# 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*]

## Syntax Description

| | |
|---|---|
| *index* | Remote Network Monitoring (RMON) collection control index. The range is 1 to 65535. |
| **owner** *name* | (Optional) Owner of the RMON collection. |

## Defaults

The RMON statistics collection is disabled.

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| 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.

## Related Commands

| Command | Description |
|---|---|
| **show rmon statistics** | Displays RMON statistics.<br>For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 > System Management Commands > RMON Commands.** |

# 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 interrupt the boot 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 boot process is allowed only if the user agrees to set the system back to the default configuration.

**service password-recovery**

**no service password-recovery**

## Syntax Description

This command has no arguments or keywords.

## Defaults

The password-recovery mechanism is enabled.

## Command Modes

Global configuration

## Command History

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

## Usage Guidelines

As a system administrator, you can use the **no service password-recovery** 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.

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 boot 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 boot loader 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 boot 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 |
|---|---|
| **show version** | 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 t
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 g3/0/1 - g3/0/2
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)#exit
Switch(config-pmap)#class-map cm-4
Switch(config-pmap-c)#trust dscp
Switch(config-pmap)#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 |
|---|---|
| **policy-map** | Creates or modifies a policy map that can be attached to multiple ports to specify a service policy. |
| **show policy-map** | Displays QoS policy maps. |
| **show running-config** | Displays the running configuration on the switch. For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 > File Management Commands > Configuration File Management Commands**. |

# 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

| | |
|---|---|
| **dscp** *new-dscp* | 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. |
| [**ip**] **precedence** *new-precedence* | 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 |
|---|---|
| **class** | Defines a traffic classification match criteria (through the **police**, **set**, and **trust** policy-map class configuration commands) for the specified class-map name. |
| **police** | Defines a policer for classified traffic. |
| **policy-map** | Creates or modifies a policy map that can be attached to multiple ports to specify a service policy. |
| **show policy-map** | Displays QoS policy maps. |
| **trust** | Defines a trust state for traffic classified through the **class** policy-map configuration command or the **class-map** 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$0Xc1wyT.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 **Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 > File Management Commands > Configuration File Management Commands**. |
| **show version** | 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

| | |
|---|---|
| *name* | (Optional) Name of the ACL. |
| *number* | (Optional) ACL number. The range is 1 to 2699. |
| **hardware counters** | (Optional) Display global hardware ACL statistics for switched and routed packets. |
| ipc | (Optional) Display Interprocess Communication (IPC) protocol access-list configuration download information. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *expression* | 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

## Command History

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

## Usage Guidelines

The switch supports only IP standard and extended access lists. Therefore, the allowed numbers are only 1 to 199 and 1300 to 2699.

This command also displays the MAC ACLs that are configured.

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 access-lists** 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 |
|---|---|
| **access-list** | Configures a standard or extended numbered access list on the switch. For syntax information, select **Cisco IOS IP Command Reference, Volume 1 of 3:Addressing and Services, Release 12.2 > IP Services Commands.** |
| **ip access list** | Configures a named IP access list on the switch. For syntax information, select **Cisco IOS IP Command Reference, Volume 1 of 3:Addressing and Services, Release 12.2 > IP Services Commands.** |
| **mac access-list extended** | 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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 |
|---|---|
| **archive download-sw** | Downloads a new image from a TFTP server to the switch. |

# 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*]]

## Syntax Description

| | |
|---|---|
| **interface** [*interface-id*] | (Optional) Display auto-QoS information for the specified port or for all ports. Valid interfaces include physical ports. |

## Command Modes

User EXEC

## Command History

| Release | Modification |
|---|---|
| 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
```

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 fastethernet0/2
FastEthernet0/2
auto qos voip cisco-phone
```

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 |
|---|---|
| **auto qos voip** | Automatically configures QoS for VoIP within a QoS domain. |
| **debug auto qos** | 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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 **| 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 boot** command. Table 2-15 describes each field in the display.

```
Switch# show boot
BOOT path-list: flash:cbs30x0-lanbase-mz-122.25.SEE/cbs30x0-lanbase-mz-122.25.SEE.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 2-15 show boot Field Descriptions*

| Field | Description |
|---|---|
| BOOT path-list | Displays a semicolon separated list of executable files to try to load and execute when automatically booting.<br><br>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.<br><br>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. |
| 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 is enabled or disabled. If it is set to yes, on, or 1, you can interrupt the automatic boot 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. If it is set to no or 0, the boot loader attempts to automatically boot the system. If it is set to anything else, you must manually boot the switch from the boot loader mode. |
| Helper path-list | Displays a semicolon separated list of loadable files to dynamically load during the boot loader initialization. Helper files extend or patch the functionality of the boot loader. |
| 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 |
|---|---|
| **boot config-file** | Specifies the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration. |
| **boot enable-break** | Enables interrupting the automatic boot process. |
| **boot manual** | Enables manually booting the switch during the next boot cycle. |
| **boot private-config-file** | Specifies the filename that Cisco IOS uses to read and write a nonvolatile copy of the private configuration. |
| **boot system** | Specifies the Cisco IOS image to load during the next boot cycle. |

# 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

| | |
|---|---|
| *class-map-name* | (Optional) Display the contents of the specified class map. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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* are not displayed, but the lines that contain *Output* 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

| Command | Description |
|---|---|
| **class-map** | Creates a class map to be used for matching packets to the class whose name you specify. |
| **match (class-map configuration)** | 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*]

## Syntax Description

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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
```

```
 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 |
|---|---|
| **show controllers ethernet-controller** | Displays per-interface send and receive statistics read from the hardware or the interface internal registers. |
| **show interfaces** | 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

| | |
|---|---|
| *interface-id* | The physical interface (including type, module, and port number). |
| **phy** | (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. |
| **detail** | (Optional) Display details about the PHY internal registers. |
| **port-asic** | (Optional) Display information about the port ASIC internal registers. |
| **configuration** | Display port ASIC internal register configuration. |
| **statistics** | Display port ASIC statistics, including the Rx/Sup Queue and miscellaneous statistics. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *expression* | 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 2-16 describes the *Transmit* fields, and Table 2-17 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 2-16 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 2-16 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[1] 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 2-17 Receive Field Descriptions*

| Field | Description |
|---|---|
| Bytes | The total amount of memory (in bytes) used by frames received on an interface, including the FCS[1] 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 2-17 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[2] 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 2-17 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 Registe          :  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
```

```
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 11 Drop Frames
          0 Sup Queue 4 Drop Frames                0 Sup Queue 12 Drop Frames
          0 Sup Queue 5 Drop Frames                0 Sup Queue 13 Drop Frames
          0 Sup Queue 6 Drop Frames                0 Sup Queue 14 Drop Frames
          0 Sup Queue 7 Drop Frames                0 Sup Queue 15 Drop Frames
=====================================================================
 Switch 1, PortASIC 1 Statistics
---------------------------------------------------------------------
          0 RxQ-0, wt-0 enqueue frames             0 RxQ-0, wt-0 drop frames
         52 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

<output truncated>
```

## Related Commands

| Command | Description |
|---|---|
| **show controllers cpu-interface** | Displays the state of the CPU network ASIC and send and receive statistics for packets reaching the CPU. |
| **show controllers tcam** | Displays the state of registers for all ternary content addressable memory (TCAM) in the system and for TCAM interface ASICs that are CAM controllers. |

# 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

| | |
|---|---|
| **asic** | (Optional) Display port ASIC TCAM information. |
| **number** | (Optional) Display information for the specified port ASIC number. The range is from 0 to 15. |
| **detail** | (Optional) Display detailed TCAM register information. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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 |
|---|---|
| **show controllers cpu-interface** | Displays the state of the CPU network ASIC and send and receive statistics for packets reaching the CPU. |
| **show controllers ethernet-controller** | 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

| | |
|---|---|
| *interface-id* | (Optional) ID of the switch interface. |
| **\| begin** | (Optional) Display begins with the line that matches the specified *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the specified *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 2-18 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 |
|---|---|
| **show controllers ethernet-controller** | Displays the interface internal registers. |

# 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

| | |
|---|---|
| **all** [**summary**] | (Optional) Display the IEEE 802.1x status for all ports. |
| **interface** *interface-id* | (Optional) Display the IEEE 802.1x status for the specified port (including type, module, and port number). |
| **details** | (Optional) Display the IEEE 802.1x interface details. |
| **statistics** | (Optional) Display IEEE 802.1x statistics for the specified port. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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** commmand 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 2-19 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 2-19 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. |
| RxInvalid | Number of EAPOL frames that have been received and have an unrecognized frame type. |

*Table 2-19 show dot1x statistics Field Descriptions (continued)*

| Field | Description |
|---|---|
| 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. |
| LastRxSrcMac | Source MAC address carried in the most recently received EAPOL frame. |

## Related Commands

| Command | Description |
|---|---|
| **dot1x default** | 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

| | |
|---|---|
| **interface** *interface-id* | (Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, module, and port number). |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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* 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

  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 |
|---|---|
| **show interfaces trunk** | 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

| | |
|---|---|
| **registrations** | Display EAP registration information. |
| **method** *name* | (Optional) Display EAP method registration information. |
| **transport** *name* | (Optional) Display EAP transport registration information. |
| **sessions** | Display EAP session information. |
| **credentials** *name* | (Optional) Display EAP method registration information. |
| **interface** *interface-id* | (Optional) Display the EAP information for the specified port (including type, module, and port number). |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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-AuthenticaInterface:              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-AuthenticaInterface:              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-AuthenticaInterface:              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 |
|---|---|
| **clear eap** | Clears EAP session information for the switch or for the specified 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 *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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*]

## Syntax Description

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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.

## Examples

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

```
Switch> show errdisable detect
ErrDisable Reason    Detection status
-----------------    ----------------
udld                 Enabled
bpduguard            Enabled
security-violatio    Enabled
channel-misconfig    Enabled
psecure-violation    Enabled
vmps                 Enabled
loopback             Enabled
pagp-flap            Enabled
dtp-flap             Enabled
link-flap            Enabled
gbic-invalid         Enabled
dhcp-rate-limit      Enabled
unicast-flood        Enabled
storm-control        Enabled
ilpower              Enabled
```

**Note** Though visible in the output, the ilpower, storm-control, and unicast-flood fields are not valid.

**Related Commands**

| Command | Description |
|---|---|
| **errdisable detect cause** | Enables error-disabled detection for a specific cause or all causes. |
| **show errdisable flap-values** | Displays error condition recognition information. |
| **show errdisable recovery** | Displays error-disabled recovery timer information. |
| **show interfaces status** | 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*]

## Syntax Description

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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
```

**Related Commands**

| Command | Description |
|---|---|
| **errdisable detect cause** | Enables error-disabled detection for a specific cause or all causes. |
| **show errdisable detect** | Displays error-disabled detection status. |
| **show errdisable recovery** | Displays error-disabled recovery timer information. |
| **show interfaces status** | 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*]

## Syntax Description

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

A *gbic-invalid error-disable* reason refers to an invalid small form-factor pluggable (SFP) module interface.

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 recovery** 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
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:

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 |
|---|---|
| **errdisable recovery** | Configures the recover mechanism variables. |
| **show errdisable detect** | Displays error-disabled detection status. |
| **show errdisable flap-values** | Displays error condition recognition information. |
| **show interfaces status** | 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

| | |
|---|---|
| *channel-group*-number | (Optional) Number of the channel group. The range is 1 to 48. |
| **detail** | Display detailed EtherChannel information. |
| **load-balance** | Display the load-balance or frame-distribution scheme among ports in the port channel. |
| **port** | Display EtherChannel port information. |
| **port-channel** | Display port-channel information. |
| **protocol** | Display the protocol that is being used in the EtherChannel. |
| **summary** | Display a one-line summary per channel-group. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 you do not specify a *channel-group*, all channel groups are displayed.

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 etherchannel 1 detail** 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
------------

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:
                            LACP port     Admin     Oper    Port     Port
Port      Flags   State     Priority      Key       Key     Number   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

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)
```

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

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

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

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

Group: 2
----------
Protocol:  PAgP
```

## Related Commands

| Command | Description |
|---|---|
| **channel-group** | Assigns an Ethernet port to an EtherChannel group. |
| **channel-protocol** | Restricts the protocol used on a port to manage channeling. |
| **interface port-channel** | Accesses or creates the port channel. |

# 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

| | |
|---|---|
| **interface** *interface-id* | (Optional) Display the flow control status and statistics for a specific interface. |
| **module** *number* | (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. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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
```

## Related Commands

| Command | Description |
|---|---|
| **flowcontrol** | Sets the receive flow-control state for an interface. |

# 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** | **pruning** | **stats** | **status** [**err-disabled**] | **switchport** [**backup** | **module** *number*] | **transceiver** [**properties** | **detail**] [**module** *number*] | **trunk**] [ | {**begin** | **exclude** | **include**} *expression*]

## Syntax Description

| | |
|---|---|
| *interface-id* | (Optional) Valid interfaces include physical ports (including type, module, and port number) and port channels. The port-channel range is 1 to 48. |
| **vlan** *vlan-id* | (Optional) VLAN identification. The range is 1 to 4094. |
| **accounting** | (Optional) Display accounting information on the interface, including active protocols and input and output packets and octets.<br>**Note** The display shows only packets processed in software; hardware-switched packets do not appear. |
| **capabilities** | (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. |
| **module** *number* | (Optional) Display **capabilities**, **switchport** configuration, or **transceiver** 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. |
| **counters** | (Optional) See the **show interfaces counters** command. |
| **description** | (Optional) Display the administrative status and description set for an interface. |
| **etherchannel** | (Optional) Display interface EtherChannel information. |
| **flowcontrol** | (Optional) Display interface flowcontrol information |
| **pruning** | (Optional) Display interface trunk VTP pruning information. |
| **stats** | (Optional) Display the input and output packets by switching path for the interface. |
| **status** | (Optional) Display the status of the interface. A status of *unsupported* in the Type field means that a non-Cisco small form-factor pluggable (SFP) module is inserted in the module slot. |
| **err-disabled** | (Optional) Display interfaces in error-disabled state. |
| **switchport** | (Optional) Display the administrative and operational status of a switching port, including port blocking and port protection settings. |
| **backup** | (Optional) Display Flex Link backup interface configuration and status for the specified interface or all interfaces on the switch. |
| **transceiver** [**detail** \| **properties**] | (Optional) Display the physical properties of a CWDM[1] or DWDM[2] small form-factor (SFP) module interface. The keywords have these meanings:<br>• **detail**—(Optional) Display calibration properties, including high and low numbers and any alarm information.<br>• **properties**—(Optional) Display speed and duplex settings on an interface |

| | |
|---|---|
| **trunk** | Display interface trunk information. If you do not specify an interface, only information for active trunking ports appears. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *expression* | Expression in the output to use as a reference point. |

1. coarse wavelength-division multiplexer
2. dense wavelength-division multiplexer

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

## Command Modes

Privileged EXEC

## Command History

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

## 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 1** 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 gigibitethernet0/2 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 2-20 describes the fields in the display.

**Note** Private VLANs 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
```

*Table 2-20 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<br>Operational Mode | Displays the administrative and operational modes. |
| Administrative Trunking Encapsulation<br>Operational Trunking Encapsulation<br>Negotiation of Trunking | Displays the administrative and operational encapsulation method and whether trunking negotiation is enabled. |
| Access Mode VLAN | Displays the VLAN ID to which the port is configured. |
| Trunking Native Mode VLAN<br>Trunking VLANs Enabled<br>Trunking VLANs Active | 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. |
| 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<br>Unknown multicast blocked | Displays whether or not unknown multicast and unknown unicast traffic is blocked on the interface. |
| Voice VLAN | Displays the VLAN ID on which voice VLAN is enabled. |
| 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
     ------------------------------------------------------------
     Fa0/1               Fa0/2               Active Up/Backup Standby
     Fa0/3               Fa0/5               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 gigibitethernet0/2 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
```

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

```
Switch# show interfaces gigabitethernet0/1 transceiver properties
Name : Gi0/1
Administrative Speed: auto
Operational Speed: auto
Administrative Duplex: auto
Administrative Power Inline: N/A
Operational Duplex: auto
Administrative Auto-MDIX: off
Operational Auto-MDIX: off
```

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

```
Switch# show interfaces gigabitethernet0/3 transceiver detail
ITU Channel not available (Wavelength not available),
Transceiver is externally calibrated.
mA:milliamperes, dBm:decibels (milliwatts), N/A:not applicable.
++:high alarm, +:high warning, -:low warning, -- :low alarm.
A2D readouts (if they differ), are reported in parentheses.
The threshold values are uncalibrated.

                           High Alarm  High Warn  Low Warn   Low Alarm
        Temperature        Threshold   Threshold  Threshold  Threshold
Port     (Celsius)         (Celsius)   (Celsius)  (Celsius)  (Celsius)
------- ------------------ ----------  ---------  ---------  ---------
Gi0/3   41.5               110.0       103.0      -8.0       -12.0

                           High Alarm  High Warn  Low Warn   Low Alarm
         Voltage           Threshold   Threshold  Threshold  Threshold
Port     (Volts)           (Volts)     (Volts)    (Volts)    (Volts)
-------  ---------------   ----------  ---------  ---------  ---------
Gi0/3    3.20              4.00        3.70       3.00       2.95

                           High Alarm  High Warn  Low Warn   Low Alarm
         Current           Threshold   Threshold  Threshold  Threshold
Port     (milliamperes)    (mA)        (mA)       (mA)       (mA)
-------  ----------------  ----------  ---------  ---------  ---------
Gi0/3    31.0              84.0        70.0       4.0        2.0

         Optical           High Alarm  High Warn  Low Warn   Low Alarm
         Transmit Power    Threshold   Threshold  Threshold  Threshold
Port     (dBm)             (dBm)       (dBm)      (dBm)      (dBm)
-------  ----------------  ----------  ---------  ---------  ---------
Gi0/3    -0.0 ( -0.0)      -0.0        -0.0       -0.0       -0.0

         Optical           High Alarm  High Warn  Low Warn   Low Alarm
         Receive Power     Threshold   Threshold  Threshold  Threshold
```

```
Port      (dBm)              (dBm)        (dBm)       (dBm)       (dBm)
--------  -----------------  -----------  ----------  ----------  ----------
Gi0/3     N/A  ( -0.0) --    -0.0         -0.0        -0.0        -0.0
```

## Related Commands

| Command | Description |
|---|---|
| **switchport access** | Configures a port as a static-access or a dynamic-access port. |
| **switchport block** | Blocks unknown unicast or multicast traffic on an interface. |
| **switchport backup interface** | Configures Flex Links, a pair of Layer 2 interfaces that provide mutual backup. |
| **switchport mode** | Configures the VLAN membership mode of a port. |
| **switchport protected** | Isolates unicast, multicast, and broadcast traffic at Layer 2 from other protected ports on the same switch. |
| **switchport trunk pruning** | 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

| | |
|---|---|
| *interface-id* | (Optional) ID of the physical interface, including type, module, and port number. |
| **errors** | (Optional) Display error counters. |
| **etherchannel** | (Optional) Display EtherChannel counters, including octets, broadcast packets, multicast packets, and unicast packets received and sent. |
| **protocol status** | (Optional) Display status of protocols enabled on interfaces. |
| **trunk** | (Optional) Display trunk counters. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *expression* | 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
```

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>
```

## Related Commands

| Command | Description |
|---|---|
| **show interfaces** | 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

| | |
|---|---|
| *entity-name* | (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. |
| **raw** | (Optional) Display every entity in the device. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 ip dhcp snooping** 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
```

## Related Commands

| Command | Description |
|---|---|
| **show ip dhcp snooping binding** | 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*]

## Syntax Description

| | |
|---|---|
| *ip-address* | (Optional) Specify the binding entry IP address. |
| *mac-address* | (Optional) Specify the binding entry MAC address. |
| **interface** *interface-id* | (Optional) Specify the binding input interface. |
| **vlan** *vlan-id* | (Optional) Specify the binding entry VLAN. |
| **\| begin** | Display begins with the line that matches the *expression*. |
| **\| exclude** | Display excludes lines that match the *expression*. |
| **\| include** | Display includes lines that match the specified *expression*. |
| *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

The **show ip dhcp snooping binding** command output shows the dynamically configured bindings.

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
```

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 2-21 describes the fields in the **show ip dhcp snooping binding** command output:

***Table 2-21 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<br>**Note** 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 |
|---|---|
| **show ip dhcp snooping** | Displays the DHCP snooping configuration. |

# 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

| | |
|---|---|
| *profile number* | (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. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 **| 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

| Command | Description |
|---|---|
| **ip igmp profile** | 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

| | |
|---|---|
| **groups** | (Optional) See the **show ip igmp snooping groups** command. |
| **mrouter** | (Optional) See the **show ip igmp snooping mrouter** command. |
| **querier** | (Optional) See the **show ip igmp snooping querier** command. |
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094 (available only in privileged EXEC mode). |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

Use this command to display snooping configuration for 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.

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 vlan 1** command. It shows snooping characteristics for a specific VLAN.

```
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

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
```

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
```

## Related Commands

| Command | Description |
|---|---|
| **ip igmp snooping** | Enables IGMP snooping on the switch or on a VLAN. |
| **ip igmp snooping last-member-query-interval** | Enables the IGMP snooping configurable-leave timer. |
| **ip igmp snooping querier** | Enables the IGMP querier function in Layer 2 networks. |
| **ip igmp snooping report-suppression** | Enables IGMP report suppression. |
| **ip igmp snooping tcn** | Configures the IGMP topology change notification behavior. |
| **ip igmp snooping tcn flood** | Specifies multicast flooding as the IGMP spanning-tree topology change notification behavior. |
| **ip igmp snooping vlan immediate-leave** | Enables IGMP snooping immediate-leave processing on a VLAN. |
| **ip igmp snooping vlan mrouter** | Adds a multicast router port or configures the multicast learning method. |
| **ip igmp snooping vlan static** | Statically adds a Layer 2 port as a member of a multicast group. |
| **show ip igmp snooping groups** | Displays the IGMP snooping multicast table for the switch. |

| Command | Description |
|---|---|
| **show ip igmp snooping mrouter** | Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN. |
| **show ip igmp snooping querier** | 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

| | |
|---|---|
| **count** | (Optional) Display the total number of entries for the specified command options instead of the actual entries. |
| **dynamic** | (Optional) Display entries learned by IGMP snooping. |
| **user** | Optional) Display only the user-configured multicast entries. |
| *ip_address* | (Optional) Display characteristics of the multicast group with the specified group IP address. |
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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          Gi0/19, Gi0/20
120       232.5.9.30      igmp        v3          Gi0/19, Gi0/20
```

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          Gi0/1, Gi0/2
104       224.1.4.3       igmp        v2          Gi0/1, Gi0/2
```

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
```

## Related Commands

| Command | Description |
|---|---|
| **ip igmp snooping** | Enables IGMP snooping on the switch or on a VLAN. |
| **ip igmp snooping vlan mrouter** | Configures a multicast router port. |
| **ip igmp snooping vlan static** | Statically adds a Layer 2 port as a member of a multicast group. |
| **show ip igmp snooping** | Displays the IGMP snooping configuration of the switch or the VLAN. |
| **show ip igmp snooping mrouter** | 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

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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 |
|---|---|
| **ip igmp snooping** | Enables IGMP snooping on the switch or on a VLAN. |
| **ip igmp snooping vlan mrouter** | Adds a multicast router port. |
| **ip igmp snooping vlan static** | Statically adds a Layer 2 port as a member of a multicast group. |
| **show ip igmp snooping** | Displays the IGMP snooping configuration of the switch or the VLAN |
| **show ip igmp snooping groups** | 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

| | |
|---|---|
| **detail** | Optional) Display detailed IGMP querier information. |
| **vlan** *vlan-id* [**detail**] | Optional) Display IGMP querier information for the specified VLAN. The range is 1 to 1001 and 1006 to 4094. Use the **detail** keyword to display detailed information. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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                  Gi0/20
129       172.20.129.1    v2                  Gi0/24
```

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 Fa0/1
-----------------------------------------------------------
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 |
|---|---|
| **ip igmp snooping** | Enables IGMP snooping on the switch or on a VLAN. |
| **ip igmp snooping querier** | Enables the IGMP querier function in Layer 2 networks. |
| **show ip igmp snooping** | Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN. |

# 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

| | |
|---|---|
| *channel-group-number* | (Optional) Number of the channel group. The range is 1 to 48. |
| **counters** | Display traffic information. |
| **internal** | Display internal information. |
| **neighbor** | Display neighbor information. |
| **sys-id** | 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. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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. Table 2-22 describes the fields in the display.

```
Switch> show lacp counters
               LACPDUs          Marker      Marker Response    LACPDUs
Port          Sent    Recv     Sent    Recv     Sent    Recv      Pkts Err
--------------------------------------------------------------------------
Channel group:1
Gi0/1         19      10       0       0        0       0         0
Gi0/2         14      6        0       0        0       0         0
```

*Table 2-22 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
                            LACP port     Admin     Oper    Port     Port
Port        Flags   State   Priority      Key       Key     Number   State
Gi0/1       SA      bndl    32768         0x3       0x3     0x4      0x3D
Gi0/2       SA      bndl    32768         0x3       0x3     0x5      0x3D
```

Table 2-23 describes the fields in the display:

***Table 2-23 show lacp internal Field Descriptions***

| Field | Description |
|---|---|
| State | State of the specific port. These are the allowed values:<br>• – —Port is in an unknown state.<br>• **bndl**—Port is attached to an aggregator and bundled with other ports.<br>• **susp**—Port is in a suspended state; it is not attached to any aggregator.<br>• **hot-sby**—Port is in a hot-standby state.<br>• **indiv**—Port is incapable of bundling with any other port.<br>• **indep**—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).<br>• **down**—Port is down. |
| LACP Port Priority | Port priority setting. LACP uses the port priority to put ports s in standby mode when there is a hardware limitation that prevents all compatible ports from aggregating. |
| 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 | State variables for the port, encoded as individual bits within a single octet with these meanings:<br>• bit0: LACP_Activity<br>• bit1: LACP_Timeout<br>• bit2: Aggregation<br>• bit3: Synchronization<br>• bit4: Collecting<br>• bit5: Distributing<br>• bit6: Defaulted<br>• bit7: Expired<br>**Note** In the list above, bit7 is the MSB and bit0 is the LSB. |

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:

          Partner               Partner                     Partner
Port      System ID             Port Number     Age         Flags
Gi0/1     32768,0007.eb49.5e80  0xC               19s       SP

          LACP Partner          Partner         Partner
          Port Priority         Oper Key        Port State
          32768                 0x3             0x3C

Partner's information:

          Partner               Partner                     Partner
Port      System ID             Port Number     Age         Flags
Gi0/2     32768,0007.eb49.5e80  0xD               15s       SP

          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 |
|---|---|
| **clear lacp** | Clears the LACP channel-group information. |
| **lacp port-priority** | Configures the LACP port priority. |
| **lacp system-priority** | Configures the LACP system priority. |

# 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

| | |
|---|---|
| *number* | (Optional) Number of the link-state group. |
| **detail** | (Optional) Specify that detailed information appears. |

## Defaults

There is no default.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 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.

## 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 |
|---|---|
| **link state group** | Configures an interface as a member of a link-state group. |
| **link state track** | Enables a link-state group. |
| **show running-config** | Displays the current operating configuration. For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference for Release 12.2 > Cisco IOS File Management Commands > Configuration File Commands**. |

# 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

| | |
|---|---|
| **interface** *interface-id* | (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 48 (available only in privileged EXEC mode). |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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-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 |
|---|---|
| **mac access-group** | 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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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** command:

```
Switch> show mac address-table
          Mac Address Table
-------------------------------------------
Vlan    Mac Address       Type       Ports
----    -----------       ----       -----
 All    0000.0000.0001    STATIC     CPU
 All    0000.0000.0002    STATIC     CPU
 All    0000.0000.0003    STATIC     CPU
 All    0000.0000.0009    STATIC     CPU
 All    0000.0000.0012    STATIC     CPU
 All    0180.c200.000b    STATIC     CPU
 All    0180.c200.000c    STATIC     CPU
 All    0180.c200.000d    STATIC     CPU
 All    0180.c200.000e    STATIC     CPU
 All    0180.c200.000f    STATIC     CPU
 All    0180.c200.0010    STATIC     CPU
   1    0030.9441.6327    DYNAMIC    Gi0/4
Total Mac Addresses for this criterion: 12
```

## Related Commands

| Command | Description |
|---|---|
| **clear mac address-table dynamic** | 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. |
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table notification** | Displays the MAC address notification settings for all interfaces or the specified interface. |
| **show mac address-table static** | Displays static MAC address table entries only. |
| **show mac address-table vlan** | 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 *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 |
|---|---|
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table notification** | Displays the MAC address notification settings for all interfaces or the specified interface. |
| **show mac address-table static** | Displays static MAC address table entries only. |
| **show mac address-table vlan** | 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 *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 |
|---|---|
| **mac address-table aging-time** | Sets the length of time that a dynamic entry remains in the MAC address table after the entry is used or updated. |
| **show mac address-table address** | Displays MAC address table information for the specified MAC address. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table notification** | Displays the MAC address notification settings for all interfaces or the specified interface. |
| **show mac address-table static** | Displays static MAC address table entries only. |
| **show mac address-table vlan** | 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 *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 |
|---|---|
| **show mac address-table address** | Displays MAC address table information for the specified MAC address. |
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table notification** | Displays the MAC address notification settings for all interfaces or the specified interface. |
| **show mac address-table static** | Displays static MAC address table entries only. |
| **show mac address-table vlan** | 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

| | |
|---|---|
| **address** *mac-address* | (Optional) Specify a 48-bit MAC address; the valid format is H.H.H (available in privileged EXEC mode only). |
| **interface** *interface-id* | (Optional) Specify an interface to match; valid *interfaces* include physical ports and port channels. |
| **vlan** *vlan-id* | (Optional) Display entries for a specific VLAN; the range is 1 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 |
|---|---|
| **clear mac address-table dynamic** | 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. |
| **show mac address-table address** | Displays MAC address table information for the specified MAC address. |
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table static** | Displays static MAC address table entries only. |
| **show mac address-table vlan** | 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

| | |
|---|---|
| *interface-id* | Specify an interface type; valid interfaces include physical ports and port channels. |
| **vlan** *vlan-id* | (Optional) Display entries for a specific VLAN; the range is 1 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 |
|---|---|
| **show mac address-table address** | Displays MAC address table information for the specified MAC address. |
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table notification** | Displays the MAC address notification settings for all interfaces or the specified interface. |
| **show mac address-table static** | Displays static MAC address table entries only. |
| **show mac address-table vlan** | Displays the MAC address table information for the specified 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**]

## Syntax Description

| | |
|---|---|
| \| **begin** | (Optional) Display begins with the line that matches the expression. |
| \| **exclude** | (Optional) Display excludes lines that match the expression. |
| \| **include** | (Optional) Display includes lines that match the specified expression. |
| *expression* | Expression in the output to use as a reference point. |

## Command Modes

User EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(25)SED | This command was introduced. |
| 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 move update** 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#
```

**Related Commands**

| Command | Description |
|---|---|
| **clear mac address-table move update** | Clears the MAC address-table move update counters. |
| **mac address-table move update** {**receive** \| **transmit**} | 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

| | |
|---|---|
| **interface** | (Optional) Display information for all interfaces. Valid interfaces include physical ports and port channels. |
| *interface-id* | (Optional) Display information for the specified interface. Valid interfaces include physical ports and port channels. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

Use the **show mac address-table notification** 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.

Use the **interface** keyword to display the flags for all interfaces. If the *interface-id* is included, only the flags for that interface 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 mac address-table notification** 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 :
```

```
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 |
|---|---|
| **clear mac address-table notification** | Clears the MAC address notification global counters. |
| **show mac address-table address** | Displays MAC address table information for the specified MAC address. |
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table static** | Displays static MAC address table entries only. |
| **show mac address-table vlan** | 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

| | |
|---|---|
| **address** *mac-address* | (Optional) Specify a 48-bit MAC address; the valid format is H.H.H (available in privileged EXEC mode only). |
| **interface** *interface-id* | (Optional) Specify an interface to match; valid *interfaces* include physical ports and port channels. |
| **vlan** *vlan-id* | (Optional) Display addresses for a specific VLAN. The range is 1 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 static** 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 |
|---|---|
| **mac address-table static** | Adds static addresses to the MAC address table. |
| **mac address-table static drop** | Enables unicast MAC address filtering and configures the switch to drop traffic with a specific source or destination MAC address. |
| **show mac address-table address** | Displays MAC address table information for the specified MAC address. |
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table notification** | Displays the MAC address notification settings for all interfaces or the specified interface. |
| **show mac address-table vlan** | 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

| | |
|---|---|
| *vlan-id* | (Optional) Display addresses for a specific VLAN. The range is 1 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 |
|---|---|
| **show mac address-table address** | Displays MAC address table information for the specified MAC address. |
| **show mac address-table aging-time** | Displays the aging time in all VLANs or the specified VLAN. |
| **show mac address-table count** | Displays the number of addresses present in all VLANs or the specified VLAN. |
| **show mac address-table dynamic** | Displays dynamic MAC address table entries only. |
| **show mac address-table interface** | Displays the MAC address table information for the specified interface. |
| **show mac address-table notification** | Displays the MAC address notification settings for all interfaces or the specified interface. |
| **show mac address-table static** | 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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 mls qos** 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
```

## Related Commands

| Command | Description |
|---|---|
| **mls qos** | 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

| | |
|---|---|
| *aggregate-policer-name* | (Optional) Display the policer configuration for the specified name. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 |
|---|---|
| **mls qos aggregate-policer** | 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*]

## Syntax Description

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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
```

## Related Commands

| Command | Description |
|---|---|
| **mls qos srr-queue input bandwidth** | Assigns shaped round robin (SRR) weights to an ingress queue. |
| **mls qos srr-queue input buffers** | Allocates the buffers between the ingress queues. |
| **mls qos srr-queue input cos-map** | Maps assigned class of service (CoS) values to an ingress queue and assigns CoS values to a queue and to a threshold ID. |
| **mls qos srr-queue input dscp-map** | Maps assigned Differentiated Services Code Point (DSCP) values to an ingress queue and assigns DSCP values to a queue and to a threshold ID. |
| **mls qos srr-queue input priority-queue** | Configures the ingress priority queue and guarantees bandwidth. |
| **mls qos srr-queue input threshold** | 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

| | |
|---|---|
| *interface-id* | (Optional) Display QoS information for the specified port. Valid interfaces include physical ports. |
| **buffers** | (Optional) Display the buffer allocation among the queues. |
| **queueing** | (Optional) Display the queueing strategy (shared or shaped) and the weights corresponding to the queues. |
| **statistics** | (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. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *expression* | 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

## 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 interface** *interface-id* 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 2-24 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
```

```
  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
  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 2-24 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 |
|---|---|
| **mls qos queue-set output buffers** | Allocates buffers to a queue-set. |
| **mls qos queue-set output threshold** | Configures the weighted tail-drop (WTD) thresholds, guarantees the availability of buffers, and configures the maximum memory allocation to a queue-set. |
| **mls qos srr-queue input bandwidth** | Assigns SRR weights to an ingress queue. |
| **mls qos srr-queue input buffers** | Allocates the buffers between the ingress queues. |
| **mls qos srr-queue input cos-map** | Maps CoS values to an ingress queue or maps CoS values to a queue and to a threshold ID. |
| **mls qos srr-queue input dscp-map** | Maps DSCP values to an ingress queue or maps DSCP values to a queue and to a threshold ID. |
| **mls qos srr-queue input priority-queue** | Configures the ingress priority queue and guarantees bandwidth. |

| Command | Description |
|---|---|
| **mls qos srr-queue input threshold** | Assigns WTD threshold percentages to an ingress queue. |
| **mls qos srr-queue output cos-map** | Maps CoS values to an egress queue or maps CoS values to a queue and to a threshold ID. |
| **mls qos srr-queue output dscp-map** | Maps DSCP values to an egress queue or maps DSCP values to a queue and to a threshold ID. |
| **policy-map** | Creates or modifies a policy map. |
| **priority-queue** | Enables the egress expedite queue on a port. |
| **queue-set** | Maps a port to a queue-set. |
| **srr-queue bandwidth limit** | Limits the maximum output on a port. |
| **srr-queue bandwidth shape** | Assigns the shaped weights and enables bandwidth shaping on the four egress queues mapped to a port. |
| **srr-queue bandwidth share** | 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

| | |
|---|---|
| **cos-dscp** | (Optional) Display class of service (CoS)-to-DSCP map. |
| **cos-input-q** | (Optional) Display the CoS input queue threshold map. |
| **cos-output-q** | (Optional) Display the CoS output queue threshold map. |
| **dscp-cos** | (Optional) Display DSCP-to-CoS map. |
| **dscp-input-q** | (Optional) Display the DSCP input queue threshold map. |
| **dscp-mutation** *dscp-mutation-name* | (Optional) Display the specified DSCP-to-DSCP-mutation map. |
| **dscp-output-q** | (Optional) Display the DSCP output queue threshold map. |
| **ip-prec-dscp** | (Optional) Display the IP-precedence-to-DSCP map. |
| **policed-dscp** | (Optional) Display the policed-DSCP map. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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.

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 |
|---|---|
| **mls qos map** | 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. |
| **mls qos srr-queue input cos-map** | Maps CoS values to an ingress queue or maps CoS values to a queue and to a threshold ID. |
| **mls qos srr-queue input dscp-map** | Maps DSCP values to an ingress queue or maps DSCP values to a queue and to a threshold ID. |
| **mls qos srr-queue output cos-map** | Maps CoS values to an egress queue or maps CoS values to a queue and to a threshold ID. |
| **mls qos srr-queue output dscp-map** | 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

| | |
|---|---|
| *qset-id* | (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. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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.nway

## 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 |
|---|---|
| **mls qos queue-set output buffers** | Allocates buffers to the queue-set. |
| **mls qos queue-set output threshold** | 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

| | |
|---|---|
| *vlan-id* | Specify the VLAN ID of the SVI to display the policy maps. The range is 1 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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

| Command | Description |
|---|---|
| **policy-map** | 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

| | |
|---|---|
| **session** | (Optional) Display information about specified SPAN sessions. |
| **session_number** | Specify the number of the SPAN or RSPAN session. The range is 1 to 66. |
| **all** | Display all SPAN sessions. |
| **local** | Display only local SPAN sessions. |
| **range** *list* | Display a range of SPAN sessions, where *list* 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.<br>**Note** This keyword is available only in privileged EXEC mode. |
| **remote** | Display only remote SPAN sessions. |
| **detail** | (Optional) Display detailed information about the specified sessions. |
| **\| begin** | Display begins with the line that matches the *expression*. |
| **\| exclude** | Display excludes lines that match the *expression*. |
| **\| include** | Display includes lines that match the specified *expression*. |
| *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.

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 : Gi0/1
Both : Gi0/2-3,Gi0/5-6
Destination Ports : Gi0/20
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 : Gi0/1
Both : Gi0/2-3,Gi0/5-6
Destination Ports : Gi0/20
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 : Gi0/2
Destination Ports : Gi0/3
Encapsulation : Native
Ingress : Enabled, default VLAN = 5
Ingress encap : DOT1Q

Session 2
---------
Type : Local Session
Source Ports :
Both : Gi0/8
Destination Ports : Gi0/12
Encapsulation : Replicate
Ingress : Enabled, default VLAN = 4
Ingress encap : Untagged
```

**Related Commands**

| Command | Description |
|---|---|
| **monitor session** | 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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 **| 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** 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 |
|---|---|
| **mvr (global configuration)** | Enables and configures multicast VLAN registration on the switch. |
| **mvr (interface configuration)** | Configures MVR ports. |
| **show mvr interface** | Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the **interface** and **members** keywords are appended to the command. |
| **show mvr members** | 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.<br>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 *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 |
|---|---|
| **mvr (global configuration)** | Enables and configures multicast VLAN registration on the switch. |
| **mvr (interface configuration)** | Configures MVR ports. |
| **show mvr** | Displays the global MVR configuration on the switch. |
| **show mvr members** | 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 *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 |
|---|---|
| **mvr (global configuration)** | Enables and configures multicast VLAN registration on the switch. |
| **mvr (interface configuration)** | Configures MVR ports. |
| **show mvr** | Displays the global MVR configuration on the switch. |
| **show mvr interface** | Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the **members** keyword is appended to the command. |

# show pagp

Use the **show pagp** user EXEC command to display Port Aggregation Protocol (PAgP) channel-group information.

**show pagp** [*channel-group-number*] {**counters** | **internal** | **neighbor**} [ | {**begin** | **exclude** | **include**} *expression*]]

## Syntax Description

| | |
|---|---|
| *channel-group*-number | (Optional) Number of the channel group. The range is 1 to . |
| **counters** | Display traffic information. |
| **internal** | Display internal information. |
| **neighbor** | Display neighbor information. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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
```

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
                                Hello    Partner  PAgP     Learning  Group
Port        Flags State   Timers  Interval Count   Priority   Method  Ifindex
Gi0/1       SC    U6/S7   H       30s      1         128        Any      16
Gi0/2       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
                Partner             Partner          Partner           Partner Group
    Port        Name                Device ID        Port         Age  Flags   Cap.
    Gi0/1       switch-p2           0002.4b29.4600   Gi0/1          9s SC      10001
    Gi0/2       switch-p2           0002.4b29.4600   Gi0/2         24s SC      10001
```

## Related Commands

| Command | Description |
|---|---|
| **clear pagp** | 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

| | |
|---|---|
| **brief** | (Optional) Display the name of each macro. |
| **description** [**interface** *interface-id*] | (Optional) Display all macro descriptions or the description of a specific interface. |
| **name** *macro-name* | (Optional) Display information about a single macro identified by the macro name. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 a partial output example from the **show parser macro** 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 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 description interface** command:

```
Switch# show parser macro description interface gigabitethernet0/2
Interface    Macro Description
-----------------------------------------------------------------
Gi0/2      this is test macro
-----------------------------------------------------------------
```

## Related Commands

| Command | Description |
|---|---|
| **macro apply** | Applies a macro on an interface or applies and traces a macro on an interface. |
| **macro description** | Adds a description about the macros that are applied to an interface. |
| **macro global** | Applies a macro on a switch or applies and traces a macro on a switch. |
| **macro global description** | Adds a description about the macros that are applied to the switch. |
| **macro name** | Creates a macro. |
| **show running-config** | Displays the current operating configuration, including defined macros. For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 > File Management Commands > Configuration File Management Commands**. |

# 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

| | |
|---|---|
| *policy-map-name* | (Optional) Display the specified policy-map name. |
| **class** *class-map-name* | (Optional) Display QoS policy actions for a individual class. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *expression* | 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 100000000 2000000 exceed-action drop

 Policy Map mypolicy
  class  dscp5
   set dscp 6
```

**Related Commands**

| Command | Description |
|---|---|
| **policy-map** | 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

| | |
|---|---|
| **interface** *interface-id* | (Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, module, and port number). |
| **address** | (Optional) Display all secure MAC addresses on all ports or a specified port. |
| **vlan** | (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 **trunk**. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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
```

**Related Commands**

| Command | Description |
|---|---|
| **clear port-security** | Deletes from the MAC address table a specific type of secure address or all the secure addresses on the switch or an interface. |
| **switchport port-security** | 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 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

| | |
|---|---|
| *bridge-group* | (Optional) Specify the bridge group number. The range is 1 to 255. |
| **active** [**detail**] | (Optional) Display spanning-tree information only on active interfaces (available only in privileged EXEC mode). |
| **backbonefast** | (Optional) Display spanning-tree BackboneFast status. |
| **blockedports** | (Optional) Display blocked port information (available only in privileged EXEC mode). |
| **bridge** [**address** \| **detail** \| **forward-time** \| **hello-time** \| **id** \| **max-age** \| **priority** [**system-id**] \| **protocol**] | (Optional) Display status and configuration of this switch (optional keywords available only in privileged EXEC mode). |
| **detail** [**active**] | (Optional) Display a detailed summary of interface information (**active** keyword available only in privileged EXEC mode). |
| **inconsistentports** | (Optional) Display inconsistent port information (available only in privileged EXEC mode). |
| **interface** *interface-id* [**active** [**detail**] \| **cost** \| **detail** [**active**] \| **inconsistency** \| **portfast** \| **priority** \| **rootcost** \| **state**] | (Optional) Display spanning-tree information for the specified interface (all options except **portfast** and **state** 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 48. |

| | |
|---|---|
| **mst** [**configuration** [**digest**]] [*instance-id* [**detail** \| **interface** *interface-id* [**detail**]] | (Optional) Display the multiple spanning-tree (MST) region configuration and status (available only in privileged EXEC mode).<br>The keywords have these meanings:<br>• **digest**—(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).<br>The terminology was updated for the implementation of the IEEE standard, and the *txholdcoun*t field was added.<br>The new master role appears for boundary ports.<br>The word *pre-standard* or *Pre-STD* appears when an IEEE standard bridge sends prestandard BPDUs on a port.<br>The word *pre-standard (config)* or *Pre-STD-Cf* appears when a port has been configured to transmit prestandard BPDUs and no prestandard BPDU has been received on that port.<br>The word *pre-standard (rcvd)* or *Pre-STD-Rx* appears when a prestandard BPDU has been received on a port that has not been configured to transmit prestandard BPDUs.<br>A *dispute* flag appears when a designated port receives inferior designated information until the port returns to the forwarding state or ceases to be designated.<br>• *instance-id*—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.<br>• **interface** *interface-id*—(Optional) Valid interfaces include physical ports, VLANs, and port channels. The VLAN range is 1 to 4094. The port-channel range is 1 to 48.<br>• **detail**—(Optional) Display detailed information for the instance or interface. |
| **pathcost method** | (Optional) Display the default path cost method (available only in privileged EXEC mode). |
| **root** [**address** \| **cost** \| **detail** \| **forward-time** \| **hello-time** \| **id** \| **max-age** \| **port** \| **priority** [**system-id**]] | (Optional) Display root switch status and configuration (all keywords available only in privileged EXEC mode). |
| **summary** [**totals**] | (Optional) Display a summary of port states or the total lines of the spanning-tree state section. The words *IEEE Standard* identify the MST version running on a switch. |
| **uplinkfast** | (Optional) Display spanning-tree UplinkFast status. |
| **vlan** *vlan-id* [**active** [**detail**] \| **backbonefast** \| **blockedports** \| **bridge** [**address** \| **detail** \| **forward-time** \| **hello-time** \| **id** \| **max-age** \| **priority** [**system-id**] \| **protocol**] | (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. |

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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
<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 24 (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
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)
Port-channel1          desg FWD   200000    128  P2P bound(STP)
```

**Related Commands**

| Command | Description |
|---|---|
| clear spanning-tree counters | Clears the spanning-tree counters. |
| clear spanning-tree detected-protocols | Restarts the protocol migration process. |
| spanning-tree backbonefast | Enables the BackboneFast feature. |
| spanning-tree bpdufilter | Prevents an interface from sending or receiving bridge protocol data units (BPDUs). |
| spanning-tree bpduguard | Puts an interface in the error-disabled state when it receives a BPDU. |
| spanning-tree cost | Sets the path cost for spanning-tree calculations. |
| spanning-tree extend system-id | Enables the extended system ID feature. |
| spanning-tree guard | Enables the root guard or the loop guard feature for all the VLANs associated with the selected interface. |
| spanning-tree link-type | Overrides the default link-type setting for rapid spanning-tree transitions to the forwarding state. |
| spanning-tree loopguard default | Prevents alternate or root ports from becoming the designated port because of a failure that leads to a unidirectional link. |
| spanning-tree mst configuration | Enters multiple spanning-tree (MST) configuration mode through which the MST region configuration occurs. |
| spanning-tree mst cost | Sets the path cost for MST calculations. |
| spanning-tree mst forward-time | Sets the forward-delay time for all MST instances. |
| spanning-tree mst hello-time | Sets the interval between hello BPDUs sent by root switch configuration messages. |
| spanning-tree mst max-age | Sets the interval between messages that the spanning tree receives from the root switch. |
| spanning-tree mst max-hops | Sets the number of hops in an MST region before the BPDU is discarded and the information held for an interface is aged. |
| spanning-tree mst port-priority | Configures an interface priority. |
| spanning-tree mst priority | Configures the switch priority for the specified spanning-tree instance. |
| spanning-tree mst root | Configures the MST root switch priority and timers based on the network diameter. |
| spanning-tree port-priority | Configures an interface priority. |
| spanning-tree portfast (global configuration) | 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. |
| spanning-tree portfast (interface configuration) | Enables the Port Fast feature on an interface and all its associated VLANs. |
| spanning-tree uplinkfast | Accelerates the choice of a new root port when a link or switch fails or when the spanning tree reconfigures itself. |
| spanning-tree vlan | 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

| | |
|---|---|
| *interface-id* | (Optional) Interface ID for the physical port (including type, module, and port number). |
| **broadcast** | (Optional) Display broadcast storm threshold setting. |
| **multicast** | (Optional) Display multicast storm threshold setting. |
| **unicast** | (Optional) Display unicast storm threshold setting. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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

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 2-25 describes the fields in the **show storm-control** display.

***Table 2-25 show storm-control Field Descriptions***

| Field | Description |
|---|---|
| Interface | Displays the ID of the interface. |
| Filter State | Displays the status of the filter:<br>• Blocking—Storm control is enabled, and a storm has occurred.<br>• Forwarding—Storm control is enabled, and no storms have occurred.<br>• Inactive—Storm control is disabled. |
| 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 |
|---|---|
| **storm-control** | 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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 Mbps; 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
```

## Related Commands

| Command | Description |
|---|---|
| **system mtu** | Sets the MTU size for the Fast Ethernet, Gigabit Ethernet, or routed ports. |

# show udld

Use the **show udld** user EXEC command to display UniDirectional Link Detection (UDLD) administrative and operational status for all ports or the specified port.

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

## Syntax Description

| | |
|---|---|
| *interface-id* | (Optional) ID of the interface and port number. Valid interfaces include physical ports and VLANs. The VLAN range is 1 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 you do not enter an *interface-id*, administrative and operational UDLD status for all interfaces 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 udld** *interface-id* command. For this display, UDLD is enabled on both ends of the link, and UDLD detects that the link is bidirectional. Table 2-26 describes the fields in this display.

```
Switch> show udld 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 2-26 show udld 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 |
|---|---|
| **udld** | Enables aggressive or normal mode in UDLD or sets the configurable message timer time. |
| **udld port** | Enables UDLD on an individual interface or prevents a fiber-optic interface from being enabled by the **udld** global configuration command. |
| **udld reset** | 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

| | |
|---|---|
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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** | **id** *vlan-id* | **mtu** | **name** *vlan-name* | **remote-span** | **summary**] [ | {**begin** | **exclude** | **include**} *expression*]

## Syntax Description

| | |
|---|---|
| **brief** | (Optional) Display one line for each VLAN with the VLAN name, status, and its ports. |
| **id** *vlan-id* | (Optional) Display information about a single VLAN identified by VLAN ID number. For *vlan-id*, the range is 1 to 4094. |
| **mtu** | (Optional) Display a list of VLANs and the minimum and maximum transmission unit (MTU) sizes configured on ports in the VLAN. |
| **name** *vlan-name* | (Optional) Display information about a single VLAN identified by VLAN name. The VLAN name is an ASCII string from 1 to 32 characters. |
| **remote-span** | (Optional) Display information about Remote SPAN (RSPAN) VLANs. |
| **summary** | (Optional) Display VLAN summary information. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *expression* | Expression in the output to use as a reference point. |

**Note** Though visible in the command-line help string, the **ifindex**, **internal usage**, and **private-vlan** keywords are not supported.

## Command Modes

User EXEC

## Command History

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

## 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.

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 2-27 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
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
VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
```

```
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
VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
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 2-27 show vlan Command Output Fields***

| Field | Description |
|---|---|
| VLAN | VLAN number. |
| Name | Name, if configured, of the VLAN. |
| 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. |

*Table 2-27 show vlan Command Output Fields (continued)*

| Field | Description |
|---|---|
| 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. |

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

```
Switch> show vlan summary
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 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
------- --------- ----------------- ------------------------------------------
```

**Related Commands**

| Command | Description |
|---|---|
| **switchport mode** | Configures the VLAN membership mode of a port. |
| **vlan (global configuration)** | Enables VLAN configuration mode where you can configure VLANs 1 to 4094. |
| **vlan (VLAN configuration)** | 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 *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 **| 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 access-map** command:

```
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
```

## Related Commands

| Command | Description |
|---|---|
| **show vlan filter** | Displays information about all VLAN filters or about a particular VLAN or VLAN access map. |
| **vlan access-map** | Creates a VLAN map entry for VLAN packet filtering. |
| **vlan filter** | 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

| | |
|---|---|
| **access-map** *name* | (Optional) Display filtering information for the specified VLAN access map. |
| **vlan** *vlan-id* | (Optional) Display filtering information for the specified VLAN. The range is 1 to 4094. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 **| 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 |
|---|---|
| **show vlan access-map** | Displays information about a particular VLAN access map or for all VLAN access maps. |
| **vlan access-map** | Creates a VLAN map entry for VLAN packet filtering. |
| **vlan filter** | 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*]

## Syntax Description

| | |
|---|---|
| **statistics** | (Optional) Display VQP client-side statistics and counters. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 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 2-28 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 2-28 show vmps 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. |

**Related Commands**

| Command | Description |
|---|---|
| **clear vmps statistics** | Clears the statistics maintained by the VQP client. |
| **vmps reconfirm (privileged EXEC)** | Sends VQP queries to reconfirm all dynamic VLAN assignments with the VMPS. |
| **vmps retry** | Configures the per-server retry count for the VQP client. |
| **vmps server** | 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

| | |
|---|---|
| **counters** | Display the VTP statistics for the switch. |
| **password** | Display the configured VTP password. |
| **status** | Display general information about the VTP management domain status. |
| **\| begin** | (Optional) Display begins with the line that matches the *expression*. |
| **\| exclude** | (Optional) Display excludes lines that match the *expression*. |
| **\| include** | (Optional) Display includes lines that match the specified *expression*. |
| *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 vtp counters** command. Table 2-29 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
---------------- ---------------- ---------------- --------------------------
Gi0/1            0                0                0
Gi0/2            0                0                0
```

***Table 2-29 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 | Number of revision errors.<br>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.<br>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. This error means that the VTP password in the two switches is different or that the switches have different configurations.<br>These errors means that the switch is filtering incoming advertisements, which causes the VTP database to become unsynchronized across the network. |

*Table 2-29 show vtp counters Field Descriptions (continued)*

| Field | Description |
|---|---|
| Number of configuration digest errors | Number of MD5 digest errors.<br>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.<br>These errors mean that the switch is filtering incoming advertisements, which causes the VTP database to become unsynchronized across the network. |
| Number of V1 summary errors | Number of Version 1 errors.<br>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. |
| 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 2-30 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 2-30 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 2-30 show vtp status Field Descriptions (continued)*

| Field | Description |
|---|---|
| VTP Operating Mode | Displays the VTP operating mode, which can be server, client, or transparent.<br><br>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.<br><br>**Note** 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.<br><br>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.<br><br>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. |
| 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 | Displays the date and time of the last configuration modification. Displays the IP address of the switch that caused the configuration change to the database. |

## Related Commands

| Command | Description |
|---|---|
| **clear vtp counters** | Clears the VTP and pruning counters. |
| **vtp (global configuration)** | Configures the VTP filename, interface name, domain name, and mode. |
| **vtp (VLAN configuration)** | Configures the VTP domain name, password, pruning, and mode. |