ports on the same switch.
	<b>switchport trunk pruning</b>	Configures the VLAN pruning-eligible list for ports in trunking mode.

# show interfaces counters

Use the **show interfaces counters** privileged EXEC command to display various counters for the switch or for a specific interface.

**show interfaces** [*interface-id* | **vlan** *vlan-id*] **counters** [**errors** | **etherchannel** | **protocol status** | **trunk**] [ | {**begin** | **exclude** | **include**} *expression*]

Syntax Description	
<i>interface-id</i>	(Optional) ID of the physical interface, including type, module, and port number.
<b>errors</b>	(Optional) Display error counters.
<b>etherchannel</b>	(Optional) Display EtherChannel counters, including octets, broadcast packets, multicast packets, and unicast packets received and sent.
<b>protocol status</b>	(Optional) Display status of protocols enabled on interfaces.
<b>trunk</b>	(Optional) Display trunk counters.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.



## Note

Though visible in the command-line help string, the **vlan** *vlan-id* keyword is not supported.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** If you do not enter any keywords, all counters for all interfaces are included.

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** This is an example of partial output from the **show interfaces counters** command. It displays all counters for the switch.

```
Switch# show interfaces counters
Port          InOctets    InUcastPkts  InMcastPkts  InBcastPkts
Gi0/1          0            0             0             0
Gi0/2          0            0             0             0

<output truncated>
```

This is an example of partial output from the **show interfaces counters protocol status** command for all interfaces.

```
Switch# show interfaces counters protocol status
Protocols allocated:
  Vlan1: Other, IP, ARP
  GigabitEthernet0/1: Other, IP, Spanning Tree, CDP
  GigabitEthernet0/2: Other, IP, CDP
  GigabitEthernet0/3: Other, IP, CDP
  GigabitEthernet0/4: Other, IP, CDP
  GigabitEthernet0/5: Other, IP, CDP
  GigabitEthernet0/6: Other, IP, CDP
  GigabitEthernet0/7: Other, IP, CDP
  GigabitEthernet0/8: Other, IP, CDP
  GigabitEthernet0/9: Other, IP, CDP
  GigabitEthernet0/10: Other, IP, CDP
  GigabitEthernet0/11: Other, IP, Spanning Tree, CDP
  GigabitEthernet0/12: Other, IP
  GigabitEthernet0/13: Other, IP
  GigabitEthernet0/14: Other, IP
  GigabitEthernet0/15: Other, IP
  GigabitEthernet0/16: Other, IP
```

Allocation failures: 0

```
Protocols allocated:
  Vlan1: Other, IP
  Vlan20: Other, IP, ARP
  Vlan30: Other, IP, ARP
  Vlan40: Other, IP, ARP
  Vlan50: Other, IP, ARP
  Vlan60: Other, IP, ARP
  Vlan70: Other, IP, ARP
  Vlan80: Other, IP, ARP
  Vlan90: Other, IP, ARP
  Vlan900: Other, IP, ARP
  Vlan3000: Other, IP
  Vlan3500: Other, IP
  FastEthernet1/0/1: Other, IP, ARP, CDP
  FastEthernet1/0/2: Other, IP
  FastEthernet1/0/3: Other, IP
  FastEthernet1/0/4: Other, IP
  FastEthernet1/0/5: Other, IP
  FastEthernet1/0/6: Other, IP
  FastEthernet1/0/7: Other, IP
  FastEthernet1/0/8: Other, IP
  FastEthernet1/0/9: Other, IP
  FastEthernet1/0/10: Other, IP, CDP
```

<output truncated>

This is an example of output from the **show interfaces counters trunk** command. It displays trunk counters for all interfaces.

```
Switch# show interfaces counters trunk
Port      TrunkFramesTx  TrunkFramesRx  WrongEncap
Gi0/1      0              0              0
Gi0/2      0              0              0
Gi0/3      80678          4155           0
Gi0/4      82320          126            0
Gi0/5      0              0              0
```

<output truncated>

■ show interfaces counters

Related Commands

Command	Description
<a href="#">show interfaces</a>	Displays additional interface characteristics.

# show inventory

Use the **show inventory** user EXEC command to display product identification (PID) information for the hardware.

**show inventory** [*entity-name* | **raw**] [ | { **begin** | **exclude** | **include** } *expression*]

## Syntax Description

<i>entity-name</i>	(Optional) Display the specified entity. For example, enter the interface (such as gigabitethernet0/1) into which a small form-factor pluggable (SFP) module is installed.
<b>raw</b>	(Optional) Display every entity in the device.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

The command is case sensitive. With no arguments, the **show inventory** command produces a compact dump of all identifiable entities that have a product identifier. The compact dump displays the entity location (slot identity), entity description, and the unique device identifier (UDI) (PID, VID, and SN) of that entity.



### Note

If there is no PID, no output appears when you enter the **show inventory** command.

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

This is example output from the **show inventory** command:

```
switch# show inventory
NAME: "1", DESCR: "WS-CBS3030-DEL"
PID: WS-CBS3030-DEL-F , VID: V01, SN: FSJC0523550

NAME: "GigabitEthernet0/13", DESCR: "1000BaseSX SFP"
PID: , VID: , SN: H11FS9R
```

# show ip dhcp snooping

Use the **show ip dhcp snooping** user EXEC command to display the DHCP snooping configuration.

**show ip dhcp snooping** [ **|** { **begin** | **exclude** | **include** } *expression* ]

Syntax Description	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter <b>  exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
	This command displays only the results of global configuration. Therefore, in this example, the circuit ID suboption appears in its default format of <b>vlan-mod-port</b> , even if a string is configured for the circuit ID.

Examples	This is an example of output from the <b>show ip dhcp snooping</b> command:
----------	---

```
Switch> show ip dhcp snooping
Switch DHCP snooping is enabled
DHCP snooping is configured on following VLANs:
40-42
Insertion of option 82 is enabled
    circuit-id format: vlan-mod-port
    remote-id format: string
Option 82 on untrusted port is allowed
Verification of hwaddr field is enabled
Interface                Trusted      Rate limit (pps)
-----
GigabitEthernet0/1       yes         unlimited
GigabitEthernet0/2       yes         unlimited
GigabitEthernet0/3       no          2000
GigabitEthernet0/4       yes         unlimited
GigabitEthernet0/1       yes         unlimited
GigabitEthernet0/2       yes         unlimited
```

Related Commands	<b>Command</b>	<b>Description</b>
	<a href="#">show ip dhcp snooping binding</a>	Displays the DHCP snooping binding information.

# show ip dhcp snooping binding

Use the **show ip dhcp snooping binding** user EXEC command to display the DHCP snooping binding database and configuration information for all interfaces on a switch.

**show ip dhcp snooping binding** [*ip-address*] [*mac-address*] [**interface** *interface-id*] [**vlan** *vlan-id*]  
[ | {**begin** | **exclude** | **include**} *expression*]

<b>Syntax Description</b>	<i>ip-address</i>	(Optional) Specify the binding entry IP address.
	<i>mac-address</i>	(Optional) Specify the binding entry MAC address.
	<b>interface</b> <i>interface-id</i>	(Optional) Specify the binding input interface.
	<b>vlan</b> <i>vlan-id</i>	(Optional) Specify the binding entry VLAN.
	<b>begin</b>	Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	Display excludes lines that match the <i>expression</i> .
	<b>include</b>	Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** The **show ip dhcp snooping binding** command output shows only the dynamically configured bindings. Use the **show ip source binding** privileged EXEC command to display the dynamically and statically configured bindings in the DHCP snooping binding database.

If DHCP snooping is enabled and an interface changes to the down state, the switch does not delete the statically configured bindings.

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

**Examples** This example shows how to display the DHCP snooping binding entries for a switch:

```
Switch> show ip dhcp snooping binding
MacAddress      IpAddress      Lease(sec)  Type           VLAN  Interface
-----
01:02:03:04:05:06  10.1.2.150    9837        dhcp-snooping  20    GigabitEthernet0/1
00:D0:B7:1B:35:DE  10.1.2.151    237         dhcp-snooping  20    GigabitEthernet0/2
Total number of bindings: 2
```

**show ip dhcp snooping binding**

This example shows how to display the DHCP snooping binding entries for a specific IP address:

```
Switch> show ip dhcp snooping binding 10.1.2.150
-----
MacAddress      IpAddress      Lease(sec)    Type           VLAN    Interface
-----
01:02:03:04:05:06  10.1.2.150    9810          dhcp-snooping  20      GigabitEthernet0/1
Total number of bindings: 1
```

This example shows how to display the DHCP snooping binding entries for a specific MAC address:

```
Switch> show ip dhcp snooping binding 0102.0304.0506
-----
MacAddress      IpAddress      Lease(sec)    Type           VLAN    Interface
-----
01:02:03:04:05:06  10.1.2.150    9788          dhcp-snooping  20      GigabitEthernet0/2
Total number of bindings: 1
```

This example shows how to display the DHCP snooping binding entries on a port:

```
Switch> show ip dhcp snooping binding interface gigabitethernet0/2
-----
MacAddress      IpAddress      Lease(sec)    Type           VLAN    Interface
-----
00:30:94:C2:EF:35  10.1.2.151    290           dhcp-snooping  20      GigabitEthernet0/2
Total number of bindings: 1
```

This example shows how to display the DHCP snooping binding entries on VLAN 20:

```
Switch> show ip dhcp snooping binding vlan 20
-----
MacAddress      IpAddress      Lease(sec)    Type           VLAN    Interface
-----
01:02:03:04:05:06  10.1.2.150    9747          dhcp-snooping  20      GigabitEthernet0/1
00:00:00:00:00:02  10.1.2.151    65           dhcp-snooping  20      GigabitEthernet0/2
Total number of bindings: 2
```

Table 2-25 describes the fields in the **show ip dhcp snooping binding** command output:

**Table 2-25** *show ip dhcp snooping binding Command Output*

Field	Description
MacAddress	Client hardware MAC address
IpAddress	Client IP address assigned from the DHCP server
Lease(sec)	Remaining lease time for the IP address
Type	Binding type
VLAN	VLAN number of the client interface
Interface	Interface that connects to the DHCP client host
Total number of bindings	Total number of bindings configured on the switch
	<b>Note</b> The command output might not show the total number of bindings. For example, if 200 bindings are configured on the switch and you stop the display before all the bindings appear, the total number does not change.

**Related Commands**

Command	Description
<b>ip dhcp snooping binding</b>	Configures the DHCP snooping binding database
<b>show ip dhcp snooping</b>	Displays the DHCP snooping configuration.



# show ip dhcp snooping database

Use the **show ip dhcp snooping database** user EXEC command to display the status of the DHCP snooping binding database agent.

**show ip dhcp snooping database** [**detail**] [ | {**begin** | **exclude** | **include**} *expression*]

This command is available only if your switch is running the IP services image, formerly known as the enhanced multilayer image (EMI).

## Syntax Description

<b>detail</b>	(Optional) Display detailed status and statistics information.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	This command was introduced.

## Examples

This is an example of output from the **show ip dhcp snooping database** command:

```
Switch> show ip dhcp snooping database
Agent URL :
Write delay Timer : 300 seconds
Abort Timer : 300 seconds

Agent Running : No
Delay Timer Expiry : Not Running
Abort Timer Expiry : Not Running

Last Succeeded Time : None
Last Failed Time : None
Last Failed Reason : No failure recorded.

Total Attempts      :          0   Startup Failures :          0
Successful Transfers :          0   Failed Transfers :          0
Successful Reads     :          0   Failed Reads     :          0
Successful Writes    :          0   Failed Writes    :          0
Media Failures       :          0
```

This is an example of output from the **show ip dhcp snooping database detail** command:

```
Switch# show ip dhcp snooping database detail
Agent URL : tftp://10.1.1.1/directory/file
Write delay Timer : 300 seconds
Abort Timer : 300 seconds
```

## show ip dhcp snooping database

```

Agent Running : No
Delay Timer Expiry : 7 (00:00:07)
Abort Timer Expiry : Not Running

Last Succeeded Time : None
Last Failed Time : 17:14:25 UTC Sat Jul 7 2001
Last Failed Reason : Unable to access URL.

Total Attempts      :      21   Startup Failures :      0
Successful Transfers :      0   Failed Transfers  :     21
Successful Reads    :      0   Failed Reads   :      0
Successful Writes   :      0   Failed Writes  :     21
Media Failures      :      0

First successful access: Read

Last ignored bindings counters :
Binding Collisions   :      0   Expired leases   :      0
Invalid interfaces   :      0   Unsupported vlans :      0
Parse failures       :      0

Last Ignored Time : None

Total ignored bindings counters:
Binding Collisions   :      0   Expired leases   :      0
Invalid interfaces   :      0   Unsupported vlans :      0
Parse failures       :      0

```

### Related Commands

Command	Description
<a href="#">ip dhcp snooping</a>	Enables DHCP snooping on a VLAN.
<a href="#">ip dhcp snooping database</a>	Configures the DHCP snooping binding database agent or the binding file.
<a href="#">show ip dhcp snooping</a>	Displays DHCP snooping information.

# show ip dhcp snooping statistics

Use the **show ip dhcp snooping statistics** user EXEC command to display DHCP snooping statistics in summary or detail form.

**show ip dhcp snooping statistics** [**detail**] [ | {**begin** | **exclude** | **include**} *expression*]

Syntax Description	
<b>detail</b>	(Optional) Display detailed statistics information.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(37)SE	This command was introduced.

Usage Guidelines	<p>Expressions are case sensitive. For example, if you enter   <b>exclude output</b>, the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.</p> <p>In a switch stack, all statistics are generated on the stack master. If a new stack master is elected, the statistics counters reset.</p>
------------------	---

Examples	This is an example of output from the <b>show ip dhcp snooping statistics</b> command:
----------	--

```
Switch> show ip dhcp snooping statistics
Packets Forwarded                = 0
Packets Dropped                  = 0
Packets Dropped From untrusted ports = 0
```

This is an example of output from the **show ip dhcp snooping statistics detail** command:

```
Switch> show ip dhcp snooping statistics detail
Packets Processed by DHCP Snooping = 0
Packets Dropped Because
  IDB not known                    = 0
  Queue full                       = 0
  Interface is in errdisabled      = 0
  Rate limit exceeded              = 0
  Received on untrusted ports      = 0
  Nonzero giaddr                   = 0
  Source mac not equal to chaddr   = 0
  Binding mismatch                  = 0
  Insertion of opt82 fail          = 0
  Interface Down                   = 0
  Unknown output interface         = 0
  Reply output port equal to input port = 0
  Packet denied by platform        = 0
```

Table 2-26 shows the DHCP snooping statistics and their descriptions:

**Table 2-26 DHCP Snooping Statistics**

DHCP Snooping Statistic	Description
Packets Processed by DHCP Snooping	Total number of packets handled by DHCP snooping, including forwarded and dropped packets.
Packets Dropped Because IDB not known	Number of errors when the input interface of the packet cannot be determined.
Queue full	Number of errors when an internal queue used to process the packets is full. This might happen if DHCP packets are received at an excessively high rate and rate limiting is not enabled on the ingress ports.
Interface is in errdisabled	Number of times a packet was received on a port that has been marked as error disabled. This might happen if packets are in the processing queue when a port is put into the error-disabled state and those packets are subsequently processed.
Rate limit exceeded	Number of times the rate limit configured on the port was exceeded and the interface was put into the error-disabled state.
Received on untrusted ports	Number of times a DHCP server packet (OFFER, ACK, NAK, or LEASEQUERY) was received on an untrusted port and was dropped.
Nonzero giaddr	Number of times the relay agent address field (giaddr) in the DHCP packet received on an untrusted port was not zero, or the <b>no ip dhcp snooping information option allow-untrusted</b> global configuration command is not configured and a packet received on an untrusted port contained option-82 data.
Source mac not equal to chaddr	Number of times the client MAC address field of the DHCP packet (chaddr) does not match the packet source MAC address and the <b>ip dhcp snooping verify mac-address</b> global configuration command is configured.
Binding mismatch	Number of times a RELEASE or DECLINE packet was received on a port that is different than the port in the binding for that MAC address-VLAN pair. This indicates someone might be trying to spoof the real client, or it could mean that the client has moved to another port on the switch and issued a RELEASE or DECLINE. The MAC address is taken from the chaddr field of the DHCP packet, not the source MAC address in the Ethernet header.
Insertion of opt82 fail	Number of times the option-82 insertion into a packet failed. The insertion might fail if the packet with the option-82 data exceeds the size of a single physical packet on the internet.

**Table 2-26 DHCP Snooping Statistics**

DHCP Snooping Statistic	Description
Interface Down	Number of times the packet is a reply to the DHCP relay agent, but the SVI interface for the relay agent is down. This is an unlikely error that occurs if the SVI goes down between sending the client request to the DHCP server and receiving the response.
Unknown output interface	Number of times the output interface for a DHCP reply packet cannot be determined by either option-82 data or a lookup in the MAC address table. The packet is dropped. This can happen if option 82 is not used and the client MAC address has aged out. If IPSG is enabled with the port-security option and option 82 is not enabled, the MAC address of the client is not learned, and the reply packets will be dropped.
Reply output port equal to input port	Number of times the output port for a DHCP reply packet is the same as the input port, causing a possible loop. Indicates a possible network misconfiguration or misuse of trust settings on ports.
Packet denied by platform	Number of times the packet has been denied by a platform-specific registry.

**Related Commands**

Command	Description
<a href="#">clear ip dhcp snooping</a>	Clears the DHCP snooping binding database, the DHCP snooping binding database agent statistics, or the DHCP snooping statistics counters.

# show ip igmp profile

Use the **show ip igmp profile** privileged EXEC command to display all configured Internet Group Management Protocol (IGMP) profiles or a specified IGMP profile.

**show ip igmp profile** [*profile number*] [ | { **begin** | **exclude** | **include** } *expression*]

Syntax Description	<i>profile number</i>	(Optional) The IGMP profile number to be displayed. The range is 1 to 4294967295. If no profile number is entered, all IGMP profiles are displayed.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

**Command Modes** Privileged EXEC

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** 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** These are examples of output from the **show ip igmp profile** privileged EXEC command, with and without specifying a profile number. If no profile number is entered, the display includes all profiles configured on the switch.

```
Switch# show ip igmp profile 40
IGMP Profile 40
  permit
  range 233.1.1.1 233.255.255.255

Switch# show ip igmp profile
IGMP Profile 3
  range 230.9.9.0 230.9.9.0
IGMP Profile 4
  permit
  range 229.9.9.0 229.255.255.255
```

Related Commands	<b>Command</b>	<b>Description</b>
	<a href="#">ip igmp profile</a>	Configures the specified IGMP profile number.

# show ip igmp snooping

Use the **show ip igmp snooping** user EXEC command to display the Internet Group Management Protocol (IGMP) snooping configuration of the switch or the VLAN.

```
show ip igmp snooping [groups | mrouter | querier] [vlan vlan-id] [ | {begin | exclude | include}
expression]
```

Syntax Description	
<b>groups</b>	(Optional) See the <a href="#">show ip igmp snooping groups</a> command.
<b>mrouter</b>	(Optional) See the <a href="#">show ip igmp snooping mrouter</a> command.
<b>querier</b>	(Optional) See the <a href="#">show ip igmp snooping querier</a> command.
<b>vlan <i>vlan-id</i></b>	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094 (available only in privileged EXEC mode).
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<b><i>expression</i></b>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	<p>Use this command to display snooping configuration for the switch or for a specific VLAN.</p> <p>VLAN IDs 1002 to 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in IGMP snooping.</p> <p>Expressions are case sensitive. For example, if you enter <b>  exclude output</b>, the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.</p>
------------------	--

Examples	<p>This is an example of output from the <b>show ip igmp snooping vlan 1</b> command. It shows snooping characteristics for a specific VLAN.</p>
----------	--

```
Switch# show ip igmp snooping vlan 1
Global IGMP Snooping configuration:
-----
IGMP snooping                : Enabled
IGMPv3 snooping (minimal)    : Enabled
Report suppression           : Enabled
TCN solicit query            : Disabled
TCN flood query count        : 2
Last Member Query Interval   : 1000
```

## show ip igmp snooping

```

Vlan 1:
-----
IGMP snooping                        : Enabled
IGMPv2 immediate leave              : Disabled
Explicit host tracking               : Enabled
Multicast router learning mode      : pim-dvmrp
Last Member Query Interval          : 1000
CGMP interoperability mode          : IGMP_ONLY

Switch# show ip igmp snooping vlan 1
Global IGMP Snooping configuration:
-----
IGMP snooping                       : Enabled
IGMPv3 snooping (minimal)           : Enabled
Report suppression                   : Enabled
TCN solicit query                   : Disabled
TCN flood query count                : 2
Last member query interval          : 100

Vlan 1:
-----
IGMP snooping                       : Enabled
Immediate leave                     : Disabled
Multicast router learning mode       : pim-dvmrp
Source only learning age timer       : 10
CGMP interoperability mode           : IGMP_ONLY
Last member query interval           : 100

```

This is an example of output from the **show ip igmp snooping** command. It displays snooping characteristics for all VLANs on the switch.

```

Switch# show ip igmp snooping
Global IGMP Snooping configuration:
-----
IGMP snooping                       : Enabled
IGMPv3 snooping (minimal)           : Enabled
Report suppression                   : Enabled
TCN solicit query                   : Disabled
TCN flood query count                : 2

Vlan 1:
-----
IGMP snooping                       : Enabled
IGMPv2 immediate leave              : Disabled
Explicit host tracking               : Enabled
Multicast router learning mode      : pim-dvmrp
CGMP interoperability mode          : IGMP_ONLY

Vlan 2:
-----
IGMP snooping                       : Enabled
IGMPv2 immediate leave              : Disabled
Explicit host tracking               : Enabled
Multicast router learning mode      : pim-dvmrp
CGMP interoperability mode          : IGMP_ONLY

Switch> show ip igmp snooping
Global IGMP Snooping configuration:
-----
IGMP snooping                       : Enabled
IGMPv3 snooping (minimal)           : Enabled
Report suppression                   : Enabled
TCN solicit query                   : Disabled
TCN flood query count                : 2

```



```

Last member query interval : 100

Vlan 1:
-----
IGMP snooping                :Enabled
Immediate leave              :Disabled
Multicast router learning mode :pim-dvmrp
Source only learning age timer :10
CGMP interoperability mode    :IGMP_ONLY
Last member query interval    : 100

Vlan 2:
-----
IGMP snooping                :Enabled
Immediate leave              :Disabled
Multicast router learning mode :pim-dvmrp
Source only learning age timer :10
CGMP interoperability mode    :IGMP_ONLY
Last member query interval    : 333

<output truncated>

```

**Related Commands**

Command	Description
<a href="#">ip igmp snooping</a>	Enables IGMP snooping on the switch or on a VLAN.
<a href="#">ip igmp snooping last-member-query-interval</a>	Enables the IGMP snooping configurable-leave timer.
<a href="#">ip igmp snooping querier</a>	Enables the IGMP querier function in Layer 2 networks.
<a href="#">ip igmp snooping report-suppression</a>	Enables IGMP report suppression.
<a href="#">ip igmp snooping tcn</a>	Configures the IGMP topology change notification behavior.
<a href="#">ip igmp snooping tcn flood</a>	Specifies multicast flooding as the IGMP spanning-tree topology change notification behavior.
<a href="#">ip igmp snooping vlan immediate-leave</a>	Enables IGMP snooping immediate-leave processing on a VLAN.
<a href="#">ip igmp snooping vlan mrouter</a>	Adds a multicast router port or configures the multicast learning method.
<a href="#">ip igmp snooping vlan static</a>	Statically adds a Layer 2 port as a member of a multicast group.
<a href="#">show ip igmp snooping groups</a>	Displays the IGMP snooping multicast table for the switch.
<a href="#">show ip igmp snooping mrouter</a>	Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN.
<a href="#">show ip igmp snooping querier</a>	Displays the configuration and operation information for the IGMP querier configured on a switch.

# show ip igmp snooping groups

Use the **show ip igmp snooping groups** privileged EXEC command to display the Internet Group Management Protocol (IGMP) snooping multicast table for the switch or the multicast information. Use with the **vlan** keyword to display the multicast table for a specified multicast VLAN or specific multicast information.

```
show ip igmp snooping groups [count | dynamic [count] | user [count]] [ | {begin | exclude | include} expression]
```

```
show ip igmp snooping groups vlan vlan-id [ip_address | count | dynamic [count] | user [count]] [ | {begin | exclude | include} expression]
```

## Syntax Description

<b>count</b>	(Optional) Display the total number of entries for the specified command options instead of the actual entries.
<b>dynamic</b>	(Optional) Display entries learned by IGMP snooping.
<b>user</b>	(Optional) Display only the user-configured multicast entries.
<i>ip_address</i>	(Optional) Display characteristics of the multicast group with the specified group IP address.
<b>vlan</b> <i>vlan-id</i>	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

Use this command to display multicast information or the multicast table.

VLAN IDs 1002 to 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in IGMP snooping.

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

**Examples**

This is an example of output from the **show ip igmp snooping groups** command without any keywords. It displays the multicast table for the switch.

```
Switch# show ip igmp snooping groups
Vlan      Group      Type      Version    Port List
-----
120       232.3.4.7    igmp      v3         Gi0/1921, Gi0/202
120       232.5.9.30   igmp      v3         Gi0/1921, Gi0/202
```

This is an example of output from the **show ip igmp snooping groups count** command. It displays the total number of multicast groups on the switch.

```
Switch# show ip igmp snooping groups count
Total number of multicast groups: 2
```

This is an example of output from the **show ip igmp snooping groups dynamic** command. It shows only the entries learned by IGMP snooping.

```
Switch# show ip igmp snooping groups vlan 1 dynamic
Vlan      Group      Type      Version    Port List
-----
104       224.1.4.2    igmp      v2         Gi0/21, Gi0/22
104       224.1.4.3    igmp      v2         Gi0/21, Gi0/22
```

This is an example of output from the **show ip igmp snooping groups vlan** *vlan-id ip-address* command. It shows the entries for the group with the specified IP address.

```
Switch# show ip igmp snooping groups vlan 104 224.1.4.2
Vlan      Group      Type      Version    Port List
-----
104       224.1.4.2    igmp      v2         Gi0/1, Fa1/0/15
104       224.1.4.2    igmp      v2         Gi0/21
```

**Related Commands**

Command	Description
<b>ip igmp snooping</b>	Enables IGMP snooping on the switch or on a VLAN.
<b>ip igmp snooping vlan mrouter</b>	Configures a multicast router port.
<b>ip igmp snooping vlan static</b>	Statically adds a Layer 2 port as a member of a multicast group.
<b>show ip igmp snooping</b>	Displays the IGMP snooping configuration of the switch or the VLAN.
<b>show ip igmp snooping mrouter</b>	Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN.

# show ip igmp snooping mrouter

Use the **show ip igmp snooping mrouter** privileged EXEC command to display the Internet Group Management Protocol (IGMP) snooping dynamically learned and manually configured multicast router ports for the switch or for the specified multicast VLAN.

```
show ip igmp snooping mrouter [vlan vlan-id] [ | {begin | exclude | include} expression]
```

Syntax Description	<b>vlan <i>vlan-id</i></b>	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.
	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	Privileged EXEC
---------------	-----------------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

Use this command to display multicast router ports on the switch or for a specific VLAN.

VLAN IDs 1002 to 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in IGMP snooping.

When multicast VLAN registration (MVR) is enabled, the **show ip igmp snooping mrouter** command displays MVR multicast router information and IGMP snooping information.

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

**Examples**

This is an example of output from the **show ip igmp snooping mrouter** command. It shows how to display multicast router ports on the switch.

```
Switch# show ip igmp snooping mrouter
Vlan      ports
----      -
1         Gi0/1 (dynamic)
```

**Related Commands**

Command	Description
<a href="#">ip igmp snooping</a>	Enables IGMP snooping on the switch or on a VLAN.
<a href="#">ip igmp snooping vlan mrouter</a>	Adds a multicast router port.
<a href="#">ip igmp snooping vlan static</a>	Statically adds a Layer 2 port as a member of a multicast group.
<a href="#">show ip igmp snooping</a>	Displays the IGMP snooping configuration of the switch or the VLAN
<a href="#">show ip igmp snooping groups</a>	Displays IGMP snooping multicast information for the switch or for the specified parameter.

# show ip igmp snooping querier

Use the **show ip igmp snooping querier detail** user EXEC command to display the configuration and operation information for the IGMP querier configured on a switch.

```
show ip igmp snooping querier [detail | vlan vlan-id [detail]] [ | { begin | exclude | include } expression]
```

Syntax Description		
<b>detail</b>		Optional) Display detailed IGMP querier information.
<b>vlan</b> <i>vlan-id</i> [ <b>detail</b> ]		Optional) Display IGMP querier information for the specified VLAN. The range is 1 to 1001 and 1006 to 4094. Use the <b>detail</b> keyword to display detailed information.
<b>  begin</b>		(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>		(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>		(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>		Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

Use the **show ip igmp snooping querier** command to display the IGMP version and the IP address of a detected device, also called a *querier*, that sends IGMP query messages. A subnet can have multiple multicast routers but has only one IGMP querier. In a subnet running IGMPv2, one of the multicast routers is elected as the querier. The querier can be a Layer 3 switch.

The **show ip igmp snooping querier** command output also shows the VLAN and the interface on which the querier was detected. If the querier is the switch, the output shows the *Port* field as *Router*. If the querier is a router, the output shows the port number on which the querier is learned in the *Port* field.

The **show ip igmp snooping querier detail** user EXEC command is similar to the **show ip igmp snooping querier** command. However, the **show ip igmp snooping querier** command displays only the device IP address most recently detected by the switch querier.

The **show ip igmp snooping querier detail** command displays the device IP address most recently detected by the switch querier and this additional information:

- The elected IGMP querier in the VLAN
- The configuration and operational information pertaining to the switch querier (if any) that is configured in the VLAN

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

**Examples**

This is an example of output from the **show ip igmp snooping querier** command:

```
Switch> show ip igmp snooping querier
Vlan      IP Address      IGMP Version      Port
-----
120       130.1.1.1       v3                Gi0/10
129       172.20.129.1    v2                Gi0/14
```

```
Switch> show ip igmp snooping querier
Vlan      IP Address      IGMP Version      Port
-----
1         172.20.50.11    v3                G0/1
2         172.20.40.20    v2                Router
```

This is an example of output from the **show ip igmp snooping querier detail** command:

```
Switch> show ip igmp snooping querier detail

Vlan      IP Address      IGMP Version      Port
-----
1         1.1.1.1         v2                Fa0/1

Global IGMP switch querier status
-----
admin state           : Enabled
admin version         : 2
source IP address     : 0.0.0.0
query-interval (sec)  : 60
max-response-time (sec) : 10
querier-timeout (sec) : 120
tcn query count       : 2
tcn query interval (sec) : 10

Vlan 1:  IGMP switch querier status
-----
elected querier is 1.1.1.1      on port Gi0/1
-----
admin state           : Enabled
admin version         : 2
source IP address     : 10.1.1.65
query-interval (sec)  : 60
max-response-time (sec) : 10
querier-timeout (sec) : 120
tcn query count       : 2
tcn query interval (sec) : 10
operational state     : Non-Querier
operational version   : 2
tcn query pending count : 0
```

**Related Commands**

Command	Description
<a href="#">ip igmp snooping</a>	Enables IGMP snooping on the switch or on a VLAN.
<a href="#">ip igmp snooping querier</a>	Enables the IGMP querier function in Layer 2 networks.
<a href="#">show ip igmp snooping</a>	Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN.

# show ip source binding

Use the **show ip source binding** user EXEC command to display the IP source bindings on the switch.

**show ip source binding** [*ip-address*] [*mac-address*] [**dhcp-snooping** | **static**] [**interface** *interface-id*] [**vlan** *vlan-id*] [ | **begin** | **exclude** | **include** } *expression*]

This command is available only if your switch is running the IP services image, formerly known as the enhanced multilayer image (EMI).

## Syntax Description

<i>ip-address</i>	(Optional) Display IP source bindings for a specific IP address.
<i>mac-address</i>	(Optional) Display IP source bindings for a specific MAC address.
<b>dhcp-snooping</b>	(Optional) Display IP source bindings that were learned by DHCP snooping.
<b>static</b>	(Optional) Display static IP source bindings.
<b>interface</b> <i>interface-id</i>	(Optional) Display IP source bindings on a specific interface.
<b>vlan</b> <i>vlan-id</i>	(Optional) Display IP source bindings on a specific VLAN.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(20)SE	This command was introduced.

## Usage Guidelines

The **show ip source binding** command output shows the dynamically and statically configured bindings in the DHCP snooping binding database. Use the **show ip dhcp snooping binding** privileged EXEC command to display only the dynamically configured bindings.

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

## Examples

This is an example of output from the **show ip source binding** command:

```
Switch> show ip source binding
MacAddress      IpAddress      Lease(sec)  Type           VLAN  Interface
-----
00:00:00:0A:00:0B  11.0.0.1      infinite   static         10    GigabitEthernet0/1
00:00:00:0A:00:0A  11.0.0.2      10000     dhcp-snooping  10    GigabitEthernet0/1
```



Related Commands	Command	Description
	<a href="#">ip dhcp snooping binding</a>	Configures the DHCP snooping binding database.
	<a href="#">ip source binding</a>	Configures static IP source bindings on the switch.

# show ip verify source

Use the **show ip verify source** user EXEC command to display the IP source guard configuration on the switch or on a specific interface.

**show ip verify source** [**interface** *interface-id*] [**|** { **begin** | **exclude** | **include** } *expression*]

## Syntax Description

<b>interface</b> <i>interface-id</i>	(Optional) Display IP source guard configuration on a specific interface.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	This command was introduced.

## Usage Guidelines

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

## Examples

This is an example of output from the **show ip verify source** command:

```
Switch> show ip verify source
Interface  Filter-type  Filter-mode  IP-address  Mac-address  Vlan
-----
gi0/1     ip           active       10.0.0.1    -----
gi0/1     ip           active       deny-all   -----
gi0/2     ip           inactive-trust-port
gi0/3     ip           inactive-no-snooping-vlan
gi0/4     ip-mac       active       10.0.0.2    aaaa.bbbb.cccc  10
gi0/4     ip-mac       active       11.0.0.1    aaaa.bbbb.cccd  11
gi0/4     ip-mac       active       deny-all   deny-all       12-20
gi0/5     ip-mac       active       10.0.0.3    permit-all     10
gi0/5     ip-mac       active       deny-all   permit-all     11-20
```

In the previous example, this is the IP source guard configuration:

- On the Gigabit Ethernet 0/1 interface, DHCP snooping is enabled on VLANs 10 to 20. For VLAN 10, IP source guard with IP address filtering is configured on the interface, and a binding exists on the interface. For VLANs 11 to 20, the second entry shows that a default port access control lists (ACLs) is applied on the interface for the VLANs on which IP source guard is not configured.
- The Gigabit Ethernet 0/2 interface is configured as trusted for DHCP snooping.
- On the Gigabit Ethernet 0/3 interface, DHCP snooping is not enabled on the VLANs to which the interface belongs.

- On the Gigabit Ethernet 0/4 interface, IP source guard with source IP and MAC address filtering is enabled, and static IP source bindings are configured on VLANs 10 and 11. For VLANs 12 to 20, the default port ACL is applied on the interface for the VLANs on which IP source guard is not configured.
- On the Gigabit Ethernet 0/5 interface, IP source guard with source IP and MAC address filtering is enabled and configured with a static IP binding, but port security is disabled. The switch cannot filter source MAC addresses.

This is an example of output on an interface on which IP source guard is disabled:

```
Switch> show ip verify source gigabitethernet0/6
IP source guard is not configured on the interface gi0/6.
```

#### Related Commands

Command	Description
<a href="#">ip verify source</a>	Enables IP source guard on an interface.

# show ipc

Use the **show ipc** user EXEC command to display Interprocess Communications Protocol (IPC) configuration, status, and statistics on a switch.

```
show ipc {mcast {appclass | groups | status} | nodes | ports [open] | queue | rpc | session {all | rx | tx} [verbose] | status [cumulative] | zones} [ | {begin | exclude | include} expression]
```

## Syntax Description

<b>mcast {appclass   groups   status}</b>	Display the IPC multicast routing information. The keywords have these meanings: <ul style="list-style-type: none"> <li><b>appclass</b>—Display the IPC multicast application classes.</li> <li><b>groups</b>—Display the IPC multicast groups.</li> <li><b>status</b>—Display the IPC multicast routing status.</li> </ul>
<b>nodes</b>	Display participating nodes.
<b>ports [open]</b>	Display local IPC ports. The keyword has this meaning: <ul style="list-style-type: none"> <li><b>open</b>—(Optional) Display only the open ports.</li> </ul>
<b>queue</b>	Display the contents of the IPC transmission queue.
<b>rpc</b>	Display the IPC remote-procedure statistics.
<b>session {all   rx   tx}</b>	Display the IPC session statistics (available only in privileged EXEC mode). The keywords have these meanings: <ul style="list-style-type: none"> <li><b>all</b>—Display all the session statistics.</li> <li><b>rx</b>—Display the sessions statistics for traffic that the switch receives</li> <li><b>tx</b>—Display the sessions statistics for traffic that the switch forwards.</li> </ul>
<b>verbose</b>	(Optional) Display detailed statistics (available only in privileged EXEC mode).
<b>status [cumulative]</b>	Display the status of the local IPC server. The keyword has this meaning: <ul style="list-style-type: none"> <li><b>cumulative</b>—(Optional) Display the status of the local IPC server since the switch was started or restarted.</li> </ul>
<b>zones</b>	Display the participating IPC zones. The switch supports a single IPC zone.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	The command was introduced.

## Usage Guidelines

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

## Examples

This example shows how to display the IPC routing status:

```
Switch> show ipc mcast status
```

IPC Mcast Status		Tx	Rx
Total Frames		0	0
Total control Frames		0	0
Total Frames dropped		0	0
Total control Frames dropped		0	0
Total Reliable messages		0	0
Total Reliable messages acknowledged		0	0
Total Out of Band Messages		0	0
Total Out of Band messages acknowledged		0	0
Total No Mcast groups		0	0
Total Retries	0	Total Timeouts	0
Total OOB Retries	0	Total OOB Timeouts	0
Total flushes	0	Total No ports	0

This example shows how to display the participating nodes:

```
Switch> show ipc nodes
```

There is 1 node in this IPC realm.

ID	Type	Name	Last Sent	Last Heard
10000	Local	IPC Master	0	0

This example shows how to display the local IPC ports:

```
Switch> show ipc ports
```

There are 8 ports defined.

Port ID	Type	Name	(current/peak/total)
There are 8 ports defined.			
10000.1	unicast	IPC Master:Zone	
10000.2	unicast	IPC Master:Echo	
10000.3	unicast	IPC Master:Control	
10000.4	unicast	IPC Master:Init	
10000.5	unicast	FIB Master:DFS.process_level.msgs	
10000.6	unicast	FIB Master:DFS.interrupt.msgs	
10000.7	unicast	MDFS RP:Statistics	
port_index = 0 seat_id = 0x10000 last sent = 0 last heard = 0			
0/2/159			
10000.8	unicast	Slot 1 :MDFS.control.RIL	
port_index = 0 seat_id = 0x10000 last sent = 0 last heard = 0			
0/0/0			
RPC packets:current/peak/total			
0/1/4			

This example shows how to display the contents of the IPC retransmission queue:

```
Switch> show ipc queue
There are 0 IPC messages waiting for acknowledgement in the transmit queue.
There are 0 IPC messages waiting for a response.
There are 0 IPC messages waiting for additional fragments.
There are 0 IPC messages currently on the IPC inboundQ.
Messages currently in use                :      3
Message cache size                      :    1000
Maximum message cache usage             :    1000

0 times message cache crossed          5000 [max]

Emergency messages currently in use      :      0

There are 2 messages currently reserved for reply msg.

Inbound message queue depth 0
Zone inbound message queue depth 0
```

This example shows how to display all the IPC session statistics:

```
Switch# show ipc session all
Tx Sessions:
Port ID      Type      Name
10000.7      Unicast   MDFS RP:Statistics
    port_index = 0  type = Unreliable    last sent = 0    last heard = 0
    Msgs requested = 180  Msgs returned = 180

10000.8      Unicast   Slot 1 :MDFS.control.RIL
    port_index = 0  type = Reliable      last sent = 0    last heard = 0
    Msgs requested = 0   Msgs returned = 0

Rx Sessions:
Port ID      Type      Name
10000.7      Unicast   MDFS RP:Statistics
    port_index = 0  seat_id = 0x10000    last sent = 0    last heard = 0
    No of msgs requested = 180  Msgs returned = 180

10000.8      Unicast   Slot 1 :MDFS.control.RIL
    port_index = 0  seat_id = 0x10000    last sent = 0    last heard = 0
    No of msgs requested = 0    Msgs returned = 0
```

This example shows how to display the status of the local IPC server:

```
Switch> show ipc status cumulative
IPC System Status

Time last IPC stat cleared :never

This processor is the IPC master server.
Do not drop output of IPC frames for test purposes.

1000 IPC Message Headers Cached.

Rx Side      Tx Side
Total Frames      12916      608
0                0
Total from Local Ports      13080      574
Total Protocol Control Frames      116      17
Total Frames Dropped      0      0

Service Usage
```

```

Total via Unreliable Connection-Less Service      12783      171
Total via Unreliable Sequenced Connection-Less Svc      0          0
Total via Reliable Connection-Oriented Service      17         116
<output truncated>

```

#### Related Commands

Command	Description
<a href="#">clear ipc</a>	Clears the IPC multicast routing statistics.

# show ipv6 access-list

Use the **show ipv6 access-list** user EXEC command to display the contents of all current IPv6 access lists.

```
show ipv6 access-list [access-list-name]
```

  
**Note**

This command is available only if the switch stack is running the advanced IP services image and you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

Syntax Description	<i>access-list-name</i> (Optional) Name of access list.
--------------------	---

Command Modes	User EXEC
---------------	-----------

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>12.2(44)SE</td><td>This command was introduced.</td></tr></table>	Release	Modification	12.2(44)SE	This command was introduced.
Release	Modification				
12.2(44)SE	This command was introduced.				

**Usage Guidelines**

The **show ipv6 access-list** command provides output similar to the **show ip access-list** command, except that it is IPv6-specific.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6 { default | vlan }** global configuration command and reload the switch.

**Examples**

The following output from the **show ipv6 access-list** command shows IPv6 access lists named inbound and outbound:

```
Router# show ipv6 access-list
IPv6 access list inbound
  permit tcp any any eq bgp (8 matches) sequence 10
  permit tcp any any eq telnet (15 matches) sequence 20
  permit udp any any sequence 30
```

Table 2-27 describes the significant fields shown in the display.

Table 2-27 show ipv6 access-list Field Descriptions

Field	Description
IPv6 access list inbound	Name of the IPv6 access list, for example, inbound.
permit	Permits any packet that matches the specified protocol type.
tcp	Transmission Control Protocol. The higher-level (Layer 4) protocol type that the packet must match.
any	Equal to ::/0.



**Table 2-27** *show ipv6 access-list Field Descriptions (continued)*

Field	Description
eq	An equal operand that compares the source or destination ports of TCP or UDP packets.
bgp (matches)	Border Gateway Protocol. The protocol type that the packet is equal to and the number of matches.
sequence 10	Sequence in which an incoming packet is compared to lines in an access list. Access list lines are ordered from first priority (lowest number, for example, 10) to last priority (highest number, for example, 80).

#### Related Commands

Command	Description
<b>clear ipv6 access-list</b>	Resets the IPv6 access list match counters.
<b>ipv6 access-list</b>	Defines an IPv6 access list and puts the switch into IPv6 access-list configuration mode.
<b>sdm prefer</b>	Configures an SDM template to optimize system resources based on how the switch is being used.

# show ipv6 mld snooping

Use the **show ipv6 mld snooping** user EXEC command to display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping configuration of the switch or the VLAN.

**show ipv6 mld snooping** [**vlan** *vlan-id*] [ | { **begin** | **exclude** | **include** } *expression*]



## Note

This command is available only if you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Syntax Description

<b>vlan</b> <i>vlan-id</i>	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	This command was introduced.

## Usage Guidelines

Use this command to display MLD snooping configuration for the switch or for a specific VLAN.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6 { default | vlan }** global configuration command and reload the switch.

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

## Examples

This is an example of output from the **show ipv6 mld snooping vlan** command. It shows snooping characteristics for a specific VLAN.

```
Switch> show ipv6 mld snooping vlan 100
Global MLD Snooping configuration:
```

```
-----
MLD snooping                : Enabled
MLDv2 snooping (minimal)    : Enabled
Listener message suppression : Enabled
TCN solicit query           : Disabled
TCN flood query count        : 2
Robustness variable          : 3
Last listener query count     : 2
Last listener query interval : 1000
```

```
Vlan 100:
-----
MLD snooping                : Disabled
MLDv1 immediate leave       : Disabled
Explicit host tracking       : Enabled
Multicast router learning mode : pim-dvmrp
Robustness variable         : 3
Last listener query count    : 2
Last listener query interval : 1000
```

This is an example of output from the **show ipv6 mld snooping** command. It displays snooping characteristics for all VLANs on the switch.

```
Switch> show ipv6 mld snooping
Global MLD Snooping configuration:
-----
MLD snooping                : Enabled
MLDv2 snooping (minimal)    : Enabled
Listener message suppression : Enabled
TCN solicit query           : Disabled
TCN flood query count       : 2
Robustness variable         : 3
Last listener query count    : 2
Last listener query interval : 1000
```

```
Vlan 1:
-----
MLD snooping                : Disabled
MLDv1 immediate leave       : Disabled
Explicit host tracking       : Enabled
Multicast router learning mode : pim-dvmrp
Robustness variable         : 1
Last listener query count    : 2
Last listener query interval : 1000
```

<output truncated>

```
Vlan 951:
-----
MLD snooping                : Disabled
MLDv1 immediate leave       : Disabled
Explicit host tracking       : Enabled
Multicast router learning mode : pim-dvmrp
Robustness variable         : 3
Last listener query count    : 2
Last listener query interval : 1000
```

## Related Commands

Command	Description
<a href="#">ipv6 mld snooping</a>	Enables and configures MLD snooping on the switch or on a VLAN.
<a href="#">sdm prefer</a>	Configures an SDM template to optimize system resources based on how the switch is being used.

# show ipv6 mld snooping address

Use the **show ipv6 mld snooping address** user EXEC command to display all or specified IP version 6 (IPv6) multicast address information maintained by Multicast Listener Discovery (MLD) snooping.

```
show ipv6 mld snooping address [[vlan vlan-id] [ipv6 address]] [vlan vlan-id] [count | dynamic
| user] [ | {begin | exclude | include} expression]
```



## Note

This command is available only you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Syntax Description

<b>vlan</b> <i>vlan-id</i>	(Optional) Specify a VLAN about which to show MLD snooping multicast address information. The VLAN ID range is 1 to 1001 and 1006 to 4094.
<i>ipv6-multicast-address</i>	(Optional) Display information about the specified IPv6 multicast address. This keyword is only available when a VLAN ID is entered.
<b>count</b>	(Optional) Display the number of multicast groups on the switch or in the specified VLAN.
<b>dynamic</b>	(Optional) Display MLD snooping learned group information.
<b>user</b>	(Optional) Display MLD snooping user-configured group information.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	This command was introduced.

## Usage Guidelines

Use this command to display IPv6 multicast address information.

You can enter an IPv6 multicast address only after you enter a VLAN ID.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

Use the **dynamic** keyword to display information only about groups that are learned. Use the **user** keyword to display information only about groups that have been configured.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6 {default | vlan}** global configuration command and reload the switch.

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

## Examples

This is an example of output from the **show snooping address user EXEC** command:

Switch> **show ipv6 mld snooping address**

```
Vlan Group   Type Version Port List
-----
2      FF12::3 user          Fa0/2, Gi0/2, Gi0/1,Gi0/3
```

This is an example of output from the **show snooping address count user EXEC** command:

Switch> **show ipv6 mld snooping address count**  
Total number of multicast groups: 2

This is an example of output from the **show snooping address user user EXEC** command:

```
Switch> show ipv6 mld snooping address user
Vlan Group   Type Version Port List
-----
2      FF12::3 user   v2      Fa0/2, Gi0/2, Gi0/1,Gi0/3
```

## Related Commands

Command	Description
<a href="#">ipv6 mld snooping vlan</a>	Configures IPv6 MLD snooping on a VLAN.
<a href="#">sdm prefer</a>	Configures an SDM template to optimize system resources based on how the switch is being used.

# show ipv6 mld snooping mrouter

Use the **show ipv6 mld snooping mrouter** user EXEC command to display dynamically learned and manually configured IP version 6 (IPv6) Multicast Listener Discovery (MLD) router ports for the switch or a VLAN.

**show ipv6 mld snooping mrouter** [**vlan** *vlan-id*] [ **|** { **begin** | **exclude** | **include** } *expression*]



## Note

This command is available only if the switch stack is running the advanced IP services image and you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Syntax Description

<b>vlan</b> <i>vlan-id</i>	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	This command was introduced.

## Usage Guidelines

Use this command to display MLD snooping router ports for the switch or for a specific VLAN.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6 {default | vlan}** global configuration command and reload the switch.

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

## Examples

This is an example of output from the **show ipv6 mld snooping mrouter** command. It displays snooping characteristics for all VLANs on the switch that are participating in MLD snooping.

```
Switch> show ipv6 mld snooping mrouter
Vlan      ports
----      -
    2      Gi0/11(dynamic)
   72      Gi0/11(dynamic)
  200      Gi0/11(dynamic)
```

This is an example of output from the **show ipv6 mld snooping mrouter vlan** command. It shows multicast router ports for a specific VLAN.

```
Switch> show ipv6 mld snooping mrouter vlan 100
Vlan      ports
----      -
      2    Gi0/11 (dynamic)
```

Related Commands	Command	Description
	<b>ipv6 mld snooping</b>	Enables and configures MLD snooping on the switch or on a VLAN.
	<b>ipv6 mld snooping vlan mrouter interface</b> <i>interface-id</i>   <b>static</b> <i>ipv6-multicast-address</i> <b>interface</b> <i>interface-id</i> ]	Configures multicast router ports for a VLAN.
	<b>sdm prefer</b>	Configures an SDM template to optimize system resources based on how the switch is being used.

# show ipv6 mld snooping querier

Use the **show ipv6 mld snooping querier** user EXEC command to display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping querier-related information most recently received by the switch or the VLAN.

**show ipv6 mld snooping querier** [**vlan** *vlan-id*] [**detail**] [ | { **begin** | **exclude** | **include** } *expression*]



## Note

This command is available only if you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Syntax Description

<b>vlan</b> <i>vlan-id</i>	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.
<b>detail</b>	(Optional) Display MLD snooping detailed querier information for the switch or for the VLAN.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(44)SE	This command was introduced.

## Usage Guidelines

Use the **show ipv6 mld snooping querier** command to display the MLD version and IPv6 address of a detected device that sends MLD query messages, which is also called a *querier*. A subnet can have multiple multicast routers but has only one MLD querier. The querier can be a Layer 3 switch.

The **show ipv6 mld snooping querier** command output also shows the VLAN and interface on which the querier was detected. If the querier is the switch, the output shows the *Port* field as *Router*. If the querier is a router, the output shows the port number on which the querier is learned in the *Port* field.

The output of the **show ipv6 mld snoop querier vlan** command displays the information received in response to a query message from an external or internal querier. It does not display user-configured VLAN values, such as the snooping robustness variable on the particular VLAN. This querier information is used only on the MASQ message that is sent by the switch. It does not override the user-configured robustness variable that is used for aging out a member that does not respond to query messages.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6 {default | vlan}** global configuration command and reload the switch.



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

### Examples

This is an example of output from the **show ipv6 mld snooping querier** command:

```
Switch> show ipv6 mld snooping querier
Vlan      IP Address      MLD Version Port
-----
2         FE80::201:C9FF:FE40:6000 v1      Gi3/0/1
```

This is an example of output from the **show ipv6 mld snooping querier detail** command:

```
Switch> show ipv6 mld snooping querier detail
Vlan      IP Address      MLD Version Port
-----
2         FE80::201:C9FF:FE40:6000 v1      Gi0/1
```

This is an example of output from the **show ipv6 mld snooping querier vlan** command:

```
Switch> show ipv6 mld snooping querier vlan 2
IP address : FE80::201:C9FF:FE40:6000
MLD version : v1
Port : Gi0/1
Max response time : 1000s
```

### Related Commands

Command	Description
<a href="#">ipv6 mld snooping</a>	Enables and configures IPv6 MLD snooping on the switch or on a VLAN.
<a href="#">ipv6 mld snooping last-listener-query-count</a>	Configures the maximum number of queries that the switch sends before aging out an MLD client.
<a href="#">ipv6 mld snooping last-listener-query-interval</a>	Configures the maximum response time after sending out a query that the switch waits before deleting a port from the multicast group.
<a href="#">ipv6 mld snooping robustness-variable</a>	Configures the maximum number of queries that the switch sends before aging out a multicast address when there is no response.
<a href="#">sdm prefer</a>	Configures an SDM template to optimize system resources based on how the switch is being used.
<a href="#">ipv6 mld snooping</a>	Enables and configures IPv6 MLD snooping on the switch or on a VLAN.

# show l2protocol-tunnel

Use the **show l2protocol-tunnel** user EXEC command to display information about Layer 2 protocol tunnel ports. Displays information for interfaces with protocol tunneling enabled.

```
show l2protocol-tunnel [interface interface-id] [summary] [ | {begin | exclude | include}
expression]
```

Syntax Description

<b>interface</b> <i>interface-id</i>	(Optional) Specify the interface for which protocol tunneling information appears. Valid interfaces are physical ports and port channels; the port channel range is 1 to 12.
<b>summary</b>	(Optional) Display only Layer 2 protocol summary information.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes

User EXEC

Command History

Release	Modification
12.2(44)SE	This command was introduced.
12.2(50)SE	The port channel range is incorrect. The correct range is from 1 to 12.

Usage Guidelines

After enabling Layer 2 protocol tunneling on an access or IEEE 802.1Q tunnel port by using the **l2protocol-tunnel** interface configuration command, you can configure some or all of these parameters:

- Protocol type to be tunneled
- Shutdown threshold
- Drop threshold

If you enter the **show l2protocol-tunnel [interface interface-id]** command, only information about the active ports on which all the parameters are configured appears.

If you enter the **show l2protocol-tunnel summary** command, only information about the active ports on which some or all of the parameters are configured appears.

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

**Examples**

This is an example of output from the **show l2protocol-tunnel** command:

```
Switch> show l2protocol-tunnel
```

```
COS for Encapsulated Packets: 5
```

```
Drop Threshold for Encapsulated Packets: 0
```

Port	Protocol	Shutdown Threshold	Drop Threshold	Encapsulation Counter	Decapsulation Counter	Drop Counter
Fa0/3	---	----	----	----	----	----
	---	----	----	----	----	----
	---	----	----	----	----	----
	pagp	----	----	0	242500	
	lacp	----	----	24268	242640	
Fa0/4	udld	----	----	0	897960	
	---	----	----	----	----	----
	---	----	----	----	----	----
	pagp	1000	----	24249	242700	
	lacp	----	----	24256	242660	
Gi0/13	udld	----	----	0	897960	
	cdp	----	----	134482	1344820	
	---	----	----	----	----	----
	---	----	----	----	----	----
	pagp	1000	----	0	242500	
Gi0/24	lacp	500	----	0	485320	
	udld	300	----	44899	448980	
	cdp	----	----	134482	1344820	
	---	----	----	----	----	----
	---	----	----	----	----	----
	pagp	----	1000	0	242700	
	lacp	----	----	0	485220	
	udld	300	----	44899	448980	

This is an example of output from the **show l2protocol-tunnel summary** command:

```
Switch> show l2protocol-tunnel summary
```

```
COS for Encapsulated Packets: 5
```

```
Drop Threshold for Encapsulated Packets: 0
```

Port	Protocol	Shutdown Threshold (cdp/stp/vtp) (pagp/lacp/udld)	Drop Threshold (cdp/stp/vtp) (pagp/lacp/udld)	Status
Fa0/2	---	----/----/----	----/----/----	up
	pagp lacp udld	----/----/----	----/----/----	
Fa0/3	---	----/----/----	----/----/----	up
	pagp lacp udld	1000/----/----	----/----/----	
Fa0/4	---	----/----/----	----/----/----	up
	pagp lacp udld	1000/ 500/----	----/----/----	
Fa0/5	cdp stp vtp	----/----/----	----/----/----	down
	---	----/----/----	----/----/----	
Gi0/1	---	----/----/----	----/----/----	down
	pagp	----/----/----	1000/----/----	
Gi0/2	---	----/----/----	----/----/----	down
	pagp	----/----/----	1000/----/----	

■ show l2protocol-tunnel

Related Commands

Command	Description
<a href="#">clear l2protocol-tunnel counters</a>	Clears counters for protocol tunneling ports.
<a href="#">l2protocol-tunnel</a>	Enables Layer 2 protocol tunneling for CDP, STP, or VTP packets on an interface.
<a href="#">l2protocol-tunnel cos</a>	Configures a class of service (CoS) value for tunneled Layer 2 protocol packets.

# show lacp

Use the **show lacp** user EXEC command to display Link Aggregation Control Protocol (LACP) channel-group information.

```
show lacp [channel-group-number] { counters | internal | neighbor | sys-id } [ | { begin | exclude | include } expression]
```

Syntax Description	
<i>channel-group-number</i>	(Optional) Number of the channel group. The range is 1 to 12.
<b>counters</b>	Display traffic information.
<b>internal</b>	Display internal information.
<b>neighbor</b>	Display neighbor information.
<b>sys-id</b>	Display the system identifier that is being used by LACP. The system identifier is made up of the LACP system priority and the switch MAC address.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.
	12.2(50)SE	The <i>channel-group-number</i> range was incorrect. The correct range is from 1 to 12.

**Usage Guidelines** You can enter any **show lacp** command to display the active channel-group information. To display specific channel information, enter the **show lacp** command with a channel-group number.

If you do not specify a channel group, information for all channel groups appears.

You can enter the *channel-group-number* option to specify a channel group for all keywords except **sys-id**.

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

**Examples** This is an example of output from the **show lacp counters** user EXEC command.

```
Switch> show lacp counters
          LACPDUs          Marker          Marker Response          LACPDUs
Port      Sent  Recv      Sent   Recv      Sent   Recv      Pkts Err
-----
Channel group:1
```

■ **show lacp**

```

Gi0/11      19      10      0      0      0      0      0
Gi0/12      14       6      0      0      0      0      0

```

Table 2-28 describes the fields in the display.

**Table 2-28** *show lacp counters Field Descriptions*

Field	Description
LACPDUs Sent and Recv	The number of LACP packets sent and received by a port.
Marker Sent and Recv	The number of LACP marker packets sent and received by a port.
Marker Response Sent and Recv	The number of LACP marker response packets sent and received by a port.
LACPDUs Pkts and Err	The number of unknown and illegal packets received by LACP for a port.

This is an example of output from the **show lacp internal** command:

```

Switch> show lacp 1 internal
Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode           P - Device is in Passive mode

Channel group 1

Port      Flags   State      LACP port   Admin   Oper   Port   Port
Port      Flags   State      Priority    Key     Key    Number State
Gi0/11    SA      bndl      32768      0x3     0x3    0x4    0x3D
Gi0/12    SA      bndl      32768      0x3     0x3    0x5    0x3D

```

Table 2-29 describes the fields in the display:

**Table 2-29** *show lacp internal Field Descriptions*

Field	Description
State	<p>State of the specific port. These are the allowed values:</p> <ul style="list-style-type: none"> <li>—Port is in an unknown state.</li> <li><b>bndl</b>—Port is attached to an aggregator and bundled with other ports.</li> <li><b>susp</b>—Port is in a suspended state; it is not attached to any aggregator.</li> <li><b>hot-sby</b>—Port is in a hot-standby state.</li> <li><b>indiv</b>—Port is incapable of bundling with any other port.</li> <li><b>indep</b>—Port is in an independent state (not bundled but able to switch data traffic. In this case, LACP is not running on the partner port).</li> <li><b>down</b>—Port is down.</li> </ul>
LACP Port Priority	Port priority setting. LACP uses the port priority to put ports in standby mode when there is a hardware limitation that prevents all compatible ports from aggregating.

**Table 2-29** *show lacp internal Field Descriptions (continued)*

Field	Description
Admin Key	Administrative key assigned to this port. LACP automatically generates an administrative key value as a hexadecimal number. The administrative key defines the ability of a port to aggregate with other ports. A port's ability to aggregate with other ports is determined by the port physical characteristics (for example, data rate and duplex capability) and configuration restrictions that you establish.
Oper Key	Runtime operational key that is being used by this port. LACP automatically generates this value as a hexadecimal number.
Port Number	Port number.
Port State	<p>State variables for the port, encoded as individual bits within a single octet with these meanings:</p> <ul style="list-style-type: none"> <li>• bit0: LACP_Activity</li> <li>• bit1: LACP_Timeout</li> <li>• bit2: Aggregation</li> <li>• bit3: Synchronization</li> <li>• bit4: Collecting</li> <li>• bit5: Distributing</li> <li>• bit6: Defaulted</li> <li>• bit7: Expired</li> </ul> <p><b>Note</b> In the list above, bit7 is the MSB and bit0 is the LSB.</p>

This is an example of output from the **show lacp neighbor** command:

```
Switch> show lacp neighbor
```

```
Flags: S - Device is sending Slow LACPDUs F - Device is sending Fast LACPDUs
      A - Device is in Active mode      P - Device is in Passive mode
```

```
Channel group 3 neighbors
```

```
Partner's information:
```

Port	Partner System ID	Partner Port Number	Age	Partner Flags
Gi0/1	32768,0007.eb49.5e80	0xC	19s	SP
Gi0/11	32768,0007.eb49.5e80	0xC	19s	SP
	LACP Partner	Partner	Partner	
	Port Priority	Oper Key	Port State	
	32768	0x3	0x3C	

```
Partner's information:
```

Port	Partner System ID	Partner Port Number	Age	Partner Flags
Gi0/2	32768,0007.eb49.5e80	0xD	15s	SP
Gi0/12	32768,0007.eb49.5e80	0xD	15s	SP

show lacp

LACP Partner	Partner	Partner
Port Priority	Oper Key	Port State
32768	0x3	0x3C

This is an example of output from the **show lacp sys-id** command:

```
Switch> show lacp sys-id
32765,0002.4b29.3a00
```

The system identification is made up of the system priority and the system MAC address. The first two bytes are the system priority, and the last six bytes are the globally administered individual MAC address associated to the system.

Related Commands

Command	Description
<a href="#">clear ip dhcp snooping</a>	Clears the LACP channel-group information.
<a href="#">lacp port-priority</a>	Configures the LACP port priority.
<a href="#">lacp system-priority</a>	Configures the LACP system priority.



# show location

Use the **show location** user EXEC command to display location information for an endpoint.

**show location admin-tag** [ **|** { **begin** | **exclude** | **include** } *expression* ]

**show location civic-location** { **identifier** *id number* | **interface** *interface-id* | **static** } [ { **begin** | **exclude** | **include** } *expression* ]

**show location elin-location** { **identifier** *id number* | **interface** *interface-id* | **static** } [ { **begin** | **exclude** | **include** } *expression* ]

Syntax Description		
<b>admin-tag</b>		Display administrative tag or site information.
<b>civic-location</b>		Display civic location information.
<b>elin-location</b>		Display emergency location information (ELIN).
<b>identifier</b> <i>id</i>		Specify the ID for the civic location or the elin location. The id range is 1 to 4095.
<b>interface</b> <i>interface-id</i>		(Optional) Display location information for the specified interface or all interfaces. Valid interfaces include physical ports.
<b>static</b>		Display static configuration information.
<b>  begin</b>		(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>		(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>		(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>		Expression in the output to use as a reference point.

**Command Modes** User EXEC

Command History	Release	Modification
	12.2(44)SE	This command was introduced.

**Usage Guidelines** Use the **show location** command to display location information for an endpoint.

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

**Examples**

This is an example of output from the **show location civic-location** command that displays location information for an interface:

```
Switch> show location civic interface gigabitethernet0/1
Civic location information
-----
Identifier           : 1
County               : Santa Clara
Street number        : 3550
Building             : 19
Room                 : C6
Primary road name     : Cisco Way
City                 : San Jose
State                : CA
Country              : US
```

This is an example of output from the **show location civic-location** command that displays all the civic location information:

```
Switch> show location civic-location static
Civic location information
-----
Identifier           : 1
County               : Santa Clara
Street number        : 3550
Building             : 19
Room                 : C6
Primary road name     : Cisco Way
City                 : San Jose
State                : CA
Country              : US
Ports                : Gi0/1
-----
Identifier           : 2
Street number        : 24568
Street number suffix : West
Landmark             : Golden Gate Bridge
Primary road name     : 19th Ave
City                 : San Francisco
Country              : US
-----
```

This is an example of output from the **show location elin-location** command that displays the emergency location information:

```
Switch> show location elin-location identifier 1
Elin location information
-----
Identifier : 1
Elin       : 14085553881
Ports      : Gi0/2
```

This is an example of output from the **show location elin static** command that displays all emergency location information:

```
Switch> show location elin static
Elin location information
-----
Identifier : 1
Elin       : 14085553881
Ports      : Gi0/2
-----
Identifier : 2
Elin       : 18002228999
-----
```

# show link state group

Use the **show link state group** privileged EXEC command to display the link-state group information.

```
show link state group [number] [detail] [ | {begin | exclude | include} expression]
```

Syntax Description	<i>number</i>	(Optional) Number of the link-state group.
	<b>detail</b>	(Optional) Specify that detailed information appears.
	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

**Defaults** There is no default.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	12.2(44)SE	This command was introduced.

**Usage Guidelines**

Use the **show link state group** command to display the link-state group information. Enter this command without keywords to display information about all link-state groups. Enter the group number to display information specific to the group.

Enter the **detail** keyword to display detailed information about the group. The output for the **show link state group detail** command displays only those link-state groups that have link-state tracking enabled or that have upstream or downstream interfaces (or both) configured. If there is no link-state group configuration for a group, it is not shown as enabled or disabled.

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** This is an example of output from the **show link state group 1** command:

```
Switch> show link state group 1
Link State Group: 1      Status: Enabled, Down
```

This is an example of output from the **show link state group detail** command:

```
Switch> show link state group detail
(Up):Interface up    (Dwn):Interface Down    (Dis):Interface disabled

Link State Group: 1 Status: Enabled, Down
Upstream Interfaces : Gi0/15(Dwn) Gi0/16(Dwn)
Downstream Interfaces : Gi0/11(Dis) Gi0/12(Dis) Gi0/13(Dis) Gi0/14(Dis)

Link State Group: 2 Status: Enabled, Down
Upstream Interfaces : Gi0/15(Dwn) Gi0/16(Dwn) Gi0/17(Dwn)
Downstream Interfaces : Gi0/11(Dis) Gi0/12(Dis) Gi0/13(Dis) Gi0/14(Dis)

(Up):Interface up (Dwn):Interface Down (Dis):Interface disabled
```

## Related Commands

Command	Description
<a href="#">link state group</a>	Configures an interface as a member of a link-state group.
<a href="#">link state track</a>	Enables a link-state group.
<b>show running-config</b>	Displays the current operating configuration. For syntax information, select <b>Cisco IOS Configuration Fundamentals Command Reference for Release 12.2 &gt; Cisco IOS File Management Commands &gt; Configuration File Commands</b> .

# show link state group

Use the **show link state group** global configuration command to display the link-state group information.

```
show link state group [number] [detail]
```

Syntax Description	<i>number</i>	(Optional) Number of the link-state group.
	<b>detail</b>	(Optional) Specify that detailed information appears.

Defaults	There is no default.
----------	----------------------

Command Modes	Privileged EXEC
---------------	-----------------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

Use the **show link state group** command to display the link-state group information. Enter this command without keywords to display information about all link-state groups. Enter the group number to display information specific to the group.

Enter the **detail** keyword to display detailed information about the group. The output for the **show link state group detail** command displays only those link-state groups that have link-state tracking enabled or that have upstream or downstream interfaces (or both) configured. If there is no link-state group configuration for a group, it is not shown as enabled or disabled.

**Examples**

This is an example of output from the **show link state group 1** command:

```
Switch> show link state group 1

Link State Group: 1      Status: Enabled, Up
```

This is an example of output from the **show link state group detail** command:

```
Switch> show link state group detail
Link State Group: 1      Status: Enabled, Up
Upstream Interfaces   : Po1 (Up)
Downstream Interfaces : Gi0/3 (Up) Gi0/4 (Up)

Link State Group: 2      Status: Disabled, Down
Upstream Interfaces   :
Downstream Interfaces :

(Up):Interface up      (Dwn):Interface Down      (Dis):Interface disabled
```

Related Commands	Command	Description
	<a href="#">link state group</a>	Configures an interface as a member of a link-state group.
	<a href="#">link state track</a>	Enables a link-state group.
	<b>show running-config</b>	Displays the current operating configuration. For syntax information, select <b>Cisco IOS Configuration Fundamentals Command Reference for Release 12.2 &gt; Cisco IOS File Management Commands &gt; Configuration File Commands</b> .

# show mac access-group

Use the **show mac access-group** user EXEC command to display the MAC access control lists (ACLs) configured for an interface or a switch.

```
show mac access-group [interface interface-id] [ | {begin | exclude | include} expression]
```

Syntax Description	<b>interface interface-id</b>	(Optional) Display the MAC ACLs configured on a specific interface. Valid interfaces are physical ports and port channels; the port-channel range is 1 to 12 (available only in privileged EXEC mode).
	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.
	12.2(50)SE	The port-channel range was incorrect. The correct range is from 1 to 12.

Usage Guidelines	Expressions are case sensitive. For example, if you enter <b>  exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

Examples

This is an example of output from the **show mac-access group** user EXEC command. In this display, port 2 has the MAC access list *macl\_e1* applied; no MAC ACLs are applied to other interfaces.

```
Switch> show mac access-group
Interface GigabitEthernet0/1:
  Inbound access-list is not set
Interface GigabitEthernet0/2:
  Inbound access-list is macl_e1
Interface GigabitEthernet0/3:
  Inbound access-list is not set
Interface GigabitEthernet0/4:
  Inbound access-list is not set

<output truncated>
```

This is an example of output from the **show mac access-group interface gigabitethernet0/1** command:

```
Switch# show mac access-group interface gigabitethernet0/1
Interface GigabitEthernet0/1:
  Inbound access-list is macl_e1
```



**Related Commands**

Command	Description
<a href="#">mac access-group</a>	Applies a MAC access group to an interface.

# show mac address-table

Use the **show mac address-table** user EXEC command to display a specific MAC address table static and dynamic entry or the MAC address table static and dynamic entries on a specific interface or VLAN.

```
show mac address-table [ | {begin | exclude | include} expression]
```

Syntax Description	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

**Examples** This is an example of output from the **show mac address-table** command:

```
Switch> show mac address-table
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
A11     0000.0000.0001   STATIC  CPU
A11     0000.0000.0002   STATIC  CPU
A11     0000.0000.0003   STATIC  CPU
A11     0000.0000.0009   STATIC  CPU
A11     0000.0000.0012   STATIC  CPU
A11     0180.c200.000b   STATIC  CPU
A11     0180.c200.000c   STATIC  CPU
A11     0180.c200.000d   STATIC  CPU
A11     0180.c200.000e   STATIC  CPU
A11     0180.c200.000f   STATIC  CPU
A11     0180.c200.0010   STATIC  CPU
1       0030.9441.6327   DYNAMIC Gi0/4
Total Mac Addresses for this criterion: 12
```

Related Commands	Command	Description
	<b>clear mac address-table dynamic</b>	Deletes from the MAC address table a specific dynamic address, all dynamic addresses on a particular interface, or all dynamic addresses on a particular VLAN.
	<b>show mac address-table aging-time</b>	Displays the aging time in all VLANs or the specified VLAN.
	<b>show mac address-table count</b>	Displays the number of addresses present in all VLANs or the specified VLAN.
	<b>show mac address-table dynamic</b>	Displays dynamic MAC address table entries only.
	<b>show mac address-table interface</b>	Displays the MAC address table information for the specified interface.
	<b>show mac address-table notification</b>	Displays the MAC address notification settings for all interfaces or the specified interface.
	<b>show mac address-table static</b>	Displays static MAC address table entries only.
	<b>show mac address-table vlan</b>	Displays the MAC address table information for the specified VLAN.

# show mac address-table address

Use the **show mac address-table address** user EXEC command to display MAC address table information for the specified MAC address.

```
show mac address-table address mac-address [interface interface-id] [vlan vlan-id] [ | {begin |
exclude | include} expression]
```

Syntax Description	mac-address	Specify the 48-bit MAC address; the valid format is H.H.H.
	interface interface-id	(Optional) Display information for a specific interface. Valid interfaces include physical ports and port channels.
	vlan vlan-id	(Optional) Display entries for the specific VLAN only. The range is 1 to 4094.
	begin	(Optional) Display begins with the line that matches the <i>expression</i> .
	exclude	(Optional) Display excludes lines that match the <i>expression</i> .
	include	(Optional) Display includes lines that match the specified <i>expression</i> .
	expression	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** Expressions are case sensitive. For example, if you enter **| exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

**Examples** This is an example of output from the **show mac address-table address** command:

```
Switch# show mac address-table address 0002.4b28.c482
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
All     0002.4b28.c482   STATIC  CPU
Total Mac Addresses for this criterion: 1
```

Related Commands	Command	Description
	<a href="#">show mac address-table aging-time</a>	Displays the aging time in all VLANs or the specified VLAN.
	<a href="#">show mac address-table count</a>	Displays the number of addresses present in all VLANs or the specified VLAN.
	<a href="#">show mac address-table dynamic</a>	Displays dynamic MAC address table entries only.
	<a href="#">show mac address-table interface</a>	Displays the MAC address table information for the specified interface.
	<a href="#">show mac address-table notification</a>	Displays the MAC address notification settings for all interfaces or the specified interface.
	<a href="#">show mac address-table static</a>	Displays static MAC address table entries only.
	<a href="#">show mac address-table vlan</a>	Displays the MAC address table information for the specified VLAN.

# show mac address-table aging-time

Use the **show mac address-table aging-time** user EXEC command to display the aging time of a specific address table instance, all address table instances on a specified VLAN or, if a specific VLAN is not specified, on all VLANs.

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

Syntax Description	vlan vlan-id	(Optional) Display aging time information for a specific VLAN. The range is 1 to 4094.
	begin	(Optional) Display begins with the line that matches the <i>expression</i> .
	exclude	(Optional) Display excludes lines that match the <i>expression</i> .
	include	(Optional) Display includes lines that match the specified <i>expression</i> .
	expression	Expression in the output to use as a reference point.

Command Modes User EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines If no VLAN number is specified, the aging time for all VLANs appears. Expressions are case sensitive. For example, if you enter **| exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

Examples This is an example of output from the **show mac address-table aging-time** command:

```
Switch> show mac address-table aging-time
Vlan      Aging Time
----      -
1         300
```

This is an example of output from the **show mac address-table aging-time vlan 10** command:

```
Switch> show mac address-table aging-time vlan 10
Vlan      Aging Time
----      -
10        300
```

**Related Commands**

Command	Description
<a href="#">mac address-table aging-time</a>	Sets the length of time that a dynamic entry remains in the MAC address table after the entry is used or updated.
<a href="#">show mac address-table address</a>	Displays MAC address table information for the specified MAC address.
<a href="#">show mac address-table count</a>	Displays the number of addresses present in all VLANs or the specified VLAN.
<a href="#">show mac address-table dynamic</a>	Displays dynamic MAC address table entries only.
<a href="#">show mac address-table interface</a>	Displays the MAC address table information for the specified interface.
<a href="#">show mac address-table notification</a>	Displays the MAC address notification settings for all interfaces or the specified interface.
<a href="#">show mac address-table static</a>	Displays static MAC address table entries only.
<a href="#">show mac address-table vlan</a>	Displays the MAC address table information for the specified VLAN.

# show mac address-table count

Use the **show mac address-table count** user EXEC command to display the number of addresses present in all VLANs or the specified VLAN.

```
show mac address-table count [vlan vlan-id] [ | {begin | exclude | include} expression]
```

Syntax Description	vlan vlan-id	(Optional) Display the number of addresses for a specific VLAN. The range is 1 to 4094.
	begin	(Optional) Display begins with the line that matches the <i>expression</i> .
	exclude	(Optional) Display excludes lines that match the <i>expression</i> .
	include	(Optional) Display includes lines that match the specified <i>expression</i> .
	expression	Expression in the output to use as a reference point.

Command Modes	User EXEC
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Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

If no VLAN number is specified, the address count for all VLANs appears.

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

**Examples**

This is an example of output from the **show mac address-table count** command:

```
Switch# show mac address-table count
Mac Entries for Vlan   : 1
-----
Dynamic Address Count  : 2
Static Address Count   : 0
Total Mac Addresses    : 2
```



Related Commands	Command	Description
	<code>show mac address-table address</code>	Displays MAC address table information for the specified MAC address.
	<code>show mac address-table aging-time</code>	Displays the aging time in all VLANs or the specified VLAN.
	<code>show mac address-table dynamic</code>	Displays dynamic MAC address table entries only.
	<code>show mac address-table interface</code>	Displays the MAC address table information for the specified interface.
	<code>show mac address-table notification</code>	Displays the MAC address notification settings for all interfaces or the specified interface.
	<code>show mac address-table static</code>	Displays static MAC address table entries only.
	<code>show mac address-table vlan</code>	Displays the MAC address table information for the specified VLAN.

# show mac address-table dynamic

Use the **show mac address-table dynamic** user EXEC command to display only dynamic MAC address table entries.

```
show mac address-table dynamic [address mac-address] [interface interface-id] [vlan vlan-id]
[ | { begin | exclude | include } expression]
```

## Syntax Description

<b>address</b> <i>mac-address</i>	(Optional) Specify a 48-bit MAC address; the valid format is H.H.H (available in privileged EXEC mode only).
<b>interface</b> <i>interface-id</i>	(Optional) Specify an interface to match; valid <i>interfaces</i> include physical ports and port channels.
<b>vlan</b> <i>vlan-id</i>	(Optional) Display entries for a specific VLAN; the range is 1 to 4094.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

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

## Examples

This is an example of output from the **show mac address-table dynamic** command:

```
Switch> show mac address-table dynamic
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0030.b635.7862   DYNAMIC Gi0/2
1       00b0.6496.2741   DYNAMIC Gi0/2
Total Mac Addresses for this criterion: 2
```

**Related Commands**

Command	Description
<b>clear mac address-table dynamic</b>	Deletes from the MAC address table a specific dynamic address, all dynamic addresses on a particular interface, or all dynamic addresses on a particular VLAN.
<b>show mac address-table address</b>	Displays MAC address table information for the specified MAC address.
<b>show mac address-table aging-time</b>	Displays the aging time in all VLANs or the specified VLAN.
<b>show mac address-table count</b>	Displays the number of addresses present in all VLANs or the specified VLAN.
<b>show mac address-table interface</b>	Displays the MAC address table information for the specified interface.
<b>show mac address-table static</b>	Displays static MAC address table entries only.
<b>show mac address-table vlan</b>	Displays the MAC address table information for the specified VLAN.

# show mac address-table interface

Use the **show mac address-table interface** user command to display the MAC address table information for the specified interface in the specified VLAN.

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

## Syntax Description

<i>interface-id</i>	Specify an interface type; valid interfaces include physical ports and port channels.
<b>vlan</b> <i>vlan-id</i>	(Optional) Display entries for a specific VLAN; the range is 1 to 4094.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

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

## Examples

This is an example of output from the **show mac address-table interface** command:

```
Switch> show mac address-table interface gigabitethernet0/2
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0030.b635.7862   DYNAMIC Gi0/2
1       00b0.6496.2741   DYNAMIC Gi0/2
Total Mac Addresses for this criterion: 2
```

Related Commands	Command	Description
	<b>show mac address-table address</b>	Displays MAC address table information for the specified MAC address.
	<b>show mac address-table aging-time</b>	Displays the aging time in all VLANs or the specified VLAN.
	<b>show mac address-table count</b>	Displays the number of addresses present in all VLANs or the specified VLAN.
	<b>show mac address-table dynamic</b>	Displays dynamic MAC address table entries only.
	<b>show mac address-table notification</b>	Displays the MAC address notification settings for all interfaces or the specified interface.
	<b>show mac address-table static</b>	Displays static MAC address table entries only.
	<b>show mac address-table vlan</b>	Displays the MAC address table information for the specified VLAN.

# show mac address-table learning

Use the **show mac address-table learning** user EXEC command to display the status of MAC address learning for all VLANs or the specified VLAN.

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

## Syntax Description

<b>vlan</b> <i>vlan-id</i>	(Optional) Display information for a specific VLAN. The range is 1 to 4094.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(46)SE	This command was introduced.

## Usage Guidelines

Use the **show mac address-table learning** command without any keywords to display configured VLANs and whether MAC address learning is enabled or disabled on them. The default is that MAC address learning is enabled on all VLANs. Use the command with a specific VLAN ID to display the learning status on an individual VLAN.

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

## Examples

This is an example of output from the **show mac address-table learning** user EXEC command showing that MAC address learning is disabled on VLAN 200:

```
Switch> show mac address-table learning
VLAN      Learning Status
----      -
1          yes
100        yes
200        no
```

## Related Commands

Command	Description
<a href="#">mac address-table learning vlan</a>	Enables or disables MAC address learning on a VLAN.

# show mac address-table move update

Use the **show mac address-table move update** user EXEC command to display the MAC address-table move update information on the switch.

**show mac address-table move update** [ | {**begin** | **exclude** | **include**} *expression*]

<b>Syntax Description</b>	<b>begin</b>	(Optional) Display begins with the line that matches the expression.
	<b>exclude</b>	(Optional) Display excludes lines that match the expression.
	<b>include</b>	(Optional) Display includes lines that match the specified expression.
	<i>expression</i>	Expression in the output to use as a reference point.

<b>Command Modes</b>	User EXEC
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

<b>Usage Guidelines</b>	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain output do not appear, but the lines that contain <i>Output</i> appear.
-------------------------	---

<b>Examples</b>	This is an example of output from the <b>show mac address-table move update</b> command:
-----------------	--

```
Switch> show mac address-table move update
Switch-ID : 010b.4630.1780
Dst mac-address : 0180.c200.0010
Vlans/Macs supported : 1023/8320
Default/Current settings: Rcv Off/On, Xmt Off/On
Max packets per min : Rcv 40, Xmt 60
Rcv packet count : 10
Rcv conforming packet count : 5
Rcv invalid packet count : 0
Rcv packet count this min : 0
Rcv threshold exceed count : 0
Rcv last sequence# this min : 0
Rcv last interface : Po2
Rcv last src-mac-address : 0003.fd6a.8701
Rcv last switch-ID : 0303.fd63.7600
Xmt packet count : 0
Xmt packet count this min : 0
Xmt threshold exceed count : 0
Xmt pak buf unavail cnt : 0
Xmt last interface : None
switch#
```

■ show mac address-table move update

Related Commands	Command	Description
	<a href="#">clear mac address-table move update</a>	Clears the MAC address-table move update counters.
	<a href="#">mac address-table move update {receive   transmit}</a>	Configures MAC address-table move update on the switch.



# show mac address-table notification

Use the **show mac address-table notification** user EXEC command to display the MAC address notification settings for all interfaces or the specified interface.

**show mac address-table notification** [**interface** *interface-id*] [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description		
<b>interface</b>	(Optional) Display information for all interfaces. Valid interfaces include physical ports and port channels.	
<i>interface-id</i>	(Optional) Display information for the specified interface. Valid interfaces include physical ports and port channels.	
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .	
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .	
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .	
<i>expression</i>	Expression in the output to use as a reference point.	

Command Modes	User EXEC
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Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	<p>Use the <b>show mac address-table notification</b> command without any keywords to display whether the feature is enabled or disabled, the MAC notification interval, the maximum number of entries allowed in the history table, and the history table contents.</p> <p>Use the <b>interface</b> keyword to display the flags for all interfaces. If the <i>interface-id</i> is included, only the flags for that interface appear.</p> <p>Expressions are case sensitive. For example, if you enter <b>  exclude output</b>, the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.</p>
------------------	--

Examples	This is an example of output from the <b>show mac address-table notification</b> command:
----------	---

```
Switch> show mac address-table notification
MAC Notification Feature is Enabled on the switch
Interval between Notification Traps : 60 secs
Number of MAC Addresses Added : 4
Number of MAC Addresses Removed : 4
Number of Notifications sent to NMS : 3
Maximum Number of entries configured in History Table : 100
Current History Table Length : 3
MAC Notification Traps are Enabled
History Table contents
-----
History Index 0, Entry Timestamp 1032254, Despatch Timestamp 1032254
MAC Changed Message :
```

## show mac address-table notification

```
Operation: Added   Vlan: 2      MAC Addr: 0000.0000.0001 Module: 0   Port: 1
```

```
History Index 1, Entry Timestamp 1038254, Despatch Timestamp 1038254
```

```
MAC Changed Message :
```

```
Operation: Added   Vlan: 2      MAC Addr: 0000.0000.0000 Module: 0   Port: 1
```

```
Operation: Added   Vlan: 2      MAC Addr: 0000.0000.0002 Module: 0   Port: 1
```

```
Operation: Added   Vlan: 2      MAC Addr: 0000.0000.0003 Module: 0   Port: 1
```

```
History Index 2, Entry Timestamp 1074254, Despatch Timestamp 1074254
```

```
MAC Changed Message :
```

```
Operation: Deleted Vlan: 2      MAC Addr: 0000.0000.0000 Module: 0   Port: 1
```

```
Operation: Deleted Vlan: 2      MAC Addr: 0000.0000.0001 Module: 0   Port: 1
```

```
Operation: Deleted Vlan: 2      MAC Addr: 0000.0000.0002 Module: 0   Port: 1
```

```
Operation: Deleted Vlan: 2      MAC Addr: 0000.0000.0003 Module: 0   Port: 1
```

### Related Commands

Command	Description
<b>clear mac address-table notification</b>	Clears the MAC address notification global counters.
<b>show mac address-table address</b>	Displays MAC address table information for the specified MAC address.
<b>show mac address-table aging-time</b>	Displays the aging time in all VLANs or the specified VLAN.
<b>show mac address-table count</b>	Displays the number of addresses present in all VLANs or the specified VLAN.
<b>show mac address-table dynamic</b>	Displays dynamic MAC address table entries only.
<b>show mac address-table interface</b>	Displays the MAC address table information for the specified interface.
<b>show mac address-table static</b>	Displays static MAC address table entries only.
<b>show mac address-table vlan</b>	Displays the MAC address table information for the specified VLAN.

# show mac address-table static

Use the **show mac address-table static** user EXEC command to display only static MAC address table entries.

```
show mac address-table static [address mac-address] [interface interface-id] [vlan vlan-id]
[ | {begin | exclude | include} expression]
```

Syntax Description	
<b>address</b> <i>mac-address</i>	(Optional) Specify a 48-bit MAC address; the valid format is H.H.H (available in privileged EXEC mode only).
<b>interface</b> <i>interface-id</i>	(Optional) Specify an interface to match; valid <i>interfaces</i> include physical ports and port channels.
<b>vlan</b> <i>vlan-id</i>	(Optional) Display addresses for a specific VLAN. The range is 1 to 4094.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

Examples	This is an example of output from the <b>show mac address-table static</b> command:
----------	---

```
Switch> show mac address-table static

      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
All     0100.0ccc.cccc   STATIC  CPU
All     0180.c200.0000   STATIC  CPU
All     0100.0ccc.cccd   STATIC  CPU
All     0180.c200.0001   STATIC  CPU
All     0180.c200.0004   STATIC  CPU
All     0180.c200.0005   STATIC  CPU
4       0001.0002.0004   STATIC  Drop
6       0001.0002.0007   STATIC  Drop
Total Mac Addresses for this criterion: 8
```

Related Commands	Command	Description
	<a href="#">mac address-table static</a>	Adds static addresses to the MAC address table.
	<a href="#">mac address-table static drop</a>	Enables unicast MAC address filtering and configures the switch to drop traffic with a specific source or destination MAC address.
	<a href="#">show mac address-table address</a>	Displays MAC address table information for the specified MAC address.
	<a href="#">show mac address-table aging-time</a>	Displays the aging time in all VLANs or the specified VLAN.
	<a href="#">show mac address-table count</a>	Displays the number of addresses present in all VLANs or the specified VLAN.
	<a href="#">show mac address-table dynamic</a>	Displays dynamic MAC address table entries only.
	<a href="#">show mac address-table interface</a>	Displays the MAC address table information for the specified interface.
	<a href="#">show mac address-table notification</a>	Displays the MAC address notification settings for all interfaces or the specified interface.
	<a href="#">show mac address-table vlan</a>	Displays the MAC address table information for the specified VLAN.

# show mac address-table vlan

Use the **show mac address-table vlan** user EXEC command to display the MAC address table information for the specified VLAN.

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

## Syntax Description

<i>vlan-id</i>	(Optional) Display addresses for a specific VLAN. The range is 1 to 4094.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

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

## Examples

This is an example of output from the **show mac address-table vlan 1** command:

```
Switch> show mac address-table vlan 1
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0100.0ccc.cccc   STATIC  CPU
1       0180.c200.0000   STATIC  CPU
1       0100.0ccc.cccd   STATIC  CPU
1       0180.c200.0001   STATIC  CPU
1       0180.c200.0002   STATIC  CPU
1       0180.c200.0003   STATIC  CPU
1       0180.c200.0005   STATIC  CPU
1       0180.c200.0006   STATIC  CPU
1       0180.c200.0007   STATIC  CPU
Total Mac Addresses for this criterion: 9
```

Related Commands	Command	Description
	<a href="#">show mac address-table address</a>	Displays MAC address table information for the specified MAC address.
	<a href="#">show mac address-table aging-time</a>	Displays the aging time in all VLANs or the specified VLAN.
	<a href="#">show mac address-table count</a>	Displays the number of addresses present in all VLANs or the specified VLAN.
	<a href="#">show mac address-table dynamic</a>	Displays dynamic MAC address table entries only.
	<a href="#">show mac address-table interface</a>	Displays the MAC address table information for the specified interface.
	<a href="#">show mac address-table notification</a>	Displays the MAC address notification settings for all interfaces or the specified interface.
	<a href="#">show mac address-table static</a>	Displays static MAC address table entries only.

# show mls qos

Use the **show mls qos** user EXEC command to display global quality of service (QoS) configuration information.

```
show mls qos [ | {begin | exclude | include} expression]
```

Syntax Description	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

Examples	This is an example of output from the <b>show mls qos</b> command:
----------	--

```
Switch> show mls qos
QoS is enabled
```

This is an example of output from the **show mls qos** command when QoS is enabled and Differentiated Services Code Point (DSCP) transparency is disabled:

```
Switch> show mls qos
QoS is enabled
QoS ip packet dscp rewrite is disabled
```

This is an example of output from the **show mls qos** command when QoS is enabled and DSCP transparency is enabled:

```
Switch> show mls qos
QoS is enabled
QoS ip packet dscp rewrite is enabled
```

Related Commands	Command	Description
	<a href="#">mls qos</a>	Enables QoS for the entire switch.

# show mls qos aggregate-policer

Use the **show mls qos aggregate-policer** user EXEC command to display the quality of service (QoS) aggregate policer configuration. A policer defines a maximum permissible rate of transmission, a maximum burst size for transmissions, and an action to take if either maximum is exceeded.

```
show mls qos aggregate-policer [aggregate-policer-name] [ | { begin | exclude | include }
expression]
```

Syntax Description	<i>aggregate-policer-name</i>	(Optional) Display the policer configuration for the specified name.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes User EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines Expressions are case sensitive. For example, if you enter | **exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

Examples This is an example of output from the **show mls qos aggregate-policer** command:

```
Switch> show mls qos aggregate-policer policer1
aggregate-policer policer1 1000000 2000000 exceed-action drop
Not used by any policy map
```

Related Commands	Command	Description
	<a href="#">mls qos aggregate-policer</a>	Defines policer parameters that can be shared by multiple classes within a policy map.



# show mls qos input-queue

Use the **show mls qos input-queue** user EXEC command to display quality of service (QoS) settings for the ingress queues.

**show mls qos input-queue** [ **|** { **begin** | **exclude** | **include** } *expression* ]

<b>Syntax Description</b>	<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

<b>Command Modes</b>	User EXEC
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

<b>Usage Guidelines</b>	Expressions are case sensitive. For example, if you enter <b>  exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
-------------------------	--

**Examples** This is an example of output from the **show mls qos input-queue** command:

```
Switch> show mls qos input-queue
Queue      :      1      2
-----
buffers    :      90     10
bandwidth  :       4      4
priority   :       0     10
threshold1 :     100    100
threshold2 :     100    100
```

■ show mls qos input-queue

Related Commands	Command	Description
	<a href="#">mls qos srr-queue input bandwidth</a>	Assigns shaped round robin (SRR) weights to an ingress queue.
	<a href="#">mls qos srr-queue input buffers</a>	Allocates the buffers between the ingress queues.
	<a href="#">mls qos srr-queue input cos-map</a>	Maps assigned class of service (CoS) values to an ingress queue and assigns CoS values to a queue and to a threshold ID.
	<a href="#">mls qos srr-queue input dscp-map</a>	Maps assigned Differentiated Services Code Point (DSCP) values to an ingress queue and assigns DSCP values to a queue and to a threshold ID.
	<a href="#">mls qos srr-queue input priority-queue</a>	Configures the ingress priority queue and guarantees bandwidth.
	<a href="#">mls qos srr-queue input threshold</a>	Assigns weighted tail-drop (WTD) threshold percentages to an ingress queue.

# show mls qos interface

Use the **show mls qos interface** user EXEC command to display quality of service (QoS) information at the port level.

**show mls qos interface** [*interface-id*] [**buffers** | **queueing** | **statistics**]  
[ | {**begin** | **exclude** | **include**} *expression*]

Syntax Description	
<i>interface-id</i>	(Optional) Display QoS information for the specified port. Valid interfaces include physical ports.
<b>buffers</b>	(Optional) Display the buffer allocation among the queues.
<b>queueing</b>	(Optional) Display the queueing strategy (shared or shaped) and the weights corresponding to the queues.
<b>statistics</b>	(Optional) Display statistics for sent and received Differentiated Services Code Points (DSCPs) and class of service (CoS) values, the number of packets enqueued or dropped per egress queue, and the number of in-profile and out-of-profile packets for each policer.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.



## Note

Though visible in the command-line help string, the **policers** keyword is not supported.

Command Modes	User EXEC
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Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

Examples	This is an example of output from the <b>show mls qos interface</b> <i>interface-id</i> command when VLAN-based QoS is enabled:
----------	---

```
Switch> show mls qos interface gigabitethernet0/1
GigabitEthernet0/1
trust state:not trusted
trust mode:not trusted
trust enabled flag:ena
COS override:dis
default COS:0
```

```
DSCP Mutation Map:Default DSCP Mutation Map
Trust device:none
qos mode:vlan-based
```

This is an example of output from the **show mls qos interface *interface-id*** command when VLAN-based QoS is disabled:

```
Switch> show mls qos interface gigabitethernet0/2
GigabitEthernet0/2
trust state:not trusted
trust mode:not trusted
trust enabled flag:ena
COS override:dis
default COS:0
DSCP Mutation Map:Default DSCP Mutation Map
Trust device:none
qos mode:port-based
```

This is an example of output from the **show mls qos interface *interface-id* buffers** command:

```
Switch> show mls qos interface gigabitethernet0/2 buffers
GigabitEthernet0/2
The port is mapped to qset : 1
The allocations between the queues are : 25 25 25 25
```

This is an example of output from the **show mls qos interface *interface-id* queueing** command. The egress expedite queue overrides the configured shaped round robin (SRR) weights.

```
Switch> show mls qos interface gigabitethernet0/2 queueing
GigabitEthernet0/2
Egress Priority Queue :enabled
Shaped queue weights (absolute) : 25 0 0 0
Shared queue weights : 25 25 25 25
The port bandwidth limit : 100 (Operational Bandwidth:100.0)
The port is mapped to qset : 1
```

This is an example of output from the **show mls qos interface *interface-id* statistics** command. [Table 2-30](#) describes the fields in this display.

```
Switch> show mls qos interface gigabitethernet0/2 statistics
GigabitEthernet0/2

dscp: incoming
-----
 0 - 4 :      4213      0      0      0      0
 5 - 9 :         0      0      0      0      0
10 - 14 :         0      0      0      0      0
15 - 19 :         0      0      0      0      0
20 - 24 :         0      0      0      0      0
25 - 29 :         0      0      0      0      0
30 - 34 :         0      0      0      0      0
35 - 39 :         0      0      0      0      0
40 - 44 :         0      0      0      0      0
45 - 49 :         0      0      0      6      0
50 - 54 :         0      0      0      0      0
55 - 59 :         0      0      0      0      0
60 - 64 :         0      0      0      0      0
dscp: outgoing
-----
 0 - 4 :     363949      0      0      0      0
 5 - 9 :         0      0      0      0      0
10 - 14 :         0      0      0      0      0
```

```

15 - 19 :      0      0      0      0      0
20 - 24 :      0      0      0      0      0
25 - 29 :      0      0      0      0      0
30 - 34 :      0      0      0      0      0
35 - 39 :      0      0      0      0      0
40 - 44 :      0      0      0      0      0
45 - 49 :      0      0      0      0      0
50 - 54 :      0      0      0      0      0
55 - 59 :      0      0      0      0      0
60 - 64 :      0      0      0      0      0
cos: incoming
-----
0 - 4 :    132067      0      0      0      0
5 - 9 :      0      0      0
cos: outgoing
-----
0 - 4 :    739155      0      0      0      0
5 - 9 :      90      0      0
Policer: Inprofile:      0 OutofProfile:      0

```

**Table 2-30** *show mls qos interface statistics Field Descriptions*

Field		Description
DSCP	incoming	Number of packets received for each DSCP value.
	outgoing	Number of packets sent for each DSCP value.
CoS	incoming	Number of packets received for each CoS value.
	outgoing	Number of packets sent for each CoS value.
Policer	Inprofile	Number of in profile packets for each policer.
	Outofprofile	Number of out-of-profile packets for each policer.

Related Commands	Command	Description
	<a href="#">mls qos queue-set output buffers</a>	Allocates buffers to a queue-set.
	<a href="#">mls qos queue-set output threshold</a>	Configures the weighted tail-drop (WTD) thresholds, guarantees the availability of buffers, and configures the maximum memory allocation to a queue-set.
	<a href="#">mls qos srr-queue input bandwidth</a>	Assigns SRR weights to an ingress queue.
	<a href="#">mls qos srr-queue input buffers</a>	Allocates the buffers between the ingress queues.
	<a href="#">mls qos srr-queue input cos-map</a>	Maps CoS values to an ingress queue or maps CoS values to a queue and to a threshold ID.
	<a href="#">mls qos srr-queue input dscp-map</a>	Maps DSCP values to an ingress queue or maps DSCP values to a queue and to a threshold ID.
	<a href="#">mls qos srr-queue input priority-queue</a>	Configures the ingress priority queue and guarantees bandwidth.
	<a href="#">mls qos srr-queue input threshold</a>	Assigns WTD threshold percentages to an ingress queue.
	<a href="#">mls qos srr-queue output cos-map</a>	Maps CoS values to an egress queue or maps CoS values to a queue and to a threshold ID.

Command	Description
<b>mls qos srr-queue output dscp-map</b>	Maps DSCP values to an egress queue or maps DSCP values to a queue and to a threshold ID.
<b>policy-map</b>	Creates or modifies a policy map.
<b>priority-queue</b>	Enables the egress expedite queue on a port.
<b>queue-set</b>	Maps a port to a queue-set.
<b>srr-queue bandwidth limit</b>	Limits the maximum output on a port.
<b>srr-queue bandwidth shape</b>	Assigns the shaped weights and enables bandwidth shaping on the four egress queues mapped to a port.
<b>srr-queue bandwidth share</b>	Assigns the shared weights and enables bandwidth sharing on the four egress queues mapped to a port.

# show mls qos maps

Use the **show mls qos maps** user EXEC command to display quality of service (QoS) mapping information. During classification, QoS uses the mapping tables to represent the priority of the traffic and to derive a corresponding class of service (CoS) or Differentiated Services Code Point (DSCP) value from the received CoS, DSCP, or IP precedence value.

```
show mls qos maps [cos-dscp | cos-input-q | cos-output-q | dscp-cos | dscp-input-q |
dscp-mutation dscp-mutation-name | dscp-output-q | ip-prec-dscp | policed-dscp] [ | {begin
| exclude | include} expression]
```

Syntax Description		
<b>cos-dscp</b>	(Optional)	Display class of service (CoS)-to-DSCP map.
<b>cos-input-q</b>	(Optional)	Display the CoS input queue threshold map.
<b>cos-output-q</b>	(Optional)	Display the CoS output queue threshold map.
<b>dscp-cos</b>	(Optional)	Display DSCP-to-CoS map.
<b>dscp-input-q</b>	(Optional)	Display the DSCP input queue threshold map.
<b>dscp-mutation</b> <i>dscp-mutation-name</i>	(Optional)	Display the specified DSCP-to-DSCP-mutation map.
<b>dscp-output-q</b>	(Optional)	Display the DSCP output queue threshold map.
<b>ip-prec-dscp</b>	(Optional)	Display the IP-precedence-to-DSCP map.
<b>policed-dscp</b>	(Optional)	Display the policed-DSCP map.
<b>  begin</b>	(Optional)	Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional)	Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional)	Display includes lines that match the specified <i>expression</i> .
<i>expression</i>		Expression in the output to use as a reference point.

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

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** Expressions are case sensitive. For example, if you enter **| exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

The policed-DSCP, DSCP-to-CoS, and the DSCP-to-DSCP-mutation maps appear as a matrix. The d1 column specifies the most-significant digit in the DSCP. The d2 row specifies the least-significant digit in the DSCP. The intersection of the d1 and d2 values provides the policed-DSCP, the CoS, or the mutated-DSCP value. For example, in the DSCP-to-CoS map, a DSCP value of 43 corresponds to a CoS value of 5.

The DSCP input queue threshold and the DSCP output queue threshold maps appear as a matrix. The d1 column specifies the most-significant digit of the DSCP number. The d2 row specifies the least-significant digit in the DSCP number. The intersection of the d1 and the d2 values provides the queue ID and threshold ID. For example, in the DSCP input queue threshold map, a DSCP value of 43 corresponds to queue 2 and threshold 1 (02-01).

The CoS input queue threshold and the CoS output queue threshold maps show the CoS value in the top row and the corresponding queue ID and threshold ID in the second row. For example, in the CoS input queue threshold map, a CoS value of 5 corresponds to queue 2 and threshold 1 (2-1).

## Examples

This is an example of output from the **show mls qos maps** command:

Switch> **show mls qos maps**

Policed-dscp map:

```

d1 : d2 0  1  2  3  4  5  6  7  8  9
-----
0 :   00 01 02 03 04 05 06 07 08 09
1 :   10 11 12 13 14 15 16 17 18 19
2 :   20 21 22 23 24 25 26 27 28 29
3 :   30 31 32 33 34 35 36 37 38 39
4 :   40 41 42 43 44 45 46 47 48 49
5 :   50 51 52 53 54 55 56 57 58 59
6 :   60 61 62 63

```

Dscp-cos map:

```

d1 : d2 0  1  2  3  4  5  6  7  8  9
-----
0 :   00 00 00 00 00 00 00 00 01 01
1 :   01 01 01 01 01 01 02 02 02 02
2 :   02 02 02 02 03 03 03 03 03 03
3 :   03 03 04 04 04 04 04 04 04 04
4 :   05 05 05 05 05 05 05 05 06 06
5 :   06 06 06 06 06 06 07 07 07 07
6 :   07 07 07 07

```

Cos-dscp map:

```

cos:  0  1  2  3  4  5  6  7
-----
dscp:  0  8 16 24 32 40 48 56

```

IpPrecedence-dscp map:

```

ipprec:  0  1  2  3  4  5  6  7
-----
dscp:    0  8 16 24 32 40 48 56

```

Dscp-outputq-threshold map:

```

d1 :d2  0      1      2      3      4      5      6      7      8      9
-----
0 :   02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01
1 :   02-01 02-01 02-01 02-01 02-01 02-01 03-01 03-01 03-01 03-01
2 :   03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01
3 :   03-01 03-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01
4 :   01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 04-01 04-01
5 :   04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01
6 :   04-01 04-01 04-01 04-01

```

Dscp-inputq-threshold map:

```

d1 :d2  0      1      2      3      4      5      6      7      8      9
-----
0 :   01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
1 :   01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01

```



```

2 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
3 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
4 :    02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 01-01 01-01
5 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
6 :    01-01 01-01 01-01 01-01

```

Cos-outputq-threshold map:

```

cos:  0   1   2   3   4   5   6   7
-----
queue-threshold: 2-1 2-1 3-1 3-1 4-1 1-1 4-1 4-1

```

Cos-inputq-threshold map:

```

cos:  0   1   2   3   4   5   6   7
-----
queue-threshold: 1-1 1-1 1-1 1-1 1-1 2-1 1-1 1-1

```

Dscp-dscp mutation map:

Default DSCP Mutation Map:

```

d1 :  d2 0   1   2   3   4   5   6   7   8   9
-----
0 :    00 01 02 03 04 05 06 07 08 09
1 :    10 11 12 13 14 15 16 17 18 19
2 :    20 21 22 23 24 25 26 27 28 29
3 :    30 31 32 33 34 35 36 37 38 39
4 :    40 41 42 43 44 45 46 47 48 49
5 :    50 51 52 53 54 55 56 57 58 59
6 :    60 61 62 63

```

## Related Commands

Command	Description
<b>mls qos map</b>	Defines the CoS-to-DSCP map, DSCP-to-CoS map, DSCP-to-DSCP-mutation map, IP-precedence-to-DSCP map, and the policed-DSCP map.
<b>mls qos srr-queue input cos-map</b>	Maps CoS values to an ingress queue or maps CoS values to a queue and to a threshold ID.
<b>mls qos srr-queue input dscp-map</b>	Maps DSCP values to an ingress queue or maps DSCP values to a queue and to a threshold ID.
<b>mls qos srr-queue output cos-map</b>	Maps CoS values to an egress queue or maps CoS values to a queue and to a threshold ID.
<b>mls qos srr-queue output dscp-map</b>	Maps DSCP values to an egress queue or maps DSCP values to a queue and to a threshold ID.

# show mls qos queue-set

Use the **show mls qos queue-set** user EXEC command to display quality of service (QoS) settings for the egress queues.

```
show mls qos queue-set [qset-id] [ | {begin | exclude | include} expression]
```

Syntax Description	<i>qset-id</i>	(Optional) ID of the queue-set. Each port belongs to a queue-set, which defines all the characteristics of the four egress queues per port. The range is 1 to 2.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

**Examples** This is an example of output from the **show mls qos queue-set** command:

```
Switch> show mls qos queue-set
Queueset: 1
Queue   :      1      2      3      4
-----
buffers  :      25      25      25      25
threshold1:    100     200     100     100
threshold2:    100     200     100     100
reserved  :      50      50      50      50
maximum  :     400     400     400     400
Queueset: 2
Queue   :      1      2      3      4
-----
buffers  :      25      25      25      25
threshold1:    100     200     100     100
threshold2:    100     200     100     100
reserved  :      50      50      50      50
maximum  :     400     400     400     400
```

**Related Commands**

Command	Description
<a href="#">mls qos queue-set output buffers</a>	Allocates buffers to the queue-set.
<a href="#">mls qos queue-set output threshold</a>	Configures the weighted tail-drop (WTD) thresholds, guarantees the availability of buffers, and configures the maximum memory allocation of the queue-set.

# show mls qos vlan

Use the **show mls qos vlan** user EXEC command to display the policy maps attached to a switch virtual interface (SVI).

**show mls qos vlan** *vlan-id* [ | { **begin** | **exclude** | **include** } *expression* ]

Syntax Description	<i>vlan-id</i>	Specify the VLAN ID of the SVI to display the policy maps. The range is 1 to 4094.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

The output from the **show mls qos vlan** command is meaningful only when VLAN-based quality of service (QoS) is enabled and when hierarchical policy maps are configured.

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

**Examples**

This is an example of output from the **show mls qos vlan** command:

```
Switch> show mls qos vlan 10
Vlan10
Attached policy-map for Ingress:pm-test-pm-2
```

Related Commands	<b>Command</b>	<b>Description</b>
	<a href="#">policy-map</a>	Creates or modifies a policy map that can be attached to multiple ports and enters policy-map configuration mode.

# show monitor

Use the **show monitor** user EXEC command to display information about all Switched Port Analyzer (SPAN) and Remote SPAN (RSPAN) sessions on the switch. Use the command with keywords to show a specific session, all sessions, all local sessions, or all remote sessions.

**show monitor** [**session** { *session\_number* | **all** | **local** | **range list** | **remote** } [**detail**]] [ | { **begin** | **exclude** | **include** } *expression*]

Syntax Description	
<b>session</b>	(Optional) Display information about specified SPAN sessions.
<b>session_number</b>	Specify the number of the SPAN or RSPAN session. The range is 1 to 66.
<b>all</b>	Display all SPAN sessions.
<b>local</b>	Display only local SPAN sessions.
<b>range list</b>	Display a range of SPAN sessions, where <i>list</i> is the range of valid sessions, either a single session or a range of sessions described by two numbers, the lower one first, separated by a hyphen. Do not enter any spaces between comma-separated parameters or in hyphen-specified ranges.  <b>Note</b> This keyword is available only in privileged EXEC mode.
<b>remote</b>	Display only remote SPAN sessions.
<b>detail</b>	(Optional) Display detailed information about the specified sessions.
<b>begin</b>	Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	Display excludes lines that match the <i>expression</i> .
<b>include</b>	Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

**Command Modes** User EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** Expressions are case sensitive. For example, if you enter | **exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

The output is the same for the **show monitor** command and the **show monitor session all** command.

**Examples** This is an example of output for the **show monitor** user EXEC command:

```
Switch# show monitor
Session 1
-----
Type : Local Session
Source Ports :
RX Only : Fa0/1
RX Only : Gi0/11
```

```
Both : Fa0/2-3,Fa0/5-6
Both : Gi0/12-13,Gi0/5-614-15
Destination Ports : Fa0/20
Destination Ports : Gi0/10
Encapsulation : Replicate
Ingress : Disabled
```

```
Session 2
```

```
-----
```

```
Type : Remote Source Session
Source VLANs :
TX Only : 10
Both : 1-9
Dest RSPAN VLAN : 105
```

This is an example of output for the **show monitor** user EXEC command for local SPAN source session 1:

```
Switch# show monitor session 1
Session 1
```

```
-----
```

```
Type : Local Session
Source Ports :
RX Only : Fa0/1
RX Only : Gi0/11
Both : Fa0/2-3,Fa0/5-6
Both : Gi0/12-13,Gi0/5-614-15
Destination Ports : Fa0/20
Destination Ports : Gi0/10
Encapsulation : Replicate
Ingress : Disabled
```

This is an example of output for the **show monitor session all** user EXEC command when ingress traffic forwarding is enabled:

```
Switch# show monitor session all
```

```
Session 1
```

```
-----
```

```
Type : Local Session
Source Ports :
Both : Fa0/2
Both : Gi0/11
Destination Ports : Fa0/3
Destination Ports : Gi0/15
Encapsulation : Native
Ingress : Enabled, default VLAN = 5
Ingress encap : DOT1Q
```

```
Session 2
```

```
-----
```

```
Type : Local Session
Source Ports :
Both : Fa0/8
Both : Gi0/8
Destination Ports : Fa0/1
Destination Ports : Gi0/12
Encapsulation : Replicate
Ingress : Enabled, default VLAN = 4
Ingress encap : Untagged
```

**Related Commands**

Command	Description
<a href="#">monitor session</a>	Starts or modifies a SPAN or RSPAN session.

# show mvr

Use the **show mvr** privileged EXEC command without keywords to display the current Multicast VLAN Registration (MVR) global parameter values, including whether or not MVR is enabled, the MVR multicast VLAN, the maximum query response time, the number of multicast groups, and the MVR mode (dynamic or compatible).

```
show mvr [ | {begin | exclude | include} expression]
```

Syntax Description	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	Privileged EXEC
---------------	-----------------

Command History	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

**Examples** This is an example of output from the **show mvr** command:

```
Switch# show mvr
MVR Running: TRUE
MVR multicast VLAN: 1
MVR Max Multicast Groups: 256
MVR Current multicast groups: 0
MVR Global query response time: 5 (tenths of sec)
MVR Mode: compatible
```

In the preceding display, the maximum number of multicast groups is fixed at 256. The MVR mode is either compatible (for interoperability with Catalyst 2900 XL and Catalyst 3500 XL switches) or dynamic (where operation is consistent with IGMP snooping operation and dynamic MVR membership on source ports is supported).



Related Commands	Command	Description
	<a href="#">mvr (global configuration)</a>	Enables and configures multicast VLAN registration on the switch.
	<a href="#">mvr (interface configuration)</a>	Configures MVR ports.
	<a href="#">show mvr interface</a>	Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the <b>interface</b> and <b>members</b> keywords are appended to the command.
	<a href="#">show mvr members</a>	Displays all ports that are members of an MVR multicast group or, if there are no members, means the group is inactive.

# show mvr interface

Use the **show mvr interface** privileged EXEC command without keywords to display the Multicast VLAN Registration (MVR) receiver and source ports. Use the command with keywords to display MVR parameters for a specific receiver port.

```
show mvr interface [interface-id [members [vlan vlan-id]]] [ | {begin | exclude | include}
expression]
```

Syntax Description	interface-id	(Optional) Display MVR type, status, and Immediate Leave setting for the interface.  Valid interfaces include physical ports (including type, module, and port number).
	members	(Optional) Display all MVR groups to which the specified interface belongs.
	vlan vlan-id	(Optional) Display all MVR group members on this VLAN. The range is 1 to 4094.
	begin	(Optional) Display begins with the line that matches the <i>expression</i> .
	exclude	(Optional) Display excludes lines that match the <i>expression</i> .
	include	(Optional) Display includes lines that match the specified <i>expression</i> .
	expression	Expression in the output to use as a reference point.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

If the entered port identification is a non-MVR port or a source port, the command returns an error message. For receiver ports, it displays the port type, per port status, and Immediate-Leave setting.

If you enter the **members** keyword, all MVR group members on the interface appear. If you enter a VLAN ID, all MVR group members in the VLAN appear.

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

**Examples** This is an example of output from the **show mvr interface** command:

```
Switch# show mvr interface
Port      Type      Status      Immediate Leave
----      -
Gi0/1     SOURCE    ACTIVE/UP    DISABLED
Gi0/2     RECEIVER  ACTIVE/DOWN  DISABLED
```

In the preceding display, Status is defined as follows:

- Active means the port is part of a VLAN.
- Up/Down means that the port is forwarding/nonforwarding.
- Inactive means that the port is not yet part of any VLAN.

This is an example of output from the **show mvr interface** command for a specified port:

```
Switch# show mvr interface gigabitethernet0/2
Type: RECEIVER Status: ACTIVE Immediate Leave: DISABLED
```

This is an example of output from the **show mvr interface interface-id members** command:

```
Switch# show mvr interface gigabitethernet0/2 members
239.255.0.0      DYNAMIC ACTIVE
239.255.0.1      DYNAMIC ACTIVE
239.255.0.2      DYNAMIC ACTIVE
239.255.0.3      DYNAMIC ACTIVE
239.255.0.4      DYNAMIC ACTIVE
239.255.0.5      DYNAMIC ACTIVE
239.255.0.6      DYNAMIC ACTIVE
239.255.0.7      DYNAMIC ACTIVE
239.255.0.8      DYNAMIC ACTIVE
239.255.0.9      DYNAMIC ACTIVE
```

#### Related Commands

Command	Description
<b>mvr (global configuration)</b>	Enables and configures multicast VLAN registration on the switch.
<b>mvr (interface configuration)</b>	Configures MVR ports.
<b>show mvr</b>	Displays the global MVR configuration on the switch.
<b>show mvr members</b>	Displays all receiver ports that are members of an MVR multicast group.

# show mvr members

Use the **show mvr members** privileged EXEC command to display all receiver and source ports that are currently members of an IP multicast group.

```
show mvr members [ip-address] [ | {begin | exclude | include} expression]
```

Syntax Description	ip-address	(Optional) The IP multicast address. If the address is entered, all receiver and source ports that are members of the multicast group appear. If no address is entered, all members of all Multicast VLAN Registration (MVR) groups are listed. If a group has no members, the group is listed as Inactive.
	begin	(Optional) Display begins with the line that matches the <i>expression</i> .
	exclude	(Optional) Display excludes lines that match the <i>expression</i> .
	include	(Optional) Display includes lines that match the specified <i>expression</i> .
	expression	Expression in the output to use as a reference point.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

**Usage Guidelines**

The **show mvr members** command applies to receiver and source ports. For MVR-compatible mode, all source ports are members of all multicast groups.

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

**Examples**

This is an example of output from the **show mvr members** command:

```
Switch# show mvr members
MVR Group IP      Status      Members
-----
239.255.0.1      ACTIVE      Gi0/1(d), Gi0/5(s)
239.255.0.2      INACTIVE    None
239.255.0.3      INACTIVE    None
239.255.0.4      INACTIVE    None
239.255.0.5      INACTIVE    None
239.255.0.6      INACTIVE    None
239.255.0.7      INACTIVE    None
239.255.0.8      INACTIVE    None
239.255.0.9      INACTIVE    None
239.255.0.10     INACTIVE    None

<output truncated>
```

This is an example of output from the **show mvr members** *ip-address* command. It displays the members of the IP multicast group with that address:

```
Switch# show mvr members 239.255.0.2
239.255.003.--22      ACTIVE      Gi0/1(d), Gi0/2(d), Gi0/3(d),
                               Gi0/4(d), Gi0/5(s)
```

Related Commands	Command	Description
	<a href="#">mvr (global configuration)</a>	Enables and configures multicast VLAN registration on the switch.
	<a href="#">mvr (interface configuration)</a>	Configures MVR ports.
	<a href="#">show mvr</a>	Displays the global MVR configuration on the switch.
	<a href="#">show mvr interface</a>	Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the <b>members</b> keyword is appended to the command.

# show network-policy profile

Use the **show network policy profile** privileged EXEC command to display the network-policy profiles.

**show network-policy profile** [*profile number*] [**detail**] [ | { **begin** | **exclude** | **include** } *expression*]

Syntax Description	<i>profile number</i>	(Optional) Display the network-policy profile number. If no profile is entered, all network-policy profiles appear.
	<b>detail</b>	(Optional) Display detailed status and statistics information.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(50)SE	This command was introduced.

Examples This is an example of output from the **show network-policy profile** command:

```
Switch# show network-policy profile
Network Policy Profile 10
  voice vlan 17 cos 4
  Interface:
    none
Network Policy Profile 30
  voice vlan 30 cos 5
  Interface:
    none
Network Policy Profile 36
  voice vlan 4 cos 3
  Interface:
    Interface_id
```

Related Commands	Command	Description
	<a href="#">network-policy</a>	Applies a network-policy to an interface.
	<a href="#">network-policy profile (global configuration)</a>	Creates the network-policy profile.
	<a href="#">network-policy profile (network-policy configuration)</a>	Configures the attributes of network-policy profiles.

# show nmosp

Use the **show nmosp** privileged EXEC command to display the Network Mobility Services Protocol (NMSP) information for the switch. This command is available only when your switch is running the cryptographic (encrypted) software image.

```
show nmosp {attachment suppress interface | capability | notification interval | statistics
            {connection | summary} | status | subscription {detail | summary}} [ | {begin | exclude |
            include} expression]
```

Syntax Description		
<b>attachment suppress interface</b>		Display attachment suppress interfaces.
<b>capability</b>		Display switch capabilities including the supported services and subservices.
<b>notification interval</b>		Display the notification intervals of the supported services.
<b>statistics {connection   summary}</b>		Display the NMSP statistics information. <ul style="list-style-type: none"> <li>• <b>connection</b>—display the message counters on each connection.</li> <li>• <b>summary</b>—display the global counters.</li> </ul>
<b>status</b>		Display information about the NMSP connections.
<b>subscription {detail   summary}</b>		Display the subscription information on each NMSP connection. <ul style="list-style-type: none"> <li>• <b>detail</b>—display all services and subservices subscribed on each connection.</li> <li>• <b>summary</b>—display all services subscribed on each connection.</li> </ul>
<b>  begin</b>		(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>		(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>		(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>		Expression in the output to use as a reference point.

<b>Command Modes</b>	Privileged EXEC
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Command History	Release	Modification
	12.2(50)SE	This command was introduced.

**Examples** This is an example of output from the **show nmosp attachment suppress interface** command:

```
Switch# show nmosp attachment suppress interface
NMSP Attachment Suppression Interfaces
-----
GigabitEthernet1/1
GigabitEthernet1/2
```

This is an example of output from the **show nmosp capability** command:

```
Switch# show nmosp capability
NMSP Switch Capability
```



```

-----
Service           Subservice
-----
Attachment        Wired Station
Location           Subscription

```

This is an example of output from the **show nmsp notification interval** command:

```

Switch# show nmsp notification interval
NMSP Notification Intervals
-----
Attachment notify interval: 30 sec (default)
Location notify interval: 30 sec (default)

```

This is an example of output from the **show nmsp statistics connection** and **show nmsp statistics summary** commands:

```

Switch# show nmsp statistics connection
NMSP Connection Counters
-----
Connection 1:
  Connection status: UP
  Freed connection: 0

  Tx message count      Rx message count
  -----
  Subscr Resp: 1        Subscr Req: 1
  Capa Notif: 1         Capa Notif: 1
  Atta Resp: 1          Atta Req: 1
  Atta Notif: 0
  Loc Resp: 1           Loc Req: 1
  Loc Notif: 0
  Unsupported msg: 0

Switch# show nmsp statistics summary
NMSP Global Counters
-----
  Send too big msg: 0
  Failed socket write: 0
  Partial socket write: 0
  Socket write would block: 0
  Failed socket read: 0
  Socket read would block: 0
  Transmit Q full: 0
  Max Location Notify Msg: 0
  Max Attachment Notify Msg: 0
  Max Tx Q Size: 0

```

This is an example of output from the **show nmsp status** command:

```

Switch# show nmsp status
NMSP Status
-----
NMSP: enabled
MSE IP Address      TxEchoResp RxEchoReq TxData RxData
172.19.35.109      5 5 4 4

```

This is an example of output from the **show nmsp show subscription detail** and the **show nmsp show subscription summary** commands:

```
Switch# show nmsp subscription detail
Mobility Services Subscribed by 172.19.35.109:
Services                Subservices
-----
Attachment:            Wired Station
Location:               Subscription

Switch# show nmsp subscription summary
Mobility Services Subscribed:
MSE IP Address          Services
-----
172.19.35.109           Attachment, Location
```

Related Commands	Command	Description
	<a href="#">clear nmsp statistics</a>	Clears the NMSP statistic counters.
	<a href="#">nmsp</a>	Enables Network Mobility Services Protocol (NMSP) on the switch.

# show pagp

Use the **show pagp** user EXEC command to display Port Aggregation Protocol (PAgP) channel-group information.

```
show pagp [channel-group-number] {counters | dual-active | internal | neighbor} [ | {begin | exclude | include} expression]
```

Syntax Description	
<i>channel-group-number</i>	(Optional) Number of the channel group. The range is 1 to 12.
<b>counters</b>	Display traffic information.
<b>dual-active</b>	Display the dual-active status.
<b>internal</b>	Display internal information.
<b>neighbor</b>	Display neighbor information.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
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Command History	Release	Modification
	12.2(25)SEE	This command was introduced.
	12.2(46)SE	The <b>dual-active</b> keyword was added.
	12.2(50)SE	The <i>channel-group-number</i> range was incorrect. The correct range is from 1 to 12.

**Usage Guidelines** You can enter any **show pagp** command to display the active channel-group information. To display the nonactive information, enter the **show pagp** command with a channel-group number.

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

**Examples** This is an example of output from the **show pagp 1 counters** command:

```
Switch> show pagp 1 counters
          Information      Flush
Port      Sent   Recv      Sent   Recv
-----
Channel group: 1
Gi0/1      45     42         0       0
Gi0/2      45     41         0       0
Gi0/11     45     42         0       0
Gi0/12     45     41         0       0
```

## show pagp

This is an example of output from the **show pagp 1 internal** command:

```
Switch> show pagp 1 internal
Flags: S - Device is sending Slow hello. C - Device is in Consistent state.
      A - Device is in Auto mode.
Timers: H - Hello timer is running.      Q - Quit timer is running.
        S - Switching timer is running.   I - Interface timer is running.
```

Channel group 1

Port	Flags	State	Timers	Hello Interval	Partner Count	PAGP Priority	Learning Method	Group Ifindex
Gi0/1	SC	U6/S7	H	30s	1	128	Any	16
Gi0/2	SC	U6/S7	H	30s	1	128	Any	16
Gi0/11	SC	U6/S7	H	30s	1	128	Any	16
Gi0/12	SC	U6/S7	H	30s	1	128	Any	16

This is an example of output from the **show pagp 1 neighbor** command:

```
Switch> show pagp 1 neighbor
Flags: S - Device is sending Slow hello. C - Device is in Consistent state.
      A - Device is in Auto mode.      P - Device learns on physical port.
```

Channel group 1 neighbors

Port	Partner Name	Partner Device ID	Partner Port	Partner Age	Partner Flags	Partner Group Cap.
Gi0/1	switch-p2	0002.4b29.4600	Gi01//1	9s	SC	10001
Gi0/2	switch-p2	0002.4b29.4600	Gi1/0/2	24s	SC	10001
Gi0/11	switch-p2	0002.4b29.4600	Gi0/11	9s	SC	10001
Gi0/12	switch-p2	0002.4b29.4600	Gi0/12	24s	SC	10001

This is an example of output from the **show pagp dual-active** command:

```
Switch> show pagp dual-active
PAGP dual-active detection enabled: Yes
PAGP dual-active version: 1.1
```

Channel group 1

Port	Dual-Active Detect Capable	Partner Name	Partner Port	Partner Version
Gi0/1	No	Switch	Gi0/3	N/A
Gi0/2	No	Switch	Gi0/4	N/A

<output truncated>

## Related Commands

Command	Description
<a href="#">clear pagp</a>	Clears PAGP channel-group information.

# show parser macro

Use the **show parser macro** user EXEC command to display the parameters for all configured macros or for one macro on the switch.

**show parser macro** [{**brief** | **description** [**interface** *interface-id*] | **name** *macro-name*}] [ | {**begin** | **exclude** | **include**} *expression*]

Syntax Description	
<b>brief</b>	(Optional) Display the name of each macro.
<b>description</b> [ <b>interface</b> <i>interface-id</i> ]	(Optional) Display all macro descriptions or the description of a specific interface.
<b>name</b> <i>macro-name</i>	(Optional) Display information about a single macro identified by the macro name.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes	User EXEC
---------------	-----------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

Examples	This is a partial output example from the <b>show parser macro</b> command. The output for the Cisco-default macros varies depending on the switch platform and the software image running on the switch:
----------	---

```
Switch# show parser macro
Total number of macros = 6
-----
Macro name : cisco-global
Macro type : default global
# Enable dynamic port error recovery for link state
# failures
errdisable recovery cause link-flap
errdisable recovery interval 60
```

<output truncated>

```
-----
Macro name : cisco-desktop
Macro type : default interface
# macro keywords $AVID
# Basic interface - Enable data VLAN only
```

```
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access
```

<output truncated>

```
-----
Macro name : cisco-phone
Macro type : default interface
# Cisco IP phone + desktop template
# macro keywords $AVID $VVID
# VoIP enabled interface - Enable data VLAN
# and voice VLAN (VVID)
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access
```

<output truncated>

```
-----
Macro name : cisco-switch
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Do not apply to EtherChannel/Port Group
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID
```

<output truncated>

```
-----
Macro name : cisco-router
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID
```

<output truncated>

```
-----
Macro name : snmp
Macro type : customizable
```

```
#enable port security, linkup, and linkdown traps
snmp-server enable traps port-security
snmp-server enable traps linkup
snmp-server enable traps linkdown
#set snmp-server host
snmp-server host ADDRESS
#set SNMP trap notifications precedence
snmp-server ip precedence VALUE
-----
```

This is an example of output from the **show parser macro name** command:

```
Switch# show parser macro name standard-switch10
Macro name : standard-switch10
Macro type : customizable
macro description standard-switch10
# Trust QoS settings on VOIP packets
auto qos voip trust
# Allow port channels to be automatically formed
channel-protocol pagp
```

This is an example of output from the **show parser macro brief** command:

```
Switch# show parser macro brief
default global : cisco-global
default interface: cisco-desktop
default interface: cisco-phone
default interface: cisco-switch
default interface: cisco-router
customizable : snmp
```

This is an example of output from the **show parser macro description** command:

```
Switch# show parser macro description
Global Macro(s): cisco-global
Interface Macro Description(s)
-----
Gi0/1 standard-switch10
Gi0/2 this is test macro
-----
```

This is an example of output from the **show parser macro description interface** command:

```
Switch# show parser macro description interface gigabitethernet0/2
Interface Macro Description
-----
Gi0/2 this is test macro
-----
```

## Related Commands

Command	Description
<a href="#">macro apply</a>	Applies a macro on an interface or applies and traces a macro on an interface.
<a href="#">macro description</a>	Adds a description about the macros that are applied to an interface.
<a href="#">macro global</a>	Applies a macro on a switch or applies and traces a macro on a switch.
<a href="#">macro global description</a>	Adds a description about the macros that are applied to the switch.
<a href="#">macro name</a>	Creates a macro.
<a href="#">show running-config</a>	Displays the current operating configuration, including defined macros. For syntax information, select <b>Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 &gt; File Management Commands &gt; Configuration File Management Commands</b> .

# show policy-map

Use the **show policy-map** user EXEC command to display quality of service (QoS) policy maps, which define classification criteria for incoming traffic. Policy maps can include policers that specify the bandwidth limitations and the action to take if the limits are exceeded.

```
show policy-map [policy-map-name [class class-map-name]] [ | {begin | exclude | include}
expression]
```

Syntax Description

<i>policy-map-name</i>	(Optional) Display the specified policy-map name.
<b>class</b> <i>class-map-name</i>	(Optional) Display QoS policy actions for a individual class.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

  
**Note**

Though visible in the command-line help string, the **control-plane** and **interface** keywords are not supported, and the statistics shown in the display should be ignored.

Command Modes

User EXEC

Command History

Release	Modification
12.2(25)SEE	This command was introduced.

Usage Guidelines

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

Examples

This is an example of output from the **show policy-map** command:

```
Switch> show policy-map
Policy Map videowizard_policy2
  class videowizard_10-10-10-10
    set dscp 34
    police 1000000000 2000000 exceed-action drop

Policy Map mypolicy
  class dscp5
    set dscp 6
```



Related Commands	Command	Description
	<a href="#">policy-map</a>	Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.

# show port-security

Use the **show port-security** privileged EXEC command to display port-security settings for an interface or for the switch.

```
show port-security [interface interface-id] [address | vlan] [ | {begin | exclude | include}
expression]
```

## Syntax Description

<b>interface</b> <i>interface-id</i>	(Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, module, and port number).
<b>address</b>	(Optional) Display all secure MAC addresses on all ports or a specified port.
<b>vlan</b>	(Optional) Display port security settings for all VLANs on the specified interface. This keyword is visible only on interfaces that have the switchport mode set to <b>trunk</b> .
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

If you enter the command without keywords, the output includes the administrative and operational status of all secure ports on the switch.

If you enter an *interface-id*, the command displays port security settings for the interface.

If you enter the **address** keyword, the command displays the secure MAC addresses for all interfaces and the aging information for each secure address.

If you enter an *interface-id* and the **address** keyword, the command displays all the MAC addresses for the interface with aging information for each secure address. You can also use this command to display all the MAC addresses for an interface even if you have not enabled port security on it.

If you enter the **vlan** keyword, the command displays the configured maximum and the current number of secure MAC addresses for all VLANs on the interface. This option is visible only on interfaces that have the switchport mode set to **trunk**.

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

**Examples**

This is an example of the output from the **show port-security** command:

```
Switch# show port-security
Secure Port      MaxSecureAddr  CurrentAddr  SecurityViolation  Security Action
              (Count)          (Count)          (Count)
-----
      Gi0/1              1              0              0              Shutdown
-----
Total Addresses in System (excluding one mac per port)    : 1
Max Addresses limit in System (excluding one mac per port) : 6272
```

This is an example of output from the **show port-security interface interface-id** command:

```
Switch# show port-security interface gigabitethernet0/1
Port Security : Enabled
Port status : SecureUp
Violation mode : Shutdown
Maximum MAC Addresses : 1
Total MAC Addresses : 0
Configured MAC Addresses : 0
Aging time : 0 mins
Aging type : Absolute
SecureStatic address aging : Disabled
Security Violation count : 0
```

This is an example of output from the **show port-security address** command:

```
Switch# show port-security address
Secure Mac Address Table
-----
Vlan    Mac Address      Type                Ports    Remaining Age
      (mins)
-----
      1    0006.0700.0800    SecureConfigured    Gi0/2      1
-----
Total Addresses in System (excluding one mac per port)    : 1
Max Addresses limit in System (excluding one mac per port) : 6272
```

This is an example of output from the **show port-security interface gigabitethernet0/2 address** command:

```
Switch# show port-security interface gigabitethernet0/2 address
Secure Mac Address Table
-----
Vlan    Mac Address      Type                Ports    Remaining Age
      (mins)
-----
      1    0006.0700.0800    SecureConfigured    Gi0/2      1
-----
Total Addresses: 1
```

This is an example of output from the **show port-security interface interface-id vlan** command:

```
Switch# show port-security interface gigabitethernet0/2 vlan
Default maximum: not set, using 5120
VLAN Maximum Current
   5    default      1
  10    default     54
  11    default    101
  12    default    101
  13    default    201
  14    default    501
```

■ show port-security

Related Commands

Command	Description
<a href="#">clear port-security</a>	Deletes from the MAC address table a specific type of secure address or all the secure addresses on the switch or an interface.
<a href="#">switchport port-security</a>	Enables port security on a port, restricts the use of the port to a user-defined group of stations, and configures secure MAC addresses.

# show sdm prefer

Use the **show sdm prefer** privileged EXEC command to display information about the Switch Database Management (SDM) templates that can be used to maximize used for allocating system resources for a particular feature, or use the command without a keyword to display the template in use.

```
show sdm prefer [access | default | dual-ipv4-and-ipv6 { default | routing | vlan } | routing | vlan ]
[ | {begin | exclude | include} expression]
```

Syntax Description		
<b>access</b>	(Optional)	Display the template that maximizes system resources for ACLs.
<b>default</b>	(Optional)	Display the template that balances system resources among features.
<b>dual-ipv4-and-ipv6</b> { <b>default</b>   <b>routing</b>   <b>vlan</b> }	(Optional)	Display the dual templates that support both IPv4 and IPv6. <ul style="list-style-type: none"> <li><b>default</b>—Display the default dual template configuration.</li> <li><b>routing</b>—Display the routing dual template configuration.</li> <li><b>vlan</b>—Display the VLAN dual template configuration.</li> </ul>
<b>routing</b>	(Optional)	Display the template that maximizes system resources for routing.
<b>vlan</b>	(Optional)	Display the template that maximizes system resources for Layer 2 VLANs.
<b>begin</b>	(Optional)	Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional)	Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional)	Display includes lines that match the specified <i>expression</i> .
<i>expression</i>		Expression in the output to use as a reference point.

<b>Command Modes</b>	Privileged EXEC
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Command History	Release	Modification
	12.2(44)SE	This command was introduced.

**Usage Guidelines**

When you change the SDM template by using the **sdm prefer** global configuration command, you must reload the switch for the configuration to take effect. If you enter the **show sdm prefer** command before you enter the **reload** privileged EXEC command, the **show sdm prefer** command shows the template currently in use and the template that will become active after a reload.

The numbers displayed for each template represent an approximate maximum number for each feature resource. The actual number might vary, depending on the actual number of other features configured.

Although these features are visible in the template in the CLI, the switch does not support IPv4 or IPv6 policy-based routing or IPv6 Qos ACLs.

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

**Examples**

This is an example of output from the **show sdm prefer** command, displaying the template in use:

```
Switch# show sdm prefer
The current template is "desktop default" template.
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          6K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:            8K
  number of directly-connected IPv4 hosts: 6K
  number of indirect IPv4 routes:         2K
number of IPv4 policy based routing aces: 0
number of IPv4/MAC qos aces:             0.75K
number of IPv4/MAC security aces:        1K
```

This is an example of output from the **show sdm prefer routing** command:

```
Switch# show sdm prefer routing
"desktop routing" template:
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          3K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:            11K
  number of directly-connected IPv4 hosts: 3K
  number of indirect IPv4 routes:         8K
number of IPv4 policy based routing aces: 0.5K
number of IPv4/MAC qos aces:             0.75K
number of IPv4/MAC security aces:        1K
```

This is an example of output from the **show sdm prefer dual-ipv4-and-ipv6 default** command:

```
Switch# show sdm prefer dual-ipv4-and-ipv6 default
"desktop IPv4 and IPv6 default" template:
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          2K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:            3K
  number of directly-connected IPv4 hosts: 2K
  number of indirect IPv4 routes:         1K
number of IPv6 multicast groups:          1.125k
number of directly-connected IPv6 addresses: 2K
number of indirect IPv6 unicast routes:    1K
number of IPv4 policy based routing aces: 0
number of IPv4/MAC qos aces:             0.75K
number of IPv4/MAC security aces:        1K
number of IPv6 policy based routing aces: 0
number of IPv6 qos aces:                 0.5K
number of IPv6 security aces:            0.5K
```

This is an example of an output display when you have changed the template and have not reloaded the switch:

```
Switch# show sdm prefer
The current template is "desktop default" template.
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          6K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:           8K
  number of directly-connected IPv4 hosts: 6K
  number of indirect IPv4 routes:         2K
number of IPv4 policy based routing aces: 0
number of IPv4/MAC qos aces:             0.75K
number of IPv4/MAC security aces:        1K

On next reload, template will be "desktop vlan" template.
```

**Related Commands**

Command	Description
<a href="#">sdm prefer</a>	Configures the template used in SDM resource allocation.

# show spanning-tree

Use the **show spanning-tree** user EXEC command to display spanning-tree state information.

```
show spanning-tree [bridge-group | active [detail] | backbonefast | blockedports | bridge | detail
[active] | inconsistentports | interface interface-id | mst | pathcost method | root | summary
[totals] | uplinkfast | vlan vlan-id] [ | { begin | exclude | include } expression]
```

```
show spanning-tree bridge-group [active [detail] | blockedports | bridge | detail [active] |
inconsistentports | interface interface-id | root | summary] [ | { begin | exclude | include }
expression]
```

```
show spanning-tree vlan vlan-id [active [detail] | blockedports | bridge | detail [active] |
inconsistentports | interface interface-id | root | summary] [ | { begin | exclude | include }
expression]
```

```
show spanning-tree { vlan vlan-id | bridge-group } bridge [address | detail | forward-time |
hello-time | id | max-age | priority [system-id] | protocol] [ | { begin | exclude | include }
expression]
```

```
show spanning-tree { vlan vlan-id | bridge-group } root [address | cost | detail | forward-time |
hello-time | id | max-age | port | priority [system-id] [ | { begin | exclude | include }
expression]
```

```
show spanning-tree interface interface-id [active [detail] | cost | detail [active] | inconsistency |
portfast | priority | rootcost | state] [ | { begin | exclude | include } expression]
```

```
show spanning-tree mst [configuration [digest]] | [instance-id | detail | interface interface-id
[detail]] [ | { begin | exclude | include } expression]
```

## Syntax Description

<i>bridge-group</i>	(Optional) Specify the bridge group number. The range is 1 to 255.
<b>active</b> [ <b>detail</b> ]	(Optional) Display spanning-tree information only on active interfaces (available only in privileged EXEC mode).
<b>backbonefast</b>	(Optional) Display spanning-tree BackboneFast status.
<b>blockedports</b>	(Optional) Display blocked port information (available only in privileged EXEC mode).
<b>bridge</b> [ <b>address</b>   <b>detail</b>   <b>forward-time</b>   <b>hello-time</b>   <b>id</b>   <b>max-age</b>   <b>priority</b> [ <b>system-id</b> ]   <b>protocol</b> ]	(Optional) Display status and configuration of this switch (optional keywords available only in privileged EXEC mode).
<b>detail</b> [ <b>active</b> ]	(Optional) Display a detailed summary of interface information ( <b>active</b> keyword available only in privileged EXEC mode).
<b>inconsistentports</b>	(Optional) Display inconsistent port information (available only in privileged EXEC mode).
<b>interface</b> <i>interface-id</i> [ <b>active</b> [ <b>detail</b> ]   <b>cost</b>   <b>detail</b> [ <b>active</b> ]   <b>inconsistency</b>   <b>portfast</b>   <b>priority</b>   <b>rootcost</b>   <b>state</b> ]	(Optional) Display spanning-tree information for the specified interface (all options except <b>portfast</b> and <b>state</b> available only in privileged EXEC mode). Enter each interface separated by a space. Ranges are not supported. Valid interfaces include physical ports, VLANs, and port channels. The VLAN range is 1 to 4094. The port-channel range is 1 to 12.



<b>mst</b> [ <b>configuration</b> [ <b>digest</b> ]] [ <i>instance-id</i> [ <b>detail</b>   <b>interface</b> <i>interface-id</i> [ <b>detail</b> ]]]	<p>(Optional) Display the multiple spanning-tree (MST) region configuration and status (available only in privileged EXEC mode).</p> <p>The keywords have these meanings:</p> <ul style="list-style-type: none"> <li>• <b>digest</b>—(Optional) Display the MD5 digest included in the current MST configuration identifier (MSTCI). Two separate digests, one for standard and one for prestandard switches, appear (available only in privileged EXEC mode).</li> </ul> <p>The terminology was updated for the implementation of the IEEE standard, and the <i>txholdcount</i> field was added.</p> <p>The new master role appears for boundary ports.</p> <p>The word <i>pre-standard</i> or <i>Pre-STD</i> appears when an IEEE standard bridge sends prestandard BPDUs on a port.</p> <p>The word <i>pre-standard (config)</i> or <i>Pre-STD-Cf</i> appears when a port has been configured to transmit prestandard BPDUs and no prestandard BPDU has been received on that port.</p> <p>The word <i>pre-standard (rcvd)</i> or <i>Pre-STD-Rx</i> appears when a prestandard BPDU has been received on a port that has not been configured to transmit prestandard BPDUs.</p> <p>A <i>dispute</i> flag appears when a designated port receives inferior designated information until the port returns to the forwarding state or ceases to be designated.</p> <ul style="list-style-type: none"> <li>• <i>instance-id</i>—You can specify a single instance ID, a range of IDs separated by a hyphen, or a series of IDs separated by a comma. The range is 1 to 4094. The display shows the number of currently configured instances.</li> <li>• <b>interface</b> <i>interface-id</i>—(Optional) Valid interfaces include physical ports, VLANs, and port channels. The VLAN range is 1 to 4094. The port-channel range is 1 to 12.</li> <li>• <b>detail</b>—(Optional) Display detailed information for the instance or interface.</li> </ul>
<b>pathcost method</b>	(Optional) Display the default path cost method (available only in privileged EXEC mode).
<b>root</b> [ <b>address</b>   <b>cost</b>   <b>detail</b>   <b>forward-time</b>   <b>hello-time</b>   <b>id</b>   <b>max-age</b>   <b>port</b>   <b>priority</b> [ <b>system-id</b> ]]	(Optional) Display root switch status and configuration (all keywords available only in privileged EXEC mode).
<b>summary</b> [ <b>totals</b> ]	(Optional) Display a summary of port states or the total lines of the spanning-tree state section. The words <i>IEEE Standard</i> identify the MST version running on a switch.
<b>uplinkfast</b>	(Optional) Display spanning-tree UplinkFast status.
<b>vlan</b> <i>vlan-id</i> [ <b>active</b> [ <b>detail</b> ]   <b>backbonefast</b>   <b>blockedports</b>   <b>bridge</b> [ <b>address</b>   <b>detail</b>   <b>forward-time</b>   <b>hello-time</b>   <b>id</b>   <b>max-age</b>   <b>priority</b> [ <b>system-id</b> ]   <b>protocol</b> ]	(Optional) Display spanning-tree information for the specified VLAN (some keywords available only in privileged EXEC mode). You can specify a single VLAN identified by VLAN ID number, a range of VLANs separated by a hyphen, or a series of VLANs separated by a comma. The range is 1 to 4094.

<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

**Command Modes**

User EXEC

**Command History**

Release	Modification
12.2(25)SEE	This command was introduced.
12.2(50)SE	The <i>channel-group-number</i> range was incorrect. The correct range is from 1 to 12.

**Usage Guidelines**

If the *vlan-id* variable is omitted, the command applies to the spanning-tree instance for all VLANs.

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

**Examples**

This is an example of output from the **show spanning-tree active** command:

```
Switch# show spanning-tree active
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32768
             Address     0001.42e2.cdd0
             Cost        3038
             Port        24 (GigabitEthernet0/1)
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    49153 (priority 49152 sys-id-ext 1)
             Address     0003.fd63.9580
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time   300
  Uplinkfast enabled

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi0/1              Root FWD 3019          128.24  P2p
Gi0/11             Root FWD 3019          128.24  P2p
<output truncated>
```

This is an example of output from the **show spanning-tree detail** command:

```
Switch# show spanning-tree detail
VLAN0001 is executing the ieee compatible Spanning Tree protocol
  Bridge Identifier has priority 49152, sysid 1, address 0003.fd63.9580
  Configured hello time 2, max age 20, forward delay 15
  Current root has priority 32768, address 0001.42e2.cdd0
  Root port is 1 (GigabitEthernet0/1), cost of root path is 3038
  Topology change flag not set, detected flag not set
  Number of topology changes 0 last change occurred 1d16h ago
  Times: hold 1, topology change 35, notification 2
         hello 2, max age 20, forward delay 15
```

```

Timers: hello 0, topology change 0, notification 0, aging 300
Uplinkfast enabled

Port 1 (GigabitEthernet0/1) of VLAN0001 is forwarding
  Port path cost 3019, Port priority 128, Port Identifier 128.24.
  Designated root has priority 32768, address 0001.42e2.cdd0
  Designated bridge has priority 32768, address 00d0.bbf5.c680
  Designated port id is 128.25, designated path cost 19
  Timers: message age 2, forward delay 0, hold 0
  Number of transitions to forwarding state: 1
  Link type is point-to-point by default
  BPDU: sent 0, received 72364
<output truncated>

```

This is an example of output from the **show spanning-tree interface interface-id** command:

```

Switch# show spanning-tree interface gigabitethernet0/1
Vlan          Role Sts Cost          Prio.Nbr Type
-----
VLAN0001      Root FWD 3019          128.24  P2p

```

```

Switch# show spanning-tree summary
Switch is in pvst mode
Root bridge for: none
EtherChannel misconfiguration guard is enabled
Extended system ID is enabled
Portfast is disabled by default
PortFast BPDU Guard is disabled by default
Portfast BPDU Filter is disabled by default
Loopguard is disabled by default
UplinkFast is enabled
BackboneFast is enabled
Pathcost method used is short

```

Name	Blocking	Listening	Learning	Forwarding	STP Active
VLAN0001	1	0	0	11	12
VLAN0002	3	0	0	1	4
VLAN0004	3	0	0	1	4
VLAN0006	3	0	0	1	4
VLAN0031	3	0	0	1	4
VLAN0032	3	0	0	1	4
<output truncated>					
37 vlans	109	0	0	47	156

Station update rate set to 150 packets/sec.

```

UplinkFast statistics
-----
Number of transitions via uplinkFast (all VLANs) : 0
Number of proxy multicast addresses transmitted (all VLANs) : 0

```

```

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

```

This is an example of output from the **show spanning-tree mst configuration** command:

```
Switch# show spanning-tree mst configuration
Name      [region1]
Revision  1
Instance  Vlans Mapped
-----
0          1-9,21-4094
1          10-20
-----
```

This is an example of output from the **show spanning-tree mst interface interface-id** command:

```
Switch# show spanning-tree mst interface gigabitethernet0/1
GigabitEthernet0/1 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 (STP) bpdu guard : disable (default)
Bpdus sent 5, received 74

Instance role state cost prio vlans mapped
0 root FWD 200000 128 1,12,14-4094
```

This is an example of output from the **show spanning-tree mst 0** command:

```
Switch# show spanning-tree mst 0
##### MST00 vlans mapped: 1-9,21-4094
Bridge address 0002.4b29.7a00 priority 32768 (32768 sysid 0)
Root address 0001.4297.e000 priority 32768 (32768 sysid 0)
port Gi0/1 path cost 200038
port Gi0/21 path cost 200038
IST master *this switch
Operational hello time 2, forward delay 15, max age 20, max hops 20
Configured hello time 2, forward delay 15, max age 20, max hops 20

Interface role state cost prio type
-----
GigabitEthernet0/1 root FWD 200000 128 P2P bound(STP)
GigabitEthernet0/2 desg FWD 200000 128 P2P bound(STP)
GigabitEthernet0/1 root FWD 200000 128 P2P bound(STP)
GigabitEthernet0/2 desg FWD 200000 128 P2P bound(STP)
Port-channel1 desg FWD 200000 128 P2P bound(STP)
```

## Related Commands

Command	Description
<a href="#">clear spanning-tree counters</a>	Clears the spanning-tree counters.
<a href="#">clear spanning-tree detected-protocols</a>	Restarts the protocol migration process.
<a href="#">spanning-tree backbonefast</a>	Enables the BackboneFast feature.
<a href="#">spanning-tree bpduguard</a>	Prevents an interface from sending or receiving bridge protocol data units (BPDUs).
<a href="#">spanning-tree bpduguard</a>	Puts an interface in the error-disabled state when it receives a BPDU.
<a href="#">spanning-tree cost</a>	Sets the path cost for spanning-tree calculations.
<a href="#">spanning-tree extend system-id</a>	Enables the extended system ID feature.
<a href="#">spanning-tree guard</a>	Enables the root guard or the loop guard feature for all the VLANs associated with the selected interface.
<a href="#">spanning-tree link-type</a>	Overrides the default link-type setting for rapid spanning-tree transitions to the forwarding state.

Command	Description
<b>spanning-tree loopguard default</b>	Prevents alternate or root ports from becoming the designated port because of a failure that leads to a unidirectional link.
<b>spanning-tree mst configuration</b>	Enters multiple spanning-tree (MST) configuration mode through which the MST region configuration occurs.
<b>spanning-tree mst cost</b>	Sets the path cost for MST calculations.
<b>spanning-tree mst forward-time</b>	Sets the forward-delay time for all MST instances.
<b>spanning-tree mst hello-time</b>	Sets the interval between hello BPDUs sent by root switch configuration messages.
<b>spanning-tree mst max-age</b>	Sets the interval between messages that the spanning tree receives from the root switch.
<b>spanning-tree mst max-hops</b>	Sets the number of hops in an MST region before the BPDU is discarded and the information held for an interface is aged.
<b>spanning-tree mst port-priority</b>	Configures an interface priority.
<b>spanning-tree mst priority</b>	Configures the switch priority for the specified spanning-tree instance.
<b>spanning-tree mst root</b>	Configures the MST root switch priority and timers based on the network diameter.
<b>spanning-tree port-priority</b>	Configures an interface priority.
<b>spanning-tree portfast (global configuration)</b>	Globally enables the BPDU filtering or the BPDU guard feature on Port Fast-enabled interfaces or enables the Port Fast feature on all nontrunking interfaces.
<b>spanning-tree portfast (interface configuration)</b>	Enables the Port Fast feature on an interface and all its associated VLANs.
<b>spanning-tree uplinkfast</b>	Accelerates the choice of a new root port when a link or switch fails or when the spanning tree reconfigures itself.
<b>spanning-tree vlan</b>	Configures spanning tree on a per-VLAN basis.

# show storm-control

Use the **show storm-control** user EXEC command to display broadcast, multicast, or unicast storm control settings on the switch or on the specified interface or to display storm-control history.

**show storm-control** [*interface-id*] [**broadcast** | **multicast** | **unicast**] [ | { **begin** | **exclude** | **include** } *expression*]

## Syntax Description

<i>interface-id</i>	(Optional) Interface ID for the physical port (including type, module, and port number).
<b>broadcast</b>	(Optional) Display broadcast storm threshold setting.
<b>multicast</b>	(Optional) Display multicast storm threshold setting.
<b>unicast</b>	(Optional) Display unicast storm threshold setting.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

When you enter an *interface-id*, the storm control thresholds appear for the specified interface.

If you do not enter an *interface-id*, settings appear for one traffic type for all ports on the switch.

If you do not enter a traffic type, settings appear for broadcast storm control.

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

## Examples

This is an example of a partial output from the **show storm-control** command when no keywords are entered. Because no traffic-type keyword was entered, the broadcast storm control settings appear.

```
Switch> show storm-control
Interface  Filter State  Upper      Lower      Current
-----
Gi0/1     Forwarding    20 pps     10 pps     5 pps
Gi0/2     Forwarding    50.00%     40.00%     0.00%
<output truncated>
```

This is an example of output from the **show storm-control** command for a specified interface. Because no traffic-type keyword was entered, the broadcast storm control settings appear.

```
Switch> show storm-control gigabitethernet 0/1
Interface    Filter State  Upper      Lower      Current
-----
Gi0/1        Forwarding    20 pps     10 pps     5 pps
```

Table 2-31 describes the fields in the **show storm-control** display.

**Table 2-31** *show storm-control Field Descriptions*

Field	Description
Interface	Displays the ID of the interface.
Filter State	Displays the status of the filter: <ul style="list-style-type: none"> <li>Blocking—Storm control is enabled, and a storm has occurred.</li> <li>Forwarding—Storm control is enabled, and no storms have occurred.</li> <li>Inactive—Storm control is disabled.</li> </ul>
Upper	Displays the rising suppression level as a percentage of total available bandwidth in packets per second or in bits per second.
Lower	Displays the falling suppression level as a percentage of total available bandwidth in packets per second or in bits per second.
Current	Displays the bandwidth usage of broadcast traffic or the specified traffic type (broadcast, multicast, or unicast) as a percentage of total available bandwidth. This field is only valid when storm control is enabled.

#### Related Commands

Command	Description
<a href="#">storm-control</a>	Sets the broadcast, multicast, or unicast storm control levels for the switch.

# show system mtu

Use the **show system mtu** privileged EXEC command to display the global maximum transmission unit (MTU) or maximum packet size set for the switch.

**show system mtu** [ **| {begin | exclude | include}** *expression* ]

## Syntax Description

<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

If you have used the **system mtu** or **system mtu jumbo** global configuration command to change the MTU setting, the new setting does not take effect until you reset the switch.

The system MTU refers to ports operating at 10/100 Mb/s; the system jumbo MTU refers to Gigabit ports; the system routing MTU refers to routed ports.

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

## Examples

This is an example of output from the **show system mtu** command:

```
Switch# show system mtu
System MTU size is 1500 bytes
System Jumbo MTU size is 1550 bytes
Routing MTU size is 1500 bytes.
```

## Related Commands

Command	Description
<a href="#">system mtu</a>	Sets the MTU size for the Fast Ethernet, Gigabit Ethernet, or routed ports.



# show uddld

Use the **show uddld** user EXEC command to display UniDirectional Link Detection (UDLD) administrative and operational status for all ports or the specified port.

**show uddld** [*interface-id*] [ | { **begin** | **exclude** | **include** } *expression*]

<b>Syntax Description</b>	<i>interface-id</i>	(Optional) ID of the interface and port number. Valid interfaces include physical ports and VLANs. The VLAN range is 1 to 4094.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

<b>Usage Guidelines</b>	<p>If you do not enter an <i>interface-id</i>, administrative and operational UDLD status for all interfaces appear. Expressions are case sensitive. For example, if you enter   <b>exclude output</b>, the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.</p>
-------------------------	--

<b>Examples</b>	<p>This is an example of output from the <b>show uddld interface-id</b> command. For this display, UDLD is enabled on both ends of the link, and UDLD detects that the link is bidirectional.</p>
-----------------	---

```
Switch> show uddld gigabitethernet0/1
Interface gi0/1
---
Port enable administrative configuration setting: Follows device default
Port enable operational state: Enabled
Current bidirectional state: Bidirectional
Current operational state: Advertisement - Single Neighbor detected
Message interval: 60
Time out interval: 5
  Entry 1
    Expiration time: 146
    Device ID: 1
    Current neighbor state: Bidirectional
    Device name: Switch-A
    Port ID: Gi0/1
    Neighbor echo 1 device: Switch-B
    Neighbor echo 1 port: Gi0/2
    Message interval: 5
    CDP Device name: Switch-A
```

Table 2-32 describes the fields in this display.

**Table 2-32** *show udd Field Descriptions*

Field	Description
Interface	The interface on the local device configured for UDLD.
Port enable administrative configuration setting	How UDLD is configured on the port. If UDLD is enabled or disabled, the port enable configuration setting is the same as the operational enable state. Otherwise, the enable operational setting depends on the global enable setting.
Port enable operational state	Operational state that shows whether UDLD is actually running on this port.
Current bidirectional state	The bidirectional state of the link. An unknown state appears if the link is down or if it is connected to an UDLD-incapable device. A bidirectional state appears if the link is a normal two-way connection to a UDLD-capable device. All other values mean miswiring.
Current operational state	The current phase of the UDLD state machine. For a normal bidirectional link, the state machine is most often in the Advertisement phase.
Message interval	How often advertisement messages are sent from the local device. Measured in seconds.
Time out interval	The time period, in seconds, that UDLD waits for echoes from a neighbor device during the detection window.
Entry 1	Information from the first cache entry, which contains a copy of echo information received from the neighbor.
Expiration time	The amount of time in seconds remaining before this cache entry is aged out.
Device ID	The neighbor device identification.
Current neighbor state	The neighbor's current state. If both the local and neighbor devices are running UDLD normally, the neighbor state and local state should be bidirectional. If the link is down or the neighbor is not UDLD-capable, no cache entries appear.
Device name	The device name or the system serial number of the neighbor. The system serial number appears if the device name is not set or is set to the default (Switch).
Port ID	The neighbor port ID enabled for UDLD.
Neighbor echo 1 device	The device name of the neighbors' neighbor from which the echo originated.
Neighbor echo 1 port	The port number ID of the neighbor from which the echo originated.
Message interval	The rate, in seconds, at which the neighbor is sending advertisement messages.
CDP device name	The CDP device name or the system serial number. The system serial number appears if the device name is not set or is set to the default (Switch).

Related Commands	Command	Description
	<b>uddld</b>	Enables aggressive or normal mode in UDLD or sets the configurable message timer time.
	<b>uddld port</b>	Enables UDLD on an individual interface or prevents a fiber-optic interface from being enabled by the <b>uddld</b> global configuration command.
	<b>uddld reset</b>	Resets all interfaces shutdown by UDLD and permits traffic to begin passing through them again.

# show version

Use the **show version** user EXEC command to display version information for the hardware and firmware.

**show version** [ | { **begin** | **exclude** | **include** } *expression*]

## Syntax Description

<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

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

## Examples

This is an example of output from the **show version** command:



### Note

Though visible in the **show version** output, the *configuration register* information is not supported on the switch.

```
switch# show version
Cisco IOS Software, CBS30X0 Software (CBS30X0-LANBASE-M), Version 12.2(25)SEE, RELEASE
SOFTWARE (fc1) Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Sat 28-Jan-06 02:55 by antonino Image text-base: 0x00003000, data-base:
0x00A9CD8C
```

```
ROM: Bootstrap program is CBS30X0 boot loader
BOOTLDR: CBS30X0 Boot Loader (CBS3030-HBOOT-M), Version 12.2 [jidai-loader-release 100]
```

```
alexv-cbs3030-p2 uptime is 1 minute
System returned to ROM by power-on
System image file is "flash:cbs30x0-lanbase-mz.122-25.SEE bin"
```

```
cisco WS-CBS3030-DEL (PowerPC405) processor with 118784K/12280K bytes of memory.
Processor board ID FSJC0523550
Last reset from power-on
2 Virtual Ethernet interfaces
16 Gigabit Ethernet interfaces
The password-recovery mechanism is enabled.
```

```
512K bytes of flash-simulated non-volatile configuration memory.
```

```

Base ethernet MAC Address      : 00:15:FA:7D:17:80
Motherboard assembly number    : 73-10292-03
Motherboard serial number      : FHH094400GN
Model number                   : WS-CBS3030-DEL-F
System serial number           : FSJC0523550
Version ID                     : V01
Hardware Board Revision Number : 0x01
    
```

Switch	Ports	Model	SW Version	SW Image
-----	-----	-----	-----	-----
* 1	16	WS-CBS3030-DEL	12.2(25)SEE	CBS30X0-LANBASE-M

```

Configuration register is 0xF
    
```

# show vlan

Use the **show vlan** user EXEC command to display the parameters for all configured VLANs or one VLAN (if the VLAN ID or name is specified) on the switch.

```
show vlan [brief | dot1q tag native | id vlan-id | internal usage | mtu | name vlan-name |
private-vlan [type] | remote-span | summary] [ | {begin | exclude | include} expression]
```

Syntax	Description
<b>brief</b>	(Optional) Display one line for each VLAN with the VLAN name, status, and its ports.
<b>dot1q tag native</b>	(Optional) Display the IEEE 802.1Q native VLAN tagging status.
<b>id</b> <i>vlan-id</i>	(Optional) Display information about a single VLAN identified by VLAN ID number. For <i>vlan-id</i> , the range is 1 to 4094.
<b>internal usage</b>	(Optional) Display a list of VLANs being used internally by the switch. These VLANs are always from the extended range (VLAN IDs 1006 to 4094), and you cannot create VLANs with these IDs by using the <b>vlan</b> global configuration command until you remove them from internal use.
<b>mtu</b>	(Optional) Display a list of VLANs and the minimum and maximum transmission unit (MTU) sizes configured on ports in the VLAN.
<b>name</b> <i>vlan-name</i>	(Optional) Display information about a single VLAN identified by VLAN name. The VLAN name is an ASCII string from 1 to 32 characters.
<b>private-vlan</b>	(Optional) Display information about configured private VLANs, including primary and secondary VLAN IDs, type (community, isolated, or primary) and ports belonging to the private VLAN. This keyword is only supported if your switch is running the IP services image, formerly known as the enhanced multilayer image (EMI).
<b>type</b>	(Optional) Display only private VLAN ID and type.
<b>remote-span</b>	(Optional) Display information about Remote SPAN (RSPAN) VLANs.
<b>summary</b>	(Optional) Display VLAN summary information.
<b>  begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>  exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>  include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.



## Note

Though visible in the command-line help string, the **ifindex** keyword is not supported.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.
12.2(44)SE	The <b>private-vlan</b> keywords were added.

**Usage Guidelines**

In the **show vlan mtu** command output, the MTU\_Mismatch column shows whether all the ports in the VLAN have the same MTU. When *yes* appears in this column, it means that the VLAN has ports with different MTUs, and packets that are switched from a port with a larger MTU to a port with a smaller MTU might be dropped. If the VLAN does not have an SVI, the hyphen (-) symbol appears in the SVI\_MTU column. If the MTU-Mismatch column displays *yes*, the names of the port with the MinMTU and the port with the MaxMTU appear.

If you try to associate a private VLAN secondary VLAN with a primary VLAN before you define the secondary VLAN, the secondary VLAN is not included in the **show vlan private-vlan** command output.

In the **show vlan private-vlan type** command output, a type displayed as *normal* means a VLAN that has a private VLAN association but is not part of the private VLAN. For example, if you define and associate two VLANs as primary and secondary VLANs and then delete the secondary VLAN configuration without removing the association from the primary VLAN, the VLAN that was the secondary VLAN is shown as *normal* in the display. In the **show vlan private-vlan** output, the primary and secondary VLAN pair is shown as *non-operational*.

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

**Examples**

This is an example of output from the **show vlan** command. [Table 2-33](#) describes the fields in the display.

```
Switch> show vlan
VLAN Name                                     Status      Ports
-----
1    default                                     active      Gi0/11, Gi0/13, Gi0/14, Gi0/15
                                           Gi0/16
101  VLAN0101                                     active
102  VLAN0102                                     active
103  VLAN0103                                     active
104  VLAN0104                                     active
105  VLAN0105                                     active
106  VLAN0106                                     active
107  VLAN0107                                     active
108  VLAN0108                                     active
109  VLAN0109                                     active
110  VLAN0110                                     active
111  VLAN0111                                     active
112  VLAN0112                                     active
113  VLAN0113                                     active
114  VLAN0114                                     active
115  VLAN0115                                     active
116  VLAN0116                                     active
117  VLAN0117                                     active
118  VLAN0118                                     active
119  VLAN0119                                     active
120  VLAN0120                                     active
121  VLAN0121                                     active
122  VLAN0122                                     active
123  VLAN0123                                     active
124  VLAN0124                                     active
125  VLAN0125                                     active
126  VLAN0126                                     active
127  VLAN0127                                     active
128  VLAN0128                                     active
129  VLAN0129                                     active
130  VLAN0130                                     active
500  VLAN0500                                     active      Gi0/1, Gi0/2, Gi0/3, Gi0/4
                                           Gi0/5, Gi0/6, Gi0/7, Gi0/8
                                           Gi0/9, Gi0/10, Gi0/12
```

## show vlan

```

1002 fddi-default          act/unsup
1003 token-ring-default    act/unsup
1004 fddinet-default       act/unsup
1005 trnet-default         act/unsup

```

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
101	enet	100101	1500	-	-	-	-	-	0	0
102	enet	100102	1500	-	-	-	-	-	0	0
103	enet	100103	1500	-	-	-	-	-	0	0
104	enet	100104	1500	-	-	-	-	-	0	0
105	enet	100105	1500	-	-	-	-	-	0	0
106	enet	100106	1500	-	-	-	-	-	0	0
107	enet	100107	1500	-	-	-	-	-	0	0
108	enet	100108	1500	-	-	-	-	-	0	0
109	enet	100109	1500	-	-	-	-	-	0	0
110	enet	100110	1500	-	-	-	-	-	0	0
111	enet	100111	1500	-	-	-	-	-	0	0
112	enet	100112	1500	-	-	-	-	-	0	0
113	enet	100113	1500	-	-	-	-	-	0	0
114	enet	100114	1500	-	-	-	-	-	0	0
115	enet	100115	1500	-	-	-	-	-	0	0
116	enet	100116	1500	-	-	-	-	-	0	0
117	enet	100117	1500	-	-	-	-	-	0	0
118	enet	100118	1500	-	-	-	-	-	0	0
119	enet	100119	1500	-	-	-	-	-	0	0
120	enet	100120	1500	-	-	-	-	-	0	0
121	enet	100121	1500	-	-	-	-	-	0	0
122	enet	100122	1500	-	-	-	-	-	0	0
123	enet	100123	1500	-	-	-	-	-	0	0
124	enet	100124	1500	-	-	-	-	-	0	0
125	enet	100125	1500	-	-	-	-	-	0	0
126	enet	100126	1500	-	-	-	-	-	0	0
127	enet	100127	1500	-	-	-	-	-	0	0
128	enet	100128	1500	-	-	-	-	-	0	0
129	enet	100129	1500	-	-	-	-	-	0	0
130	enet	100130	1500	-	-	-	-	-	0	0
500	enet	100500	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	srb	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

Remote SPAN VLANs

Primary Secondary Type Ports

**Table 2-33** show vlan Command Output Fields

Field	Description
VLAN	VLAN number.
Name	Name, if configured, of the VLAN.



**Table 2-33** *show vlan Command Output Fields (continued)*

Field	Description
Status	Status of the VLAN (active or suspend).
Ports	Ports that belong to the VLAN.
Type	Media type of the VLAN.
SAID	Security association ID value for the VLAN.
MTU	Maximum transmission unit size for the VLAN.
Parent	Parent VLAN, if one exists.
RingNo	Ring number for the VLAN, if applicable.
BrdgNo	Bridge number for the VLAN, if applicable.
Stp	Spanning Tree Protocol type used on the VLAN.
BrdgMode	Bridging mode for this VLAN—possible values are source-route bridging (SRB) and source-route transparent (SRT); the default is SRB.
Trans1	Translation bridge 1.
Trans2	Translation bridge 2.
Remote SPAN VLANs	Identifies any RSPAN VLANs that have been configured.
Primary/Secondary/ Type/Ports	Includes any private VLANs that have been configured, including the primary VLAN ID, the secondary VLAN ID, the type of secondary VLAN (community or isolated), and the ports that belong to it.

This is an example of output from the **show vlan dot1q tag native** command:

```
Switch> show vlan dot1q tag native
dot1q native vlan tagging is disabled
```

This is an example of output from the **show vlan private-vlan** command:

```
Switch> show vlan private-vlan
Primary Secondary Type Ports
-----
10      501      isolated      Gi3/0/3
10      502      community     Fa2/0/11
10      503      non-operational3  -
20      25      isolated      Fa1/0/13, Fa1/0/20, Fa1/0/22, Gi1/0/1, Fa2/0/13,
Fa2/0/22, Fa3/0/13, Fa3/0/14, Fa3/0/20, Gi3/0/1
20      30      community     Fa1/0/13, Fa1/0/20, Fa1/0/21, Gi1/0/1, Fa2/0/13,
Fa2/0/20, Fa3/0/14, Fa3/0/20, Fa3/0/21, Gi3/0/1
20      35      community     Fa1/0/13, Fa1/0/20, Fa1/0/23, Fa1/0/33. Gi1/0/1,
Fa2/0/13, Fa3/0/14, Fa3/0/20. Fa3/0/23, Fa3/0/33,
Gi3/0/1
20      55      non-operational
2000    2500    isolated      Fa1/0/5, Fa1/0/10, Fa2/0/5, Fa2/0/10, Fa2/0/15
```

This is an example of output from the **show vlan private-vlan type** command:

```
Switch> show vlan private-vlan type
Vlan Type
-----
10      primary
501      isolated
502      community
503      normal
```

This is an example of output from the **show vlan summary** command:

```
Switch> show vlan summary
Number of existing VLANs      : 45
Number of existing VTP VLANs  : 45
Number of existing extended VLANs : 0
Number of existing VLANs      : 8
Number of existing VTP VLANs  : 8
Number of existing extended VLANs : 0
```

This is an example of output from the **show vlan id** command.

```
Switch# show vlan id 2
VLAN Name                Status    Ports
-----
2    VLAN0200              active    Fa0/7, Fa0/8
2    VLAN0200              active    Gi0/1, Gi0/2

VLAN Type  SAID      MTU    Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----
2    enet    100002    1500    -      -      -      -    -        0      0

Remote SPAN VLAN
-----
Disabled

Switch# show vlan id 1
VLAN Name                Status    Ports
-----
1    default              active    Gi0/1, Gi0/2, Gi0/3, Gi0/4
                                           Gi0/5, Gi0/6, Gi0/7, Gi0/8
                                           Gi0/9, Gi0/10, Gi0/11, Gi0/12
                                           Gi0/13, Gi0/14, Gi0/15, Gi0/16
                                           Gi0/17, Gi0/18

VLAN Type  SAID      MTU    Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----
1    enet    100001    1500    -      -      -      -    -        0      0

Remote SPAN VLAN
-----
Disabled

Primary Secondary Type          Ports
-----
```

This is an example of output from the **show vlan internal usage** command. It shows that VLANs 1025 and 1026 are being used as internal VLANs for Fast Ethernet routed ports 23 and 24 on stack member 1. If you want to use one of these VLAN IDs, you must first shut down the routed port, which releases the internal VLAN, and then create the extended-range VLAN. When you start up the routed port, another internal VLAN number is assigned to it.

```
Switch> show vlan internal usage
VLAN Usage
-----
1025 FastEthernet1/0/23
1026 FastEthernet1/0/24
```

Related Commands	Command	Description
	<a href="#">private-vlan</a>	Configures a VLAN as a community, isolated, or primary VLAN or associates a primary VLAN with secondary VLANs.
	<a href="#">switchport mode</a>	Configures the VLAN membership mode of a port.
	<a href="#">vlan (global configuration)</a>	Enables VLAN configuration mode where you can configure VLANs 1 to 4094.
	<a href="#">vlan (VLAN configuration)</a>	Configures VLAN characteristics in the VLAN database. Only available for normal-range VLANs (VLAN IDs 1 to 1005). Do not enter leading zeros.

# show vlan access-map

Use the **show vlan access-map** privileged EXEC command to display information about a particular VLAN access map or for all VLAN access maps.

```
show vlan access-map [mapname] [ | { begin | exclude | include } expression]
```

Syntax Description	mapname	(Optional) Name of a specific VLAN access map.
	begin	(Optional) Display begins with the line that matches the <i>expression</i> .
	exclude	(Optional) Display excludes lines that match the <i>expression</i> .
	include	(Optional) Display includes lines that match the specified <i>expression</i> .
	expression	Expression in the output to use as a reference point.

Command Modes	Privileged EXEC
---------------	-----------------

Command History	Release	Modification
	12.2(25)SEE	This command was introduced.

Usage Guidelines	Expressions are case sensitive. For example, if you enter   <b>exclude output</b> , the lines that contain <i>output</i> do not appear, but the lines that contain <i>Output</i> appear.
------------------	--

Examples	<p>This is an example of output from the <b>show vlan access-map</b> command:</p> <pre>Switch# show vlan access-map Vlan access-map "SecWiz" 10   Match clauses:     ip address: SecWiz_Gi0_3_in_ip     ip address: SecWiz_Fa10_3_in_ip    Action:     forward</pre>
----------	--

Related Commands	Command	Description
	<a href="#">show vlan filter</a>	Displays information about all VLAN filters or about a particular VLAN or VLAN access map.
	<a href="#">vlan access-map</a>	Creates a VLAN map entry for VLAN packet filtering.
	<a href="#">vlan filter</a>	Applies a VLAN map to one or more VLANs.

# show vlan filter

Use the **show vlan filter** privileged EXEC command to display information about all VLAN filters or about a particular VLAN or VLAN access map.

**show vlan filter** [**access-map** *name* | **vlan** *vlan-id*] [ | { **begin** | **exclude** | **include** } *expression*]

## Syntax Description

<b>access-map</b> <i>name</i>	(Optional) Display filtering information for the specified VLAN access map.
<b>vlan</b> <i>vlan-id</i>	(Optional) Display filtering information for the specified VLAN. The range is 1 to 4094.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

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

## Examples

This is an example of output from the **show vlan filter** command:

```
Switch# show vlan filter
VLAN Map map_1 is filtering VLANs:
 20-22
```

## Related Commands

Command	Description
<a href="#">show vlan access-map</a>	Displays information about a particular VLAN access map or for all VLAN access maps.
<a href="#">vlan access-map</a>	Creates a VLAN map entry for VLAN packet filtering.
<a href="#">vlan filter</a>	Applies a VLAN map to one or more VLANs.

# show vmps

Use the **show vmps** user EXEC command without keywords to display the VLAN Query Protocol (VQP) version, reconfirmation interval, retry count, VLAN Membership Policy Server (VMPS) IP addresses, and the current and primary servers, or use the **statistics** keyword to display client-side statistics.

**show vmps** [**statistics**] [ | { **begin** | **exclude** | **include** } *expression* ]

<b>Syntax Description</b>	<b>statistics</b>	(Optional) Display VQP client-side statistics and counters.
	<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
	<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
	<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
	<i>expression</i>	Expression in the output to use as a reference point.

**Command Modes** User EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(25)SEE	This command was introduced.

**Usage Guidelines** Expressions are case sensitive. For example, if you enter | **exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

**Examples** This is an example of output from the **show vmps** command:

```
Switch> show vmps
VQP Client Status:
-----
VMPS VQP Version: 1
Reconfirm Interval: 60 min
Server Retry Count: 3
VMPS domain server:
```

```
Reconfirmation status
-----
VMPS Action:          other
```

This is an example of output from the **show vmps statistics** command. [Table 2-34](#) describes each field in the display.

```
Switch> show vmps statistics
VMPS Client Statistics
-----
VQP  Queries:                0
VQP  Responses:              0
VMPS  Changes:                0
VQP  Shutdowns:              0
VQP  Denied:                 0
VQP  Wrong Domain:           0
```

```
VQP Wrong Version:          0
VQP Insufficient Resource: 0
```

**Table 2-34** *show vmmps statistics Field Descriptions*

Field	Description
VQP Queries	Number of queries sent by the client to the VMPS.
VQP Responses	Number of responses sent to the client from the VMPS.
VMPS Changes	Number of times that the VMPS changed from one server to another.
VQP Shutdowns	Number of times the VMPS sent a response to shut down the port. The client disables the port and removes all dynamic addresses on this port from the address table. You must administratively re-enable the port to restore connectivity.
VQP Denied	Number of times the VMPS denied the client request for security reasons. When the VMPS response denies an address, no frame is forwarded to or from the workstation with that address (broadcast or multicast frames are delivered to the workstation if the port has been assigned to a VLAN). The client keeps the denied address in the address table as a blocked address to prevent more queries from being sent to the VMPS for each new packet received from this workstation. The client ages the address if no new packets are received from this workstation on this port within the aging time period.
VQP Wrong Domain	Number of times the management domain in the request does not match the one for the VMPS. Any previous VLAN assignments of the port are not changed. This response means that the server and the client have not been configured with the same VTP management domain.
VQP Wrong Version	Number of times the version field in the query packet contains a value that is higher than the version supported by the VMPS. The VLAN assignment of the port is not changed. The switches send only VMPS Version 1 requests.
VQP Insufficient Resource	Number of times the VMPS is unable to answer the request because of a resource availability problem. If the retry limit has not yet been reached, the client repeats the request with the same server or with the next alternate server, depending on whether the per-server retry count has been reached.

■ show vmps

Related Commands	Command	Description
	<a href="#">clear vmps statistics</a>	Clears the statistics maintained by the VQP client.
	<a href="#">vmps reconfirm (privileged EXEC)</a>	Sends VQP queries to reconfirm all dynamic VLAN assignments with the VMPS.
	<a href="#">vmps retry</a>	Configures the per-server retry count for the VQP client.
	<a href="#">vmps server</a>	Configures the primary VMPS and up to three secondary servers.



# show vtp

Use the **show vtp** user EXEC command to display general information about the VLAN Trunking Protocol (VTP) management domain, status, and counters.

**show vtp** {**counters** | **password** | **status**} [ | {**begin** | **exclude** | **include**} *expression*]

## Syntax Description

<b>counters</b>	Display the VTP statistics for the switch.
<b>password</b>	Display the configured VTP password.
<b>status</b>	Display general information about the VTP management domain status.
<b>begin</b>	(Optional) Display begins with the line that matches the <i>expression</i> .
<b>exclude</b>	(Optional) Display excludes lines that match the <i>expression</i> .
<b>include</b>	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

## Command Modes

User EXEC

## Command History

Release	Modification
12.2(25)SEE	This command was introduced.

## Usage Guidelines

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

## Examples

This is an example of output from the **show vtp counters** command. [Table 2-35](#) describes each field in the display.

```
Switch> show vtp counters
```

```
VTP statistics:
Summary advertisements received      : 0
Subset advertisements received      : 0
Request advertisements received     : 0
Summary advertisements transmitted : 0
Subset advertisements transmitted   : 0
Request advertisements transmitted  : 0
Number of config revision errors    : 0
Number of config digest errors      : 0
Number of V1 summary errors         : 0
```

VTP pruning statistics:

Trunk	Join Transmitted	Join Received	Summary advts received from non-pruning-capable device
-----	-----	-----	-----
Fa0/47	0	0	0
Fa0/48	0	0	0
Gi0/1	0	0	0
Gi0/2	0	0	0

**Table 2-35** *show vtp counters Field Descriptions*

Field	Description
Summary advertisements received	Number of summary advertisements received by this switch on its trunk ports. Summary advertisements contain the management domain name, the configuration revision number, the update timestamp and identity, the authentication checksum, and the number of subset advertisements to follow.
Subset advertisements received	Number of subset advertisements received by this switch on its trunk ports. Subset advertisements contain all the information for one or more VLANs.
Request advertisements received	Number of advertisement requests received by this switch on its trunk ports. Advertisement requests normally request information on all VLANs. They can also request information on a subset of VLANs.
Summary advertisements transmitted	Number of summary advertisements sent by this switch on its trunk ports. Summary advertisements contain the management domain name, the configuration revision number, the update timestamp and identity, the authentication checksum, and the number of subset advertisements to follow.
Subset advertisements transmitted	Number of subset advertisements sent by this switch on its trunk ports. Subset advertisements contain all the information for one or more VLANs.
Request advertisements transmitted	Number of advertisement requests sent by this switch on its trunk ports. Advertisement requests normally request information on all VLANs. They can also request information on a subset of VLANs.
Number of configuration revision errors	<p>Number of revision errors.</p> <p>Whenever you define a new VLAN, delete an existing one, suspend or resume an existing VLAN, or modify the parameters on an existing VLAN, the configuration revision number of the switch increments.</p> <p>Revision errors increment whenever the switch receives an advertisement whose revision number matches the revision number of the switch, but the MD5 digest values do not match. These errors mean that the VTP password in the two switches is different or that the switches have different configurations.</p> <p>These errors mean that the switch is filtering incoming advertisements, which causes the VTP database to become unsynchronized across the network.</p>

**Table 2-35** *show vtp counters Field Descriptions (continued)*

Field	Description
Number of configuration digest errors	<p>Number of MD5 digest errors.</p> <p>Digest errors increment whenever the MD5 digest in the summary packet and the MD5 digest of the received advertisement calculated by the switch do not match. This error usually means that the VTP password in the two switches is different. To solve this problem, make sure the VTP password on all switches is the same.</p> <p>These errors mean that the switch is filtering incoming advertisements, which causes the VTP database to become unsynchronized across the network.</p>
Number of V1 summary errors	<p>Number of Version 1 errors.</p> <p>Version 1 summary errors increment whenever a switch in VTP V2 mode receives a VTP Version 1 frame. These errors mean that at least one neighboring switch is either running VTP Version 1 or VTP Version 2 with V2-mode disabled. To solve this problem, change the configuration of the switches in VTP V2-mode to disabled.</p>
Join Transmitted	Number of VTP pruning messages sent on the trunk.
Join Received	Number of VTP pruning messages received on the trunk.
Summary Advts Received from non-pruning-capable device	Number of VTP summary messages received on the trunk from devices that do not support pruning.

This is an example of output from the **show vtp status** command. [Table 2-36](#) describes each field in the display.

```
Switch> show vtp status
VTP Version                : 2
Configuration Revision      : 0
Maximum VLANs supported locally : 1005
Number of existing VLANs    : 45
VTP Operating Mode          : Transparent
VTP Domain Name             : shared_testbed1
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Enabled
MD5 digest                  : 0x3A 0x29 0x86 0x39 0xB4 0x5D 0x58 0xD7
```

**Table 2-36** *show vtp status Field Descriptions*

Field	Description
VTP Version	Displays the VTP version operating on the switch. By default, the switch implements Version 1 but can be set to Version 2.
Configuration Revision	Current configuration revision number on this switch.
Maximum VLANs Supported Locally	Maximum number of VLANs supported locally.
Number of Existing VLANs	Number of existing VLANs.

**Table 2-36** *show vtp status Field Descriptions (continued)*

Field	Description
VTP Operating Mode	<p>Displays the VTP operating mode, which can be server, client, or transparent.</p> <p>Server: a switch in VTP server mode is enabled for VTP and sends advertisements. You can configure VLANs on it. The switch guarantees that it can recover all the VLAN information in the current VTP database from NVRAM after reboot. By default, every switch is a VTP server.</p> <p><b>Note</b> The switch automatically changes from VTP server mode to VTP client mode if it detects a failure while writing the configuration to NVRAM and cannot return to server mode until the NVRAM is functioning.</p> <p>Client: a switch in VTP client mode is enabled for VTP, can send advertisements, but does not have enough nonvolatile storage to store VLAN configurations. You cannot configure VLANs on it. When a VTP client starts up, it does not send VTP advertisements until it receives advertisements to initialize its VLAN database.</p> <p>Transparent: a switch in VTP transparent mode is disabled for VTP, does not send or learn from advertisements sent by other devices, and cannot affect VLAN configurations on other devices in the network. The switch receives VTP advertisements and forwards them on all trunk ports except the one on which the advertisement was received.</p>
VTP Domain Name	Name that identifies the administrative domain for the switch.
VTP Pruning Mode	Displays whether pruning is enabled or disabled. Enabling pruning on a VTP server enables pruning for the entire management domain. Pruning restricts flooded traffic to those trunk links that the traffic must use to access the appropriate network devices.
VTP V2 Mode	Displays if VTP Version 2 mode is enabled. All VTP Version 2 switches operate in Version 1 mode by default. Each VTP switch automatically detects the capabilities of all the other VTP devices. A network of VTP devices should be configured to Version 2 only if all VTP switches in the network can operate in Version 2 mode.
VTP Traps Generation	Displays whether VTP traps are sent to a network management station.
MD5 Digest	A 16-byte checksum of the VTP configuration.
Configuration Last Modified	<p>Displays the date and time of the last configuration modification.</p> <p>Displays the IP address of the switch that caused the configuration change to the database.</p>

Related Commands	Command	Description
	<a href="#">clear vtp counters</a>	Clears the VTP and pruning counters.
	<a href="#">vtp (global configuration)</a>	Configures the VTP filename, interface name, domain name, and mode.
	<a href="#">vtp (VLAN configuration)</a>	Configures the VTP domain name, password, pruning, and mode.

 show vtp