# 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 |
|---|---|
| 12.1(11)AX | 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 gigabitethernet2/0/1
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. |

# sdm prefer

Use the **sdm prefer** global configuration command to configure the template used in Switch Database Management (SDM) resource allocation. You can use a template to allocate system resources to best support the features being used in your application. Use a template to provide maximum system usage for unicast routing or for VLAN configuration, to change an aggregator template (Catalyst 3750-12S only) to a desktop template, or to select the dual IPv4 and IPv6 template to support IPv6 forwarding. Use the **no** form of this command to return to the default template.

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

**no sdm prefer**

## Syntax Description

| | |
|---|---|
| **access** | Provide maximum system usage for access control lists (ACLs). Use this template if you have a large number of ACLs. |
| **default** | Sets the switch to use the default template. On Catalyst 3750-12S switches, use with the **desktop** keyword to set the switch to the default desktop template. (Use the **no sdm prefer** command to set a desktop switch to the default desktop template or to set an aggregator switch to the default aggregator template.) |
| **dual-ipv4-and-ipv6** {**default** \| **routing** \| **vlan**} | Select a template that supports both IPv4 and IPv6 routing.<br>• **default**—Provide balance to IPv4 and IPv6 Layer 2 and Layer 3 functionality.<br>• **routing**—Provide maximum system usage for IPv4 and IPv6 routing, including IPv4 policy-based routing.<br>• **vlan**—Provide maximum system usage for IPv4 and IPv6 VLANs. |
| **routing** | Provide maximum system usage for unicast routing. You would typically use this template for a router or aggregator in the middle of a network. |
| **vlan** | Provide maximum system usage for VLANs. This template maximizes system resources for use as a Layer 2 switch with no routing. |
| **desktop** | Use only on a Catalyst 3750-12S switch (where aggregator templates are the default) to select the desktop **default**, **routing**, or **vlan** template. |

## Defaults

The default template provides a balance to all features.

## Command Modes

Global configuration

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The aggregator templates were added. |
| 12.2(25)SEA | The dual-ipv4-and-ipv6 templates were added. |

| Release | Modification |
|---|---|
| 12.2(25)SED | The access templates were added. |
| 12.2(25)SEE | The **dual-ipv4-and-ipv6 routing** template was added. |

## Usage Guidelines

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

Desktop switches support only desktop templates; an aggregator switch (Catalyst 3750-12S) supports both desktop and aggregator templates. On an aggregator switch, if you do not enter the desktop keyword, the aggregator templates are selected.

All stack members use the same SDM desktop or aggregator template, stored on the stack master. When a new switch member is added to a stack, as with the switch configuration file and VLAN database file, the SDM configuration that is stored on the master overrides the template configured on an individual switch.

To route IPv6 packets in a stack of switches, all switches in the stack should be running the IP services image. The IPv6 packets are routed in hardware across the stack, as long as the packet does not have exceptions (IPv6Options) and the switches have not run out of hardware resources.

If a member cannot support the template that is running on the master switch, the switch goes into SDM mismatch mode, the master switch does not attempt to change the SDM template, and the switch cannot be a functioning member of the stack.

- If the master switch is a Catalyst 3750-12S, and you change the template from an aggregator template to a desktop template and reload the switch, the entire stack operates with the selected desktop template. This could cause configuration losses if the number of ternary content addressable memory (TCAM) entries exceeds the desktop template sizes.
- If you change the template on a Catalyst 3750-12S master from a desktop template to an aggregator template and reload the switch, any desktop switches that were part of the stack go into SDM mismatch mode.
- If you add a Catalyst 3750-12S switch that is running the aggregator template to a stack that has a desktop switch as the master, the stack operates with the desktop template selected on the master. This could cause configuration losses on the Catalyst 3750-12S member if the number of TCAM entries on it exceeds desktop template sizes.

For more information about stacking, see the “Managing Switch Stacks” chapter in the software configuration guide.

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

The default templates balance the use of system resources.

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

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

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

Table 2-23 lists the approximate number of each resource supported in each of the IPv4-only templates for a desktop or aggregator switch. The values in the template are based on eight routed interfaces and approximately one thousand VLANs and represent the approximate hardware boundaries set when a template is selected. If a section of a hardware resource is full, all processing overflow is sent to the CPU, seriously impacting switch performance.

*Table 2-23 Approximate Number of Feature Resources Allowed by IPv4Templates*

| | Desktop Templates | | | | Aggregator Templates | | | |
|---|---|---|---|---|---|---|---|---|
| **Resource** | **Access** | **Default** | **Routing** | **VLAN** | **Access** | **Default** | **Routing** | **VLAN** |
| Unicast MAC addresses | 4 K | 6 K | 3 K | 12 K | 6 K | 6 K | 6 K | 12 K |
| Internet Group Management Protocol (IGMP) groups and multicast routes | 1 K | 1 K | 1 K | 1 K | 1 K | 1 K | 1 K | 1 K |
| Unicast routes | 6 K | 8 K | 11 K | 0 | 12 K | 12 K | 20 K | 0 |
| • Directly connected hosts | 4 K | 6 K | 3 K | 0 | 6 K | 6 K | 6 K | 0 |
| • Indirect routes | 2 K | 2 K | 8 K | 0 | 6 K | 6 K | 14 K | 0 |
| Policy-based routing access control entries (ACEs) | 512 | 0 | 512 | 0 | 512 | 0 | 512 | 0 |
| Quality of service (QoS) classification ACEs | 512 | 512 | 512 | 512 | 896 | 896 | 512 | 896 |
| Security ACEs | 2 K | 1 K | 1 K | 1 K | 4 K | 1 K | 1 K | 1 K |
| Layer 2 VLANs | 1 K | 1 K | 1 K | 1 K | 1 K | 1 K | 1 K | 1 K |

Table 2-24 lists the approximate number of each resource supported in each of the dual IPv4-and IPv6 templates for a desktop or aggregator switch.

*Table 2-24 Approximate Feature Resources Allowed by Dual IPv4-IPv6 Templates*

| | Desktop IPv4-and-IPv6 Templates | | | Aggregator IPv4-and-IPv6 Templates | | |
|---|---|---|---|---|---|---|
| **Resource** | **Default** | **Routing** | **VLAN** | **Default** | **Routing** | **VLAN** |
| Unicast MAC addresses | 2 K | 1536 | 8 K | 2 K | 2K | 8 K |
| IPv4 IGMP groups and multicast routes | 1 K | 1K | 1 K | 1 K | 1 K | 0 |
| Total IPv4 unicast routes: | 3 K | 2816 | 0 | 3 K | 8K | 0 |
| • Directly connected IPv4 hosts | 2 K | 1536 | 0 | 2 K | 2K | 0 |
| • Indirect IPv4 routes | 1 K | 1280 | 0 | 1 K | 6K | 1 K |
| IPv6 multicast groups | 1 K | 1152 | 1 K | 1 K | 2176 | 1 K |
| Total IPv6 unicast routes: | 3 K | 2816 | 0 | 3 K | 8K | 0 |
| • Directly connected IPv6 addresses | 2 K | 1536 | 0 | 2 K | 2K | 0 |
| • Indirect IPv6 unicast routes | 1 K | 1280 | 0 | 1 K | 6K | 0 |
| IPv4 policy-based routing ACEs | 0 | 256 | 0 | 0 | 512 | 0 |
| IPv4 or MAC QoS ACEs (total) | 512 | 512 | 512 | 876 | 896 | 876 |

*Table 2-24 Approximate Feature Resources Allowed by Dual IPv4-IPv6 Templates (continued)*

| Resource | Desktop IPv4-and-IPv6 Templates | | | Aggregator IPv4-and-IPv6 Templates | | |
|---|---|---|---|---|---|---|
| | Default | Routing | VLAN | Default | Routing | VLAN |
| IPv4 or MAC security ACEs (total) | 1 K | 512 | 1 K | 512 | 1K | 1 K |
| IPv6 policy-based routing ACEs[1] | 0 | 255 | 0 | 0 | 510 | 0 |
| IPv6 QoS ACEs | 510 | 510 | 510 | 876 | 510 | 876 |
| IPv6 security ACEs | 510 | 510 | 510 | 876 | 510 | 876 |

1. IPv6 policy-based routing is not supported in this release.

## Examples

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

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

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

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

This example shows how to configure the desktop routing template on an aggregator switch:

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

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

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

This example shows how to change a switch template to the default template. On an aggregator switch, this is the default aggregator template; on a desktop switch, this is the default desktop template.

```
Switch(config)# no sdm prefer
Switch#(config)# exit
Switch# reload
```

This example shows how to configure the desktop default template on an aggregator switch:

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

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

## Related Commands

| Command | Description |
|---|---|
| show sdm prefer | Displays the current SDM template in use or displays the templates that can be used, with approximate resource allocation per feature. |

# service password-recovery

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

**service password-recovery**

**no service password-recovery**

## Syntax Description

This command has no arguments or keywords.

## Defaults

The password-recovery mechanism is enabled.

## Command Modes

Global configuration

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | 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 holds down the **Mode** button while the unit powers up and for a second or two after the LED above port 1X turns off. When the button is released, the system continues with initialization.

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)?
```

**Note** If the user chooses not to reset the system to the default configuration, the normal bootup process continues, as if the **Mode button** had not been pressed. 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 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.

When you enter the **service password-recovery** or **no service password-recovery** command on the stack master, it is propagated throughout the stack and applied to all switches in the stack.

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 or switch stack 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 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 |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(25)SE | A policy map can now be applied to a physical port or an SVI. |
| 12.2(25)SED | Hierarchical policy-maps can now be applied to an SVI. |

## Usage Guidelines

Only one policy map per ingress port is supported.

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.

Policy maps that use the **police aggregate** command fail when applied to a 10-Gigabit Ethernet interface.

## Examples

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

```
Switch(config)# interface gigabitethernet2/0/1
Switch(config-if)# service-policy input plcmap1
```

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

```
Switch(config)# interface gigabitethernet2/0/1
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# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# access-list 101 permit ip any any
Switch(config)# class-map cm-1
Switch(config-cmap)# match access 101
Switch(config-cmap)# exit
Switch(config)# exit
Switch#
Switch#
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# class-map cm-interface-1
Switch(config-cmap)# match input gigabitethernet3/0/1 - gigabitethernet3/0/2
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)# interface vlan 10
Switch(config-if)#
Switch(config-if)# ser input vlan-plcmap
Switch(config-if)# exit
Switch(config)# exit
```

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. |

# session

Use the **session** privileged EXEC command on the stack master to access a specific stack member or to access the controller on a Catalyst 3750G Integrated Wireless LAN Controller Switch.

**session** *stack-member-number* [**processor 1**]

## Syntax Description

| | |
|---|---|
| *stack-member-number* | Specify the member number. The range is 1 to 9. |
| **processor 1** | (Optional) Specify the destination processor for the session, that is, the embedded controller in the Catalyst 3750G Integrated Wireless LAN Controller Switch. Entering this keyword puts you in the controller CLI.<br>**Note** This keyword applies only to a wireless LAN controller switch. |

## Defaults

No default is defined.

## Command Modes

Global configuration

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(25)FZ | The **processor** keyword was added for Catalyst 3750G Integrated Wireless LAN Controller Switch. |

## Usage Guidelines

When you access the member, its member number is appended to the system prompt.

Use the **session** command from the master to access a member switch.

Use the **session** command with **processor 1** from the master or a standalone switch to access the internal controller. A standalone switch is always member 1.

Use the **processor 1** keyword to change to the controller command-line interface. See the *Cisco Wireless LAN Controller Configuration Guide Release 4.0* for controller configuration information.

## Examples

This example shows how to access member 6:

```
Switch(config)# session 6
Switch-6#
```

This example shows how to access the controller on member 2, which is a Catalyst 3750G wireless LAN controller switch (standalone or stack master):

```
Switch# session 2 processor 1

(Cisco Controller)
User:
```

## Related Commands

| Command | Description |
|---|---|
| **reload** | Reloads the member and puts a configuration change into effect. |
| **switch** | Changes the member priority value. |
| **switch renumber** | Changes the member number. |
| **show switch** | Displays information about the stack and its members. |

# 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 |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(25)SE | The **ip dscp** *new-dscp* keyword was changed to **dscp** *new-dscp*.<br>The **set dscp** *new-dscp* command replaces the **set ip dscp** *new-dscp* command. |
| 12.2(25)SEC | The **ip** keyword is optional. |

## 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 |
|---|---|
| 12.1(11)AX | 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
- Whether the switch will be used as the cluster command switch and the cluster name

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

GigabitEthernet6/0/1 unassigned      YES unset  up                    up

GigabitEthernet6/0/2 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

Would you like to enable as a cluster command switch? [yes/no]: yes

Enter cluster name: cluster-name

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 GigabitEthernet6/0/1
no ip address
!
interface GigabitEthernet6/0/2
no ip address
!
```

```
cluster enable cluster-name
!
end
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. |
| **show version** | Displays version information for the hardware and firmware. |

# setup express

Use the **setup express** global configuration command to enable Express Setup mode. Use the **no** form of this command to disable Express Setup mode.

**setup express**

**no setup express**

## Syntax Description

This command has no arguments or keywords.

## Defaults

Express Setup is enabled.

## Command Modes

Global configuration

## Command History

| Release | Modification |
|---|---|
| 12.1(14)EA1 | This command was introduced. |

## Usage Guidelines

When Express Setup is enabled on a new (unconfigured) switch, pressing the Mode button for 2 seconds activates Express Setup. You can access the switch through an Ethernet port by using the IP address 10.0.0.1 and then can configure the switch with the web-based Express Setup program or the command-line interface (CLI)-based setup program.

When you press the Mode button for 2 seconds on a configured switch, the LEDs above the Mode button start blinking. If you press the Mode button for a total of 10 seconds, the switch configuration is deleted, and the switch reboots. The switch can then be configured like a new switch, either through the web-based Express Setup program or the CLI-based setup program.

**Note** As soon as you make any change to the switch configuration (including entering *no* at the beginning of the CLI-based setup program), configuration by Express Setup is no longer available. You can only run Express Setup again by pressing the Mode button for 10 seconds. This deletes the switch configuration and reboots the switch.

If Express Setup is active on the switch, entering the **write memory** or **copy running-configuration startup-configuration** privileged EXEC commands deactivates Express Setup. The IP address 10.0.0.1 is no longer valid on the switch, and your connection using this IP address ends.

The primary purpose of the **no setup express** command is to prevent someone from deleting the switch configuration by pressing the Mode button for 10 seconds.

## Examples

This example shows how to enable Express Setup mode:

```
Switch(config)# setup express
```

You can verify that Express Setup mode is enabled by pressing the Mode button:

- On an unconfigured switch, the LEDs above the Mode button turn solid green after 3 seconds.
- On a configured switch, the mode LEDs begin blinking after 2 seconds and turn solid green after 10 seconds.

**Caution** If you *hold* the Mode button down for a total of 10 seconds, the configuration is deleted, and the switch reboots.

This example shows how to disable Express Setup mode:

```
Switch(config)# no setup express
```

You can verify that Express Setup mode is disabled by pressing the Mode button. The mode LEDs do not turn solid green *or* begin blinking green if Express Setup mode is not enabled on the switch.

## Related Commands

| Command | Description |
|---|---|
| **show setup express** | Displays if Express Setup mode is active. |

# 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**]

## 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. |
| *expression* | Expression in the output to use as a reference point. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **ipc** keyword was added. |

## 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.

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

## 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. |
| **ip access list** | Configures a named IP access list on the switch. |
| **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**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(20)SE | 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 Network Assistant or the embedded device manager to download the image by using HTTP. The **show archive status** command shows the progress of the download.

## 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 arp access-list

Use the **show arp access-list** EXEC command to display detailed information about Address Resolution Protocol (ARP) access control (lists).

**show arp access-list** [*acl-name*]

## Syntax Description

| | |
|---|---|
| *acl-name* | (Optional) Name of the ACL. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Examples

This is an example of output from the **show arp access-list** command:

```
Switch# show arp access-list
ARP access list rose
    permit ip 10.101.1.1 0.0.0.255 mac any
    permit ip 20.3.1.0 0.0.0.255 mac any
```

## Related Commands

| Command | Description |
|---|---|
| **arp access-list** | Defines an ARP ACL. |
| **deny (ARP access-list configuration)** | Denies an ARP packet based on matches against the Dynamic Host Configuration Protocol (DHCP) bindings. |
| **ip arp inspection filter vlan** | Permits ARP requests and responses from a host configured with a static IP address. |
| **permit (ARP access-list configuration)** | Permits an ARP packet based on matches against the DHCP bindings. |

# show authentication

Use the **show authentication** EXEC command to display information about authentication manager events on the switch.

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

## Syntax Description

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

## Command Default

This command has no default settings.

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

Table 2-25 describes the significant fields shown in the output of the **show authentication** command.

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

*Table 2-25 show authentication Command Output*

| Field | Description |
|---|---|
| Idle | The session has been initialized and no methods have run yet. |
| Running | A method is running for this session. |
| No methods | No method has provided a result for this session. |
| Authc Success | A method has resulted in authentication success for this session. |
| Authc Failed | A method has resulted in authentication fail for this session. |
| Authz Success | All features have been successfully applied for this session. |
| Authz Failed | A feature has failed to be applied for this session. |

Table 2-26 lists the possible values for the state of methods. For a session in a terminal state, *Authc Success*, *Authc Failed*, or *Failed over* are displayed. *Failed over* means that an authentication method ran and then failed over to the next method, which did not provide a result. *Not run* appears for sessions that synchronized on standby.

*Table 2-26 State Method Values*

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

The output of the **show authentications sessions interface** command shows fields for *Security Policy* and *Security Status*. These fields apply only if Media Access Control Security (MACsec) is supported and enabled. This switch does not support MACsec.

## Examples

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

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

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

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

```
3 0 dot1x
Runnable methods list:
Handle Priority Name
3 0 dot1x
```

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

```
Switch# show authentication sessions
Interface  MAC Address     Method   Domain   Status         Session ID
Gi3/45     (unknown)       N/A      DATA     Authz Failed   0908140400000007003651EC
Gi3/46     (unknown)       N/A      DATA     Authz Success  0908140400000000080057C274
```

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

```
Switch# show authentication sessions int gigabitethernet 3/0/46
Interface:  GigabitEthernet3/0/46
          MAC Address:  Unknown
           IP Address:  Unknown
               Status:  Authz Success
               Domain:  DATA
       Oper host mode:  multi-host
     Oper control dir:  both
        Authorized By:  Guest Vlan
          Vlan Policy:  4094
      Session timeout:  N/A
         Idle timeout:  N/A
    Common Session ID:  0908140400000000080057C274
      Acct Session ID:  0x0000000A
               Handle:  0xCC000008
Runnable methods list:
       Method   State
       dot1x    Failed over
```

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

```
Switch# show authentication sessions mac 000e.84af.59bd
Interface: GigabitEthernet3/0/46
MAC Address: 000e.84af.59bd
Status: Authz Success
Domain: DATA
Oper host mode: single-host
Authorized By: Authentication Server
Vlan Policy: 10
Handle: 0xE0000000
Runnable methods list:
Method State
dot1x Authc Success
```

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

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

## Related Commands

| Command | Description |
|---|---|
| authentication control-direction | Configures the port mode as unidirectional or bidirectional. |
| authentication event | Sets the action for specific authentication events. |

| Command | Description |
|---|---|
| **authentication fallback** | Configures a port to use web authentication as a fallback method for clients that do not support IEEE 802.1x authentication. |
| **authentication host-mode** | Sets the authorization manager mode on a port. |
| **authentication open** | Enables or disables open access on a port. |
| **authentication order** | Sets the order of authentication methods used on a port. |
| **authentication periodic** | Enables or disables reauthentication on a port. |
| **authentication port-control** | Enables manual control of the port authorization state. |
| **authentication priority** | Adds an authentication method to the port-priority list. |
| **authentication timer** | Configures the timeout and reauthentication parameters for an 802.1x-enabled port. |

# show auto qos

To display the quality of service (QoS) commands entered on the interfaces on which automatic QoS (auto-QoS) is enabled, use the **show auto qos** command in EXEC mode.

**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
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(14)EA1 | This command was introduced. |
| 12.2(20)SE | The information in the command output changed, and the user guidelines were updated. |
| 12.2(40)SE | The information in the command output changed. |

## 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.

The **show auto qos** command output also shows the service policy information for the Cisco IP phone.

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
GigabitEthernet2/0/4
auto qos voip cisco-softphone

GigabitEthernet2/0/5
auto qos voip cisco-phone

GigabitEthernet2/0/6
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 2/0/5
GigabitEthernet2/0/5
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
!
policy-map AutoQoS-Police-CiscoPhone
  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 GigabitEthernet2/0/4
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
 priority-queue out
 auto qos voip cisco-softphone
!
interface GigabitEthernet2/0/5
 switchport mode access
 switchport port-security maximum 1999
 speed 100
 duplex full
 srr-queue bandwidth share 10 10 60 20
 priority-queue out
 mls qos trust device cisco-phone
 mls qos trust cos
 auto qos voip cisco-phone
!
interface GigabitEthernet2/0/6
switchport trunk encapsulation dot1q
 switchport trunk native vlan 2
 switchport mode access
 speed 10
 srr-queue bandwidth share 10 10 60 20
 priority-queue out
 mls qos trust device cisco-phone
 mls qos trust cos
```

```
 auto qos voip cisco-phone
!
interface GigabitEthernet4/0/1
srr-queue bandwidth share 10 10 60 20
 priority-queue out
 mls qos trust device cisco-phone
 mls qos trust cos
 mls qos trust device cisco-phone
service-policy input AutoQoS-Police-CiscoPhone

<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 fastethernet1/0/2
FastEthernet1/0/2
auto qos voip cisco-softphone
```

This is an example 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
```

This is an example of output from the **show auto qos** i**nterface** *interface-id* command when auto-QoS is disabled on an interface:

```
Switch# show auto qos interface gigabitethernet3/0/1
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**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Examples

This is an example of output from the **show boot** command. Table 2-27 describes each field in the display.

```
Switch# show boot
BOOT path-list      :flash:/image
Config file         :flash:/config.text
Private Config file :flash:/private-config.text
Enable Break        :no
Manual Boot         :yes
HELPER path-list    :
Auto upgrade        :yes
------------------
```

For switch stacks, information is shown for each switch in the stack.

*Table 2-27 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 up.<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>If the BOOT variable is set but the specified images cannot be loaded, the system attempts to boot up with 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 up is enabled or disabled. If it is set to yes, on, or 1, you can interrupt the automatic bootup process by pressing the Break key on the console after the flash file system is initialized. |

*Table 2-27 show boot Field Descriptions*

| Field | Description |
|---|---|
| Manual Boot | Displays whether the switch automatically or manually boots up. If it is set to no or 0, the bootloader attempts to automatically boot up the system. If it is set to anything else, you must manually boot up the switch from the bootloader mode. |
| Helper path-list | Displays a semicolon separated list of loadable files to dynamically load during the bootloader initialization. Helper files extend or patch the functionality of the bootloader. |
| Auto upgrade | Displays whether the switch stack is set to automatically copy its software version to an incompatible switch so that it can join the stack.<br>A switch in version-mismatch mode is a switch that has a different stack protocol version than the version on the stack. Switches in version-mismatch mode cannot join the stack. If the stack has an image that can be copied to a switch in version-mismatch mode, and if the **boot auto-copy-sw** feature is enabled, the stack automatically copies the image from another stack member to the switch in version-mismatch mode. The switch then exits version-mismatch mode, reboots, and joins the stack. |

**Related Commands**

| Command | Description |
|---|---|
| **boot auto-copy-sw** | Enables the automatic upgrade (auto-upgrade) process to automatically upgrade a switch in version-mismatch mode. |
| **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 up the switch during the next bootup 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 bootup cycle. |

# show cable-diagnostics tdr

Use the **show cable-diagnostics tdr** privileged EXEC command to display the Time Domain Reflector (TDR) results.

**show cable-diagnostics tdr interface** *interface-id*

## Syntax Description

| | |
|---|---|
| *interface-id* | Specify the interface on which TDR was run. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(19)EA1 | This command was introduced. |

## Usage Guidelines

TDR is supported only on 10/100/100 copper Ethernet ports. It is not supported on 10/100 ports, 10-Gigabit module ports, or on SFP module ports. For more information about TDR, see the software configuration guide for this release.

## Examples

This is an example of output from the **show cable-diagnostics tdr interface** *interface-id* command on a switch other than a Catalyst 3750G-24PS or 3750G-48PS switch:

```
Switch# show cable-diagnostics tdr interface gigabitethernet1/0/2
TDR test last run on: March 01 20:15:40
Interface Speed Local pair Pair length        Remote pair Pair status
--------- ----- ---------- ------------------ ----------- --------------------
Gi1/0/2     auto  Pair A     0    +/- 2  meters N/A         Open

                  Pair B     0    +/- 2  meters N/A         Open
                  Pair C     0    +/- 2  meters N/A         Open
                  Pair D     0    +/- 2  meters N/A         Open
```

This is an example of output from the **show cable-diagnostics tdr interface** *interface-id* command on a Catalyst 3750G-24PS or 3750G-48PS switch:

```
Switch# show cable-diagnostics tdr interface gigabitethernet1/0/2
TDR test last run on: March 01 20:15:40
Interface Speed Local pair Pair length        Remote pair Pair status
--------- ----- ---------- ------------------ ----------- --------------------
Gi1/0/2   auto  Pair A     0    +/- 4 meters  N/A         Open

                Pair B     0    +/- 4 meters  N/A         Open
                Pair C     0    +/- 4 meters  N/A         Open
                Pair D     0    +/- 4 meters  N/A         Open
```

Table 2-28 lists the descriptions of the fields in the **show cable-diagnostics tdr** command output.

*Table 2-28 Fields Descriptions for the show cable-diagnostics tdr Command Output*

| Field | Description |
|---|---|
| Interface | Interface on which TDR was run. |
| Speed | Speed of connection. |
| Local pair | Name of the pair of wires that TDR is testing on the local interface. |
| Pair length | Location on the cable where the problem is, with respect to your switch. TDR can only find the location in one of these cases:<br>• The cable is properly connected, the link is up, and the interface speed is 1000 Mb/s.<br>• The cable is open.<br>• The cable has a short. |
| Remote pair | Name of the pair of wires to which the local pair is connected. TDR can learn about the remote pair only when the cable is properly connected and the link is up. |
| Pair status | The status of the pair of wires on which TDR is running:<br>• Normal—The pair of wires is properly connected.<br>• Not completed—The test is running and is not completed.<br>• Not supported—The interface does not support TDR.<br>• Open—The pair of wires is open.<br>• Shorted—The pair of wires is shorted.<br>• ImpedanceMis—The impedance is mismatched.<br>• Short/Impedance Mismatched—The impedance mismatched or the cable is short.<br>• InProgress—The diagnostic test is in progress |

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

```
Switch# show interfaces gigabitethernet1/01/2
Switch# show interfaces gigabitethernet0/2
gigabitethernet1/0/2 is up, line protocol is up (connected: TDR in Progress)
```

This is an example of output from the **show cable-diagnostics tdr interface** *interface-id* command when TDR is not running:

```
Switch# show cable-diagnostics tdr interface gigabitethernet1/01/2
% TDR test was never issued on Gi1/0/2
```

If an interface does not support TDR, this message appears:

```
% TDR test is not supported on switch 1
```

## Related Commands

| Command | Description |
|---|---|
| test cable-diagnostics tdr | Enables and runs TDR on an interface. |

# show cdp forward

To display the CDP forwarding table, use the **show cdp forward** command in EXEC mode.

**show cdp forward** [**entry** | **forward** | **interface** *interface-id* | **neighbor** | **traffic**]

## Syntax Description

| | |
|---|---|
| **entry** | (Optional) Displays information about a specific neighbor entry. |
| **forward** | (Optional) Displays the CDP forwarding information. |
| **interface** *interface-id* | (Optional) Displays the CDP interface status and configuration. |
| **neighbor** | (Optional) Displays the CDP neighbor entries. |
| **traffic** | (Optional) Displays the CDP statistics. |

## Command Modes

Use EXEC
Privileted EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(53)SE | This command was introduced. |

## Usage Guidelines

The **show cdp forward** command output shows the number of CDP packets forwarded on each ingress-port- to-egress-port mapping and the statistics for forwarded and dropped packets.

## Examples

```
Switch# show cdp forward
Ingress         Egress         # packets         # packets
Port            Port           forwarded         dropped
-------------------------------------------------------------
 Gi2/0/2        Gi2/0/13            0                0
```

## Related Commands

| Command | Description |
|---|---|
| **cdp forward** | Configures the ingress and egress switch ports for CDP traffic. |

# show cisp

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

**show cisp** {[**interface** *interface-id*] | **clients** | **summary**}

## Syntax Description

| | |
|---|---|
| **clients** | (Optional) Display CISP client details |
| **interface** *interface-id* | (Optional) Display CISP information about the specified interface. Valid interfaces include physical ports and port channels. |
| **summary** | (Optional) Display |
| *expression* | Expression in the output to use as a reference point. |

## Command Modes

Global configuration

## Command History

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

## Examples

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

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

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

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

## Related Commands

| Command | Description |
|---|---|
| **dot1x credentials** *profile* | Configure a profile on a supplicant switch |
| **cisp enable** | Enable Client Information Signalling Protocol (CISP) |

# show class-map

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

**show class-map** [*class-map-name*]

## Syntax Description

| | |
|---|---|
| *class-map-name* | (Optional) Display the contents of the specified class map. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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 cluster

Use the **show cluster** EXEC command to display the cluster status and a summary of the cluster to which the switch belongs. This command can be entered on the cluster command switch and cluster member switches.

**show cluster**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

If you enter this command on a switch that is not a cluster member, the error message `Not a management cluster member` appears.

On a cluster member switch, this command displays the identity of the cluster command switch, the switch member number, and the state of its connectivity with the cluster command switch.

On a cluster command switch stack or cluster command switch, this command displays the cluster name and the total number of members. It also shows the cluster status and time since the status changed. If redundancy is enabled, it displays the primary and secondary command-switch information.

## Examples

This is an example of output when the **show cluster** command is entered on the cluster command switch:

```
Switch# show cluster
Command switch for cluster "Ajang"
        Total number of members:        7
        Status:                         1 members are unreachable
        Time since last status change:  0 days, 0 hours, 2 minutes
        Redundancy:                     Enabled
                Standby command switch: Member 1
                Standby Group:          Ajang_standby
                Standby Group Number:   110
        Heartbeat interval:             8
        Heartbeat hold-time:            80
        Extended discovery hop count:   3
```

This is an example of output when the **show cluster** command is entered on a cluster member switch:

```
Switch1> show cluster
Member switch for cluster "hapuna"
        Member number:                  3
        Management IP address:          192.192.192.192
        Command switch mac address:     0000.0c07.ac14
        Heartbeat interval:             8
        Heartbeat hold-time:            80
```

This is an example of output when the **show cluster** command is entered on a cluster member switch that is configured as the standby cluster command switch:

```
Switch# show cluster
Member switch for cluster "hapuna"
        Member number:                  3 (Standby command switch)
        Management IP address:          192.192.192.192
        Command switch mac address:     0000.0c07.ac14
        Heartbeat interval:             8
        Heartbeat hold-time:            80
```

This is an example of output when the **show cluster** command is entered on the cluster command switch that has lost connectivity with member 1:

```
Switch# show cluster
Command switch for cluster "Ajang"
        Total number of members:        7
        Status:                         1 members are unreachable
        Time since last status change:  0 days, 0 hours, 5 minutes
        Redundancy:                     Disabled
        Heartbeat interval:             8
        Heartbeat hold-time:            80
        Extended discovery hop count:   3
```

This is an example of output when the **show cluster** command is entered on a cluster member switch that has lost connectivity with the cluster command switch:

```
Switch# show cluster
Member switch for cluster "hapuna"
        Member number:                  <UNKNOWN>
        Management IP address:          192.192.192.192
        Command switch mac address:     0000.0c07.ac14
        Heartbeat interval:             8
        Heartbeat hold-time:            80
```

## Related Commands

| Command | Description |
|---|---|
| **cluster enable** | Enables a command-capable switch as the cluster command switch, assigns a cluster name, and optionally assigns a member number to it. |
| **show cluster candidates** | Displays a list of candidate switches. |
| **show cluster members** | Displays information about the cluster members. |

# show cluster candidates

Use the **show cluster candidates** EXEC command to display a list of candidate switches.

**show cluster candidates** [**detail** | **mac-address** *H.H.H.*]

## Syntax Description

| | |
|---|---|
| **detail** | (Optional) Display detailed information for all candidates. |
| **mac-address** *H.H.H.* | (Optional) MAC address of the cluster candidate. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

This command is available only on the cluster command switch stack or cluster command switch.

If the switch is not a cluster command switch, the command displays an empty line at the prompt.

The SN in the display means *switch member number*. If E appears in the SN column, it means that the switch is discovered through extended discovery. If E does not appear in the SN column, it means that the *switch member number* is the upstream neighbor of the candidate switch. The hop count is the number of devices the candidate is from the cluster command switch.

## Examples

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

```
Switch# show cluster candidates
                                                                  |---Upstream---|
       MAC Address    Name          Device Type      PortIf  FEC Hops SN PortIf  FEC
       00d0.7961.c4c0 StLouis-2     WS-C3750-12T     Gi6/0/1        2   1  Fa0/11
       00d0.bbf5.e900 ldf-dist-128 WS-C3524-XL      Fa0/7          1   0  Fa0/24
       00e0.1e7e.be80 1900_Switch   1900             3        0     1   0  Fa0/11
       00e0.1e9f.7a00 Surfers-24    WS-C2924-XL      Fa0/5          1   0  Fa0/3
       00e0.1e9f.8c00 Surfers-12-2 WS-C2912-XL      Fa0/4          1   0  Fa0/7
       00e0.1e9f.8c40 Surfers-12-1 WS-C2912-XL      Fa0/1          1   0  Fa0/9
```

This is an example of output from the **show cluster candidates** command that uses the MAC address of a cluster member switch directly connected to the cluster command switch:

```
Switch# show cluster candidates mac-address 00d0.7961.c4c0
Device 'Tahiti-12' with mac address number 00d0.7961.c4c0
        Device type:            cisco WS-C3750-12T
        Upstream MAC address:   00d0.796d.2f00 (Cluster Member 0)
        Local port:             Gi6/0/1   FEC number:
        Upstream port:          GI6/0/11  FEC Number:
Hops from cluster edge: 1
        Hops from command device: 1
```

This is an example of output from the **show cluster candidates** command that uses the MAC address of a cluster member switch three hops from the cluster edge:

```
Switch# show cluster candidates mac-address 0010.7bb6.1cc0
Device 'Ventura' with mac address number 0010.7bb6.1cc0
        Device type:            cisco WS-C2912MF-XL
        Upstream MAC address:   0010.7bb6.1cd4
        Local port:             Fa2/1   FEC number:
        Upstream port:          Fa0/24  FEC Number:
        Hops from cluster edge: 3
        Hops from command device: -
```

This is an example of output from the **show cluster candidates detail** command:

```
Switch# show cluster candidates detail
Device 'Tahiti-12' with mac address number 00d0.7961.c4c0
        Device type:            cisco WS-C3512-XL
        Upstream MAC address:   00d0.796d.2f00 (Cluster Member 1)
        Local port:             Fa0/3   FEC number:
        Upstream port:          Fa0/13  FEC Number:
        Hops from cluster edge: 1
        Hops from command device: 2
Device '1900_Switch' with mac address number 00e0.1e7e.be80
        Device type:            cisco 1900
        Upstream MAC address:   00d0.796d.2f00 (Cluster Member 2)
        Local port:             3       FEC number: 0
        Upstream port:          Fa0/11  FEC Number:
        Hops from cluster edge: 1
        Hops from command device: 2
Device 'Surfers-24' with mac address number 00e0.1e9f.7a00
        Device type:            cisco WS-C2924-XL
        Upstream MAC address:   00d0.796d.2f00 (Cluster Member 3)
        Local port:             Fa0/5   FEC number:
        Upstream port:          Fa0/3   FEC Number:
        Hops from cluster edge: 1
        Hops from command device: 2
```

## Related Commands

| Command | Description |
|---|---|
| **show cluster** | Displays the cluster status and a summary of the cluster to which the switch belongs. |
| **show cluster members** | Displays information about the cluster members. |

# show cluster members

Use the **show cluster members** privileged EXEC command to display information about the cluster members.

**show cluster members** [*n* | **detail**]

## Syntax Description

| | |
|---|---|
| *n* | (Optional) Number that identifies a cluster member. The range is 0 to 15. |
| **detail** | (Optional) Display detailed information for all cluster members. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

This command is available only on the cluster command switch stack or cluster command switch.

If the cluster has no members, this command displays an empty line at the prompt.

## Examples

This is an example of output from the **show cluster members** command. The SN in the display means *switch number.*

```
Switch# show cluster members
                                                |---Upstream---|
SN MAC Address    Name         PortIf FEC Hops   SN PortIf  FEC  State
0  0002.4b29.2e00 StLouis1                0                   Up   (Cmdr)
1  0030.946c.d740 tal-switch-1 Fa0/13      1     0  Gi0/1       Up
2  0002.b922.7180 nms-2820     10      0   2     1  Fa0/18      Up
3  0002.4b29.4400 SanJuan2     Gi0/1       2     1  Fa0/11      Up
4  0002.4b28.c480 GenieTest    Gi0/2       2     1  Fa0/9       Up
```

This is an example of output from the **show cluster members** for cluster member 3:

```
Switch# show cluster members 3
Device 'SanJuan2' with member number 3
        Device type:            cisco WS-C3750
        MAC address:            0002.4b29.4400
        Upstream MAC address:   0030.946c.d740 (Cluster member 1)
        Local port:             Gi6/0/1   FEC number:
        Upstream port:          GI6/0/11  FEC Number:
        Hops from command device: 2
```

This is an example of output from the **show cluster members detail** command:

```
Switch# show cluster members detail
Device 'StLouis1' with member number 0 (Command Switch)
        Device type:            cisco WS-C3750
        MAC address:            0002.4b29.2e00
        Upstream MAC address:
        Local port:                     FEC number:
        Upstream port:                  FEC Number:
```

```
        Hops from command device: 0
Device 'tal-switch-14' with member number 1
        Device type:            cisco WS-C3548-XL
        MAC address:            0030.946c.d740
        Upstream MAC address:   0002.4b29.2e00 (Cluster member 0)
        Local port:             Fa0/13  FEC number:
        Upstream port:          Gi0/1   FEC Number:
        Hops from command device: 1
Device 'nms-2820' with member number 2
        Device type:            cisco 2820
        MAC address:            0002.b922.7180
        Upstream MAC address:   0030.946c.d740 (Cluster member 1)
        Local port:             10      FEC number: 0
        Upstream port:          Fa0/18  FEC Number:
        Hops from command device: 2
Device 'SanJuan2' with member number 3
        Device type:            cisco WS-C3750
        MAC address:            0002.4b29.4400
        Upstream MAC address:   0030.946c.d740 (Cluster member 1)
        Local port:             Gi6/0/1   FEC number:
        Upstream port:          Fa6/0/11  FEC Number:
        Hops from command device: 2
Device 'GenieTest' with member number 4
        Device type:            cisco SeaHorse
        MAC address:            0002.4b28.c480
        Upstream MAC address:   0030.946c.d740 (Cluster member 1)
        Local port:             Gi0/2   FEC number:
        Upstream port:          Fa0/9   FEC Number:
        Hops from command device: 2
Device 'Palpatine' with member number 5
        Device type:            cisco WS-C2924M-XL
        MAC address:            00b0.6404.f8c0
        Upstream MAC address:   0002.4b29.2e00 (Cluster member 0)
        Local port:             Gi2/1   FEC number:
        Upstream port:          Gi0/7   FEC Number:
        Hops from command device: 1
```

## Related Commands

| Command | Description |
|---|---|
| **show cluster** | Displays the cluster status and a summary of the cluster to which the switch belongs. |
| **show cluster candidates** | Displays a list of candidate switches. |

# 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**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

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

## 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**}] [**fastethernet 0**]

## Syntax Description

| | |
|---|---|
| *interface-id* | The physical interface (including type, stack member, 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. |

## Command Modes

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

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(20)SE | The display was enhanced to show the XENPAK module serial EEPROM contents. |

## 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.

## Examples

This is an example of output from the **show controllers ethernet-controller** command for an interface. Table 2-29 lists the *Transmit* fields, and Table 2-30 lists the *Receive* fields.

```
Switch# show controllers ethernet-controller gigabitethernet6/0/1
Transmit GigabitEthernet6/0/1              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 2-29 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. |
| 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. |

*Table 2-29 Transmit Field Descriptions (continued)*

| Field | Description |
|---|---|
| 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 2-30 Receive Field Descriptions*

| Field | Description |
|---|---|
| Bytes | The total amount of memory (in bytes) used by frames received on an interface, including the FCS 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. |
| 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. |

*Table 2-30 Receive Field Descriptions (continued)*

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

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

```
Switch# show controllers ethernet-controller gigabitethernet1/0/2 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 tengigabitethernet1/0/1 phy** command for the 10-Gigabit Ethernet interface. It shows the XENPAK module serial EEPROM contents.

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

http://www.xenpak.org/MSA/XENPAK_MSA_R2.1.pdf

http://www.xenpak.org/MSA/XENPAK_MSA_R3.0.pdf

To determine which version of the XENPAK documentation to read, check the *XENPAK MSA Version supported* field in the display. Version 2.1 is 15 hexadecimal, and Version 3.0 is 1e hexadecimal.

```
Switch# show controllers ethernet-controller tengigabitethernet1/0/1 phy

TenGigabitEthernet1/0/1 (gpn:472, port-number:1)
------------------------------------------------------------

XENPAK Serial EEPROM Contents:
Non-Volatile Register (NVR) Fields
 XENPAK MSA Version supported         :0x15
 NVR Size in bytes                    :0x100
 Number of bytes used                 :0xD0
 Basic Field Address                  :0xB
 Customer Field Address               :0x77
 Vendor Field Address                 :0xA7
 Extended Vendor Field Address        :0x100
 Reserved                             :0x0
 Transceiver type                     :0x1 =XENPAK
 Optical connector type               :0x1 =SC
 Bit encoding                         :0x1 =NRZ
 Normal BitRate in multiple of 1M b/s :0x2848
 Protocol Type                        :0x1 =10GgE

Standards Compliance Codes :
 10GbE Code Byte 0                    :0x2 =10GBASE-LR
 10GbE Code Byte 1                    :0x0
 SONET/SDH Code Byte 0                :0x0
 SONET/SDH Code Byte 1                :0x0
 SONET/SDH Code Byte 2                :0x0
 SONET/SDH Code Byte 3                :0x0
```

```
 10GFC Code Byte 0                    :0x0
 10GFC Code Byte 1                    :0x0
 10GFC Code Byte 2                    :0x0
 10GFC Code Byte 3                    :0x0
 Transmission range in 10m            :0x3E8
Fibre Type :
 Fibre Type Byte 0                    :0x40 =NDSF only
 Fibre Type Byte 1                    :0x0 =Unspecified

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

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

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

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

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 idprom** | Displays the IDPROM information for the specified interface. |

# show controllers power inline

Use the **show controllers power inline** command in EXEC mode to display the values in the registers of the specified Power over Ethernet (PoE) controller.

**show controllers power inline** [*instance*] [*module switch-number*]

## Syntax Description

| | | |
|---|---|---|
| *instance* | (Optional) Power controller instance, where each instance corresponds to four ports. See the "Usage Guidelines" section for more information. If no instance is specified, information for all instances appear. | |
| **module** *switch number* | **Note** | (Optional) Limit the display to ports on the specified stack member. The switch number is 1 to 9. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(19)EA1 | This command was introduced. |

## Usage Guidelines

For the Catalyst 3750-48PS switches, the *instance* range is 0 to 11.

For the Catalyst 3750-24PS switches, the *instance* range is 0 to 5.

For the Catalyst 3750G-48PS switches, the *instance* range is 0 to 2. For instances other than 0 to 2, the switches provides no output.

For the Catalyst 3750G-24PS switches, the *instance* range is 0 to 1. For instances other than 0 to 1, the switches provides no output.

Though visible on all switches, this command is valid only for PoE switches. It provides no information for switches that do not support PoE.

The output provides information that might be useful for Cisco technical support representatives troubleshooting the switch.

## Examples

This is an example of output from the **show controllers power inline** command on a switch other than a Catalyst 3750G-48PS or 3750G-24PS switch:

```
Switch# show controllers power inline
Module 1, Controller Instance 0, Address 0x40
  Interrupt           Reg 0x0  = 0x0
  Intr Mask           Reg 0x1  = 0xF6
  Power Event         Reg 0x2  = 0x0
  Detect Event        Reg 0x4  = 0x0
  Fault Event         Reg 0x6  = 0x0
  T-Start Event       Reg 0x8  = 0x0
  Supply Event        Reg 0xA  = 0x0
  Port 1 Status       Reg 0xC  = 0x24
  Port 2 Status       Reg 0xD  = 0x24
  Port 3 Status       Reg 0xE  = 0x3
  Port 4 Status       Reg 0xF  = 0x3
  Power Status        Reg 0x10 = 0xFF
  Pin Status          Reg 0x11 = 0x0
  Operating Mode      Reg 0x12 = 0xAA
  Disconnect Enable   Reg 0x13 = 0xA0
  Detect/Class Enable Reg 0x14 = 0xFF
  Reserved            Reg 0x15 = 0x0
  Timing Config       Reg 0x16 = 0x2
  Misc Config         Reg 0x17 = 0xA0
  ID Revision         Reg 0x1A = 0x64

Module 1, Controller Instance 1, Address 0x42
<output truncated>
```

This is an example of output from the **show controllers power inline** command on a Catalyst 3750G-24PS switch:

```
Switch# show controllers power inline
Alchemy instance 0, address 0
 Pending event flag    :N N N N N N N N N N N N
 Current State         :00 05 10 51 61 11
 Current Event         :00 01 00 10 40 00
 Timers                :00 C5 57 03 12 20 04 B2 05 06 07 07
 Error State           :00 00 00 00 10 00
 Error Code            :00 00 00 00 00 00 00 00 00 00 00 00
 Power Status          :N Y N N Y N N N N N N N
 Auto Config           :N Y Y N Y Y Y Y Y Y Y Y
 Disconnect            :N N N N N N N N N N N N
 Detection Status      :00 00 00 30 00 00
 Current Class         :00 00 00 30 00 00
 Tweetie debug         :00 00 00 00
 POE Commands pending at sub:
     Command 0 on each port :00 00 00 00 00 00
     Command 1 on each port :00 00 00 00 00 00
     Command 2 on each port :00 00 00 00 00 00
     Command 3 on each port :00 00 00 00 00 00
```

## Related Commands

| Command | Description |
|---|---|
| **logging event power-inline-status** | Enables the logging of PoE events. |
| **power inline** | Configures the power management mode for the specified PoE port or for all PoE ports. |
| **show power inline** | Displays the PoE status for the specified PoE port or for all PoE ports. |

# 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**]

## 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. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **asic** [**number**] keywords were added. |

## Usage Guidelines

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

## 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 command** in EXEC mode to display bandwidth utilization on the switch or specific ports.

**show controllers** [*interface-id*] **utilization**

## Syntax Description

| | |
|---|---|
| *interface-id* | (Optional) ID of the switch interface. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Examples

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

```
Switch# show controllers utilization
Port       Receive Utilization  Transmit Utilization
Fa1/0/1            0                    0
Fa1/0/2            0                    0
Fa1/0/3            0
Fa1/0/4            0                    0
Fa1/0/5            0                    0
Fa1/0/6            0                    0
Fa1/0/7            0                    0
<output truncated>

<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 gigabitethernet1/0/1 utilization
Receive Bandwidth Percentage Utilization   : 0
Transmit Bandwidth Percentage Utilization  : 0
```

*Table 2-31 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 diagnostic

Use the **show diagnostic** command in EXEC mode to view the test results of the online diagnostics and to list the supported test suites.

**show diagnostic content switch** [*num* | **all**]

**show diagnostic post**

**show diagnostic result switch** [*num* | **all**] [**detail** | **test** {*test-id* | *test-id-range* | **all**} [**detail**]]

**show diagnostic schedule switch** [*num* | **all**]

**show diagnostic status**

**show diagnostic switch** [*num* | **all**] [**detail**]

## Syntax Description

| | |
|---|---|
| **content** | Display test information including test ID, test attributes, and supported coverage test levels for each test and for all modules. |
| **switch** *num* | Specify the switch number. The range is from 1 to 9. |
| **switch all** | Specify all of the switches in the switch stack. |
| **post** | Display the power-on self-test (POST) results; the command output is the same as the **show post** command. |
| **result** | Displays the test results. |
| **detail** | (Optional) Displays the all test statistics. |
| **test** | Specify a test. |
| *test-id* | Identification number for the test; see the "Usage Guidelines" section for additional information. |
| *test-id-range* | Range of identification numbers for tests; see the "Usage Guidelines" section for additional information. |
| *all* | All the tests. |
| **schedule** | Displays the current scheduled diagnostic tasks. |
| **status** | Displays the test status. |

## Defaults

This command has no default settings.

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

If you do not enter a switch *num*, information for all switches is displayed.

In the command output, the possible testing results are as follows:

- Passed (.)
- Failed (F)
- Unknown (U)

## Examples

This example shows how to display the online diagnostics that are configured on a switch:

```
Switch# show diagnostic content switch 3

Switch 3:
Diagnostics test suite attributes:
    B/* - Basic ondemand test / NA
  P/V/* - Per port test / Per device test / NA
  D/N/* - Disruptive test / Non-disruptive test / NA
    S/* - Only applicable to standby unit / NA
    X/* - Not a health monitoring test / NA
    F/* - Fixed monitoring interval test / NA
    E/* - Always enabled monitoring test / NA
    A/I - Monitoring is active / Monitoring is inactive
    R/* - Switch will reload after test list completion / NA
    P/* - will partition stack / NA
                                                    Test Interval   Thre-
ID    Test Name                           attributes  day hh:mm:ss.ms shold
==== ================================== ============ =============== =====
 1)    TestPortAsicStackPortLoopback     B*N****A**   000 00:01:00.00  n/a
 2)    TestPortAsicLoopback              B*D*X**IR*   not configured  n/a
 3)    TestPortAsicCam                   B*D*X**IR*   not configured  n/a
 4)    TestPortAsicRingLoopback          B*D*X**IR*   not configured  n/a
 5)    TestMicRingLoopback               B*D*X**IR*   not configured  n/a
 6)    TestPortAsicMem                   B*D*X**IR*   not configured  n/a
```

This example shows how to display the online diagnostic results for a switch:

```
Switch# show diagnostic result switch 1
Switch 1: SerialNo :
Overall diagnostic result: PASS
Test results: (. = Pass, F = Fail, U = Untested)
1) TestPortAsicStackPortLoopback ---> .
2) TestPortAsicLoopback ------------> .
3) TestPortAsicCam -----------------> .
4) TestPortAsicRingLoopback --------> .
5) TestMicRingLoopback -------------> .
6) TestPortAsicMem -----------------> .
```

This example shows how to display the online diagnostic test status:

```
Switch# show diagnostic status
<BU> - Bootup Diagnostics, <HM> - Health Monitoring Diagnostics,
<OD> - OnDemand Diagnostics, <SCH> - Scheduled Diagnostics
====== ================================ ================================ ======
Card   Description                      Current Running Test             Run by
------ -------------------------------- --------------------             ------
1                                        N/A                              N/A
2                                        TestPortAsicStackPortLoopback    <OD>
                                         TestPortAsicLoopback             <OD>
                                         TestPortAsicCam                  <OD>
                                         TestPortAsicRingLoopback         <OD>
                                         TestMicRingLoopback              <OD>
                                         TestPortAsicMem                  <OD>
3                                        N/A                              N/A
4                                        N/A                              N/A
====== ================================ ================================ ======
Switch#
```

This example shows how to display the online diagnostic test schedule for a switch:

```
Switch# show diagnostic schedule switch 1
Current Time = 14:39:49 PST Tue Jul 5 2005
Diagnostic for Switch 1:
Schedule #1:
To be run daily 12:00
Test ID(s) to be executed: 1.
```

## Related Commands

| Command | Description |
|---|---|
| clear ip arp inspection statistics | Configures the health-monitoring diagnostic test. |
| diagnostic schedule | Sets the scheduling of test-based online diagnostic testing. |
| diagnostic start | Starts the online diagnostic test. |

# show dot1q-tunnel

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

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

## Syntax Description

| | |
|---|---|
| **interface** *interface-id* | (Optional) Specify the interface for which to display IEEE 802.1Q tunneling information. Valid interfaces include physical ports and port channels. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Examples

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

```
Switch# show dot1q-tunnel
dot1q-tunnel mode LAN Port(s)
------------------------------
Gi1/0/1
Gi1/0/2
Gi1/0/3
Gi1/0/6
Po2

Switch# show dot1q-tunnel interface gigabitethernet1/0/1
dot1q-tunnel mode LAN Port(s)
------------------------------
Gi1/0/1
```

## Related Commands

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

# show dot1x

Use the **show dot1x** command in EXEC mode 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**]]

## Syntax Description

| | |
|---|---|
| **all** [**summary**] | (Optional) Display the IEEE 802.1x status for all ports. |
| **interface** *interface-id* | **Note** (Optional) Display the IEEE 802.1x status for the specified port (including type, stack member, module, and port number) |
| **details** | (Optional) Display the IEEE 802.1x interface details. |
| **statistics** | (Optional) Display IEEE 802.1x statistics for the specified port. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **all** keyword was added. |
| 12.2(25)SED | The display was expanded to include **auth-fail-vlan** in the authorization state machine state and port status fields. |
| 12.2(25)SEE | The command syntax was changed, and the command output was modified. |
| 12.2(35)SE | The display was expanded to include the status of a port that is configured as both a host and an IP phone (a Cisco IP phone or phone from another manufacturer). |

## 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)
```

## Examples

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

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

Dot1x Info for GigabitEthernet1/0/1
-----------------------------------
PAE                       = AUTHENTICATOR
PortControl               = AUTO
ControlDirection          = Both
HostMode                  = SINGLE_HOST
Violation Mode            = PROTECT
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** command:

```
Interface       PAE     Client          Status
------------------------------------------------------
Gi2/0/1         AUTH    none            UNAUTHORIZED
Gi2/0/2         AUTH    00a0.c9b8.0072  AUTHORIZED
Gi2/0/3         AUTH    none            UNAUTHORIZED
```

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

```
Switch# show dot1x interface gigabitethernet1/0/2
Dot1x Info for GigabitEthernet1/0/2
-----------------------------------
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** command:

```
Switch# show dot1x interface gigabitethernet1/0/2 details
Dot1x Info for GigabitEthernet1/0/2
-----------------------------------
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 gigabitethernet1/0/1 details
Dot1x Info for GigabitEthernet1/0/1
-----------------------------------
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* **details** commmand when a port is configured as both a host and an IP phone (a Cisco IP phone or phone from another manufacturer). The HostMode field shows `MULTI-DOMAIN`.

```
Switch# show dot1x interface gigabitEthernet 2/0/3 details

Dot1x Info for GigabitEthernet2/0/3
-----------------------------------
PAE = AUTHENTICATOR
PortControl = AUTO
ControlDirection = Both
HostMode = MULTI_DOMAIN
ReAuthentication = Disabled
QuietPeriod = 60
ServerTimeout = 30
SuppTimeout = 30
ReAuthPeriod = 3600 (Locally configured)
ReAuthMax = 2
MaxReq = 2
TxPeriod = 1
RateLimitPeriod = 0
Mac-Auth-Bypass = Enabled
Critical-Auth = Enabled
Critical Recovery Action = Reinitialize
Critical-Auth VLAN = 10
Guest-Vlan = 15
```

```
Dot1x Authenticator Client List

------------------------------
Domain = DATA
Supplicant = 0000.aaaa.bbbb
Auth SM State = AUTHENTICATED
Auth BEND SM Stat = IDLE
Port Status = AUTHORIZED
Authentication Method = MAB
Vlan Policy = 20
```

This is an example of output from the **show dot1x interface** *interface-id* **statistics** command. Table 2-32 describes the fields in the display.

```
Switch# show dot1x interface gigabitethernet1/0/2 statistics
Dot1x Authenticator Port Statistics for GigabitEthernet1/0/2
-------------------------------------------
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 2-32 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. |
| 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*]

## Syntax Description

| | |
|---|---|
| **interface** *interface-id* | (Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, stack member, module, and port number). |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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 gigabitethernet1/0/1
DTP information for GigabitEthernet1/0/1:
  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*]

## 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* | **Note** (Optional) Display the EAP information for the specified port (including type, stack member, module, and port number). |

## 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.

## Examples

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

```
Switch# show eap sessions
Role:                   Authenticator   Decision:               Fail
Lower layer:            Dot1x-AuthenticaInterface:              Gi1/0/1
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:              Gi1/0/2
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 gigabitethernet1/0/1
Role:                   Authenticator   Decision:               Fail
Lower layer:            Dot1x-AuthenticaInterface:              Gi1/0/1
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 sessions | Clears EAP session information for the switch or for the specified port. |

# show env

Use the **show env** to show fan, temperature, redundant power system (RPS) availability, and power information for the switch (standalone switch, stack master, or stack member).

**show env** {**all** | **fan** | **power** | **rps** [**all** | **detail** | **switch** [*switch-number*]] | **stack** [*switch-number*] | **temperature** [**status**]}

## Syntax Description

| | |
|---|---|
| **all** | Display both fan and temperature environmental status. |
| **fan** | Display the switch fan status. |
| **power** | Display the switch power status. |
| **rps** | Display whether an RPS 300 Redundant Power System (RPS 300), Cisco RPS675 Redundant Power System (RPS 675), or the Cisco Redundant Power System 2300 (RPS 2300) is connected to the switch. |
| **rps all** | (Optional) Display all the redundant power systems that are connected to the standalone switch or the switch stack.<br>These keywords are available only on Catalyst 3750v2 switches. |
| **rps detail** | (Optional) Display the details about the redundant power systems that are connected to the switch or the switch stack.<br>These keywords are available only on Catalyst 3750v2 switches. |
| **rps switch** [*switch-number*] | (Optional) Display the redundant power systems that are connected to each switch in the stack or to the specified switch. For *switch-number*, the range is 1 to 9, depending on the switch member numbers in the stack.<br>These keywords are available only on Catalyst 3750v2 switches. |
| **stack** [*switch-number*] | **Note** Display all environmental status for each switch in the stack or for the specified switch. The range is 1 to 9, depending on the switch member numbers in the stack. |
| **temperature** | Display the switch temperature status. |
| **status** | (Optional) Display the switch internal temperature (not the external temperature) and the threshold values. This keyword is available only on the Catalyst 3750G-48TS, 3750G-48PS, 3750G-24TS-1U, and 3750G-24PS switches. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(20)SE3 | The **temperature status** keyword was added. |
| 12.2(50)SE1 | The **rps** [**all** \| **detail** \| **switch** [*switch-number*]] keywords were added. |

## Usage Guidelines

Use the **session** privileged EXEC command to access information from a specific switch other than the master.

Use the **show env stack** [*switch-number*] command to display information about any switch in the stack from any member switch.

Use with the **stack** keyword to show all information for the stack or for a specified switch in the stack.

Though visible on all switches, the **show env temperature status** command is valid only for the Catalyst 3750G-48TS, 3750G-48PS, 3750G-24TS-1U, and 3750G-24PS switches. If you enter this command on these switches, the command output shows the switch temperature states and the threshold levels. If you enter the command on a switch other than these four switches, the output field shows *Not Applicable*.

On a Catalyst 3750G-48PS or 3750G-24PS switch, you can also use the **show env temperature** command to display the switch temperature status. The command output shows the green and yellow states as *OK* and the red state as *FAULTY*. If you enter the **show env all** command on this switch, the command output is the same as the **show env temperature status** command output.

For more information about the threshold levels, see the software configuration guide for this release.

## Examples

This is an example of output from the **show env all** command entered from the master switch or a standalone switch:

```
Switch# show env all
FAN is OK
TEMPERATURE is OK
Temperature Value: 33 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 56 Degree Celsius
Red Threshold    : 66 Degree Celsius
SW  PID                 Serial#     Status           Sys Pwr  PoE Pwr  Watts
--  ------------------  ----------  ---------------  -------  -------  -----
 1  Built-in                                         Good

SW  Status          RPS Name          RPS Serial#  RPS Port#
--  -------------   ----------------  -----------  ---------
```

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

```
Switch# show env fan
FAN is OK
```

This is an example of output from the **show env rps** command on a stack master:

```
Switch# show env rps
SW  Status          RPS Name          RPS Serial#  RPS Port#
--  -------------   ----------------  -----------  ---------
3   Active          CiscoRPS          CAT1050VGF3  3

RPS Name: CiscoRPS
  State: Active
  PID: PWR-RPS2300
  Serial#: CAT1050VGF3
  Fan: Good
  Temperature: Green

  RPS Power Supply A: Present
    PID             : C3K-PWR-750WAC
    Serial#         : DTH1050M04S
    System Power    : Good
    PoE Power       : Good
    Watts           : 300/420 (System/PoE)
```

```
  RPS Power Supply B: Present
    PID             : C3K-PWR-750WAC
    Serial#         : DTH1050M03H
    System Power    : Good
    PoE Power       : Good
    Watts           : 300/420 (System/PoE)

DCOut  State   Connected  Priority  BackingUp  WillBackup  Portname         SW#
-----  ------- ---------  --------  ---------  ----------  ---------------  ---
    1  Active  Yes               6  Yes        Yes         <>                 -
    2  Active  Yes               6  Yes        Yes         <>                 -
    3  Active  Yes               3  No         Yes         Switch             3
    4  Active  No                1  No         Yes         <>                 -
    5  Active  No                6  No         No          <>                 -
    6  Active  No                6  No         No          <>                 -
```

This is an example of output from the **show env rps all** command on a stack master:

```
Switch# show env rps all
SWITCH 1:
RPS:
    RPS is active
    Fan:           Good
    Temperature:   Green

DC port legends:
Y   = Yes                      :  N   = No
Act = Active                   :  Sby = Standby
OK  = Power Supply is good     :  NP  = Power Supply is not present or bad
BU  = RPS actively backing up  :  NB  = RPS not actively backing up
12v/PoE  12v/PoE   RPS
Port  State  Prio   Status   Backup   Avail  PortName          Switch Name
----  -----  ----   ------   ------   -----  ---------------   ---------------
 1     Act     1    OK/OK    NB/NB      Y    <>                <remote>
 2     Act     4    OK/NP    NB/NB      Y    <>                <remote>
 3     Act     1    OK/OK    NB/NB      Y    <>                Switch
 4     Act     1    OK/OK    NB/NB      Y    Switch            <remote>
 5     Act     2    OK/OK    NB/NB      Y    <>                <remote>
 6     Act     6    OK/OK    NB/NB      Y    <>                <remote>

<output truncated>
```

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

```
Switch# show env stack
SWITCH: 1
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is NOT PRESENT
SWITCH: 2
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is NOT PRESENT
SWITCH: 3
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is NOT PRESENT
```

This example shows how to display information about stack member 3 from the master switch:

```
Switch# show env stack 3
SWITCH: 3
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is NOT PRESENT
```

This example shows how to display the temperature value, state, and the threshold values. Table 2-33 describes the temperature states in the command output.

```
Switch# show env temperature status
Temperature Value:28 Degree Celsius
Temperature State:GREEN
Yellow Threshold :70 Degree Celsius
Red Threshold    :75 Degree Celsius
```

***Table 2-33 States in the show env temperature status Command Output***

| State | Description |
|---|---|
| Green | The switch temperature is in the *normal* operating range. |
| Yellow | The temperature is in the *warning* range. You should check the external temperature around the switch. |
| Red | The temperature is in the *critical* range. The switch might not run properly if the temperature is in this range. |

# show errdisable detect

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

**show errdisable detect**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(37)SE | A mode column was added to the **show errdisable detect** output. |

## Usage Guidelines

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

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

You can configure error-disabled detection in these modes:

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

## Examples

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

```
Switch# show errdisable detect
ErrDisable Reason    Detection    Mode
-----------------    ---------    ----
arp-inspection       Enabled      port
bpduguard            Enabled      vlan
channel-misconfig    Enabled      port
community-limit      Enabled      port
dhcp-rate-limit      Enabled      port
dtp-flap             Enabled      port
gbic-invalid         Enabled      port
inline-power         Enabled      port
invalid-policy       Enabled      port
l2ptguard            Enabled      port
link-flap            Enabled      port
loopback             Enabled      port
lsgroup              Enabled      port
pagp-flap            Enabled      port
psecure-violation    Enabled      port/vlan
security-violatio    Enabled      port
sfp-config-mismat    Enabled      port
```

```
storm-control          Enabled      port
udld                   Enabled      port
vmps                   Enabled      port
```

## Related Commands

| Command | Description |
|---|---|
| **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** command in EXEC mode to display conditions that cause an error to be recognized for a cause.

**show errdisable flap-values**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | 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
```

## 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** command in EXEC mode to display the error-disabled recovery timer information.

**show errdisable recovery**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

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

## 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
l2ptguard            Disabled
psecure-violation    Disabled
gbic-invalid         Disabled
dhcp-rate-limit      Disabled
unicast-flood        Disabled
storm-control        Disabled
arp-inspection       Disabled
loopback             Disabled

Timer interval:300 seconds

Interfaces that will be enabled at the next timeout:

Interface    Errdisable reason    Time left(sec)
---------    -----------------    --------------
Gi1/0/2      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** command in EXEC mode 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**}

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **protocol** keyword was added. |
| 12.2(25)SE | The *channel-group-number* range was changed from 1 to 12 to 1 to 48. |

## Usage Guidelines

If you do not specify a *channel-group*, all channel groups are displayed.

In the output, the Passive port list field is displayed only for Layer 3 port channels. This field means that the physical port, which is still not up, is configured to be in the channel group (and indirectly is in the only port channel in the channel group).

## 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: Gi1/0/1
------------

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
Gi1/0/1   SA      bndl      32768         0x1       0x1     0x101    0x3D
Gi1/0/2   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     Gi1/0/1  Active          0
  0     00     Gi1/0/2  Active          0

Time since last port bundled:    01d:20h:20m:20s    Gi1/0/2
```

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      Gi1/0/1(P)  Gi1/0/2(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     Gi1/0/1  Active          0
  0     00     Gi1/0/2  Active          0

Time since last port bundled:    01d:20h:24m:44s    Gi1/0/2
```

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

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

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

## Related Commands

| Command | Description |
|---|---|
| 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 fallback profile

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

**show fallback profile**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(35)SE | This command was introduced. |

## Usage Guidelines

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

## Examples

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

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

## Related Commands

| Command | Description |
|---|---|
| **dot1x fallback profile** | Configure a port to use web authentication as a fallback method for clients that do not support IEEE 802.1x authentication. |
| **fallback profile profile** | Create a web authentication fallback profile. |
| **ip admission rule** | Enable web authentication on a switch port |
| **ip admission name proxy http** | Enable web authentication globally on a switch |
| **show dot1x** [**interface** *interface-id*] | Displays IEEE 802.1x status for the specified port. |

# show flowcontrol

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

**show flowcontrol** [**interface** *interface-id* | **module** *number*]

## 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 specified stack member switch. The range is 1 to 9. This option is not available if you have entered a specific interface ID. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(14)EA1 | 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. For a standalone switch, 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.

## 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
---------  -------- -------- -------- --------    ------- -------
Gi2/0/1    Unsupp.  Unsupp.  off      off         0       0
Gi2/0/2    desired  off      off      off         0       0
Gi2/0/3    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 gigabitethernet2/0/2
Port       Send FlowControl  Receive FlowControl  RxPause TxPause
           admin    oper     admin    oper
---------  -------- -------- -------- --------    ------- -------
Gi2/0/2    desired  off      off      off         0       0
```

**Related Commands**

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

# show idprom

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

**show idprom** {**interface** *interface-id*} [**detail**]

## Syntax Description

| | |
|---|---|
| **interface** *interface-id* | Display the IDPROM information for the specified 10-Gigabit Ethernet interface. |
| **detail** | (Optional) Display detailed hexidecimal IDPROM information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(20)SE1 | This command was introduced. |

## Usage Guidelines

This command applies only to 10-Gigabit Ethernet interfaces.

## Examples

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

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

http://www.xenpak.org/MSA/XENPAK_MSA_R2.1.pdf

http://www.xenpak.org/MSA/XENPAK_MSA_R3.0.pdf

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

```
Switch# show idprom interface tengigabitethernet1/0/1
TenGigabitEthernet1/0/1 (gpn:472, port-number:1)
----------------------------------------------------------
XENPAK Serial EEPROM Contents:
Non-Volatile Register (NVR) Fields
 XENPAK MSA Version supported         :0x15
 NVR Size in bytes                    :0x100
 Number of bytes used                 :0xD0
 Basic Field Address                  :0xB
 Customer Field Address               :0x77
 Vendor Field Address                 :0xA7
 Extended Vendor Field Address        :0x100
 Reserved                             :0x0
 Transceiver type                     :0x1 =XENPAK
 Optical connector type               :0x1 =SC
 Bit encoding                         :0x1 =NRZ
 Normal BitRate in multiple of 1M b/s :0x2848
```

```
 Protocol Type                           :0x1 =10GgE

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

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

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

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

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

## Related Commands

| Command | Description |
|---|---|
| **show controllers ethernet-controller** | Displays per-interface send and receive statistics read from the hardware, interface internal registers, or port ASIC information. |

# show interfaces

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

**show interfaces** [*interface-id* | **vlan** *vlan-id*] [**accounting** | **capabilities** [**module** *number*] | **counters** | **description** | **etherchannel** | **flowcontrol** | **private-vlan mapping** | **pruning** | **stats** | **status** [**err-disabled**] | **switchport** [**backup** | **module** *number*] | **transceiver** {**tengigabitethernet** *interface-id*} | **properties** | **detail** [**module** *number*] | **trunk**]

## Syntax Description

| | |
|---|---|
| *interface-id* | (Optional) Valid interfaces include physical ports (including type, stack member, 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* | **Note** (Optional) Display **capabilities**, **switchport** configuration, or **transceiver** characteristics (depending on preceding keyword) of all interfaces on the specified stack member. The range is 1 to 9. This option is not available if you enter 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 |
| **private-vlan mapping** | (Optional) Display private-VLAN mapping information for the VLAN switch virtual interfaces (SVIs). This keyword is available only if your switch is running the IP services image, formerly known as the enhanced multilayer image (EMI). |
| **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 (nonrouting) 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 stack. |
| **tengigabitethernet** | Display the status of a connected ten-gigabit module. |

| | |
|---|---|
| **transceiver** [**detail** \| **properties**] | (Optional) Display the physical properties of a CWDM or DWDM 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, duplex, and inline power settings on an interface. |
| **trunk** | Display interface trunk information. If you do not specify an interface, only information for active trunking ports appears. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | Support for the **capabilities** keyword was added. |
| 12.2(20)SE | The **private-vlan mapping**, **backup**, **transceiver calibration**, **detail**, and **properties**, keywords were added. |
| 12.2(25)SEA | The **calibration** keyword was removed. |
| 12.2(25)SEE | The **backup**, **counters**, **detail**, and **trunk** keywords were added. |
| 12.2(44)SE | Added the **tengigabitethernet** *interface-id* **transceiver detail** keywords. |

## Usage Guidelines

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

- Use the **show interfaces capabilities module** *number* command to display the capabilities of all interfaces on that switch in the stack. If there is no switch with that module number in the stack, there is no output.
- 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 in the stack.

**Note** Use the **show interfaces switchport module** *number* command to display the switch port characteristics of all interfaces on that switch in the stack. If there is no switch with that module number in the stack, there is no outputThough 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.

## Examples

This is an example of output from the **show interfaces** command for an interface on stack member 3:

```
Switch# show interfaces gigabitethernet3/0/2
GigabitEthernet3/0/2 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 interfaces" 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.

GigabitEthernet1/0/1
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
No traffic sent or received on this interface.
GigabitEthernet1/0/2
                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 gigabitethernet1/0/2 capabilities
GigabitEthernet1/0/2
  Model:                 WS-C3750G-24TS
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
  Multiple Media Types:   rj45, sfp, auto-select
```

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 gigabitethernet1/0/2 description
Interface Status         Protocol Description
Gi1/0/2     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 private-vlan mapping** command when the private-VLAN primary VLAN is VLAN 10 and the secondary VLANs are VLANs 501 and 502:

```
Switch# show interfaces private-vlan mapping
Interface Secondary VLAN Type
--------- -------------- -----------------
vlan10    501            isolated
vlan10    502            community
```

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 gigibitethernet1/0/2 pruning
Port    Vlans pruned for lack of request by neighbor
Gi1/0/2   3,4

Port    Vlans traffic requested of neighbor
Gi1/0/2   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
1/0/1                     connected    routed     a-half  a-100 10/100BaseTX
Fa1/0/2                     notconnect   121,40       auto   auto 10/100BaseTX
Fa1/0/3                     notconnect   1            auto   auto 10/100BaseTX
Fa1/0/4                     notconnect   18           auto   auto Not Present
Fa1/0/5                     connected    121        a-full a-1000 10/100BaseTX
Fa1/0/6                     connected    122,11     a-full a-1000 10/100BaseTX

<output truncated>
Gi1/0/1                     notconnect   1            auto   auto 10/100/1000BaseTX
Gi1/0/2                     notconnect   1            auto   auto unsupported
```

These are examples of output from the **show interfaces status** command for a specific interface when private VLANs are configured. Port 2 is configured as a private-VLAN host port. It is associated with primary VLAN 20 and secondary VLAN 25.

```
Switch# show interfaces fastethernet1/0/2 status
Port      Name               Status       Vlan       Duplex  Speed Type
Fa1/0/2                     connected    20,25      a-full  a-100 10/100BaseTX
```

In this example, port 3 is configured as a private-VLAN promiscuous port. The display shows only the primary VLAN 20.

```
Switch# show interfaces fastethernet1/0/3 status
Port      Name               Status       Vlan       Duplex  Speed Type
Fa1/0/3                     connected    20         a-full  a-100 10/100BaseTX
```

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
Gi2/0/26                    err-disabled gbic-invalid
```

This is an example of output from the **show interfaces switchport** command for a port. Table 2-34 describes the fields in the display.

**Note** Private VLAN trunks are not supported in this release, so those fields are not applicable.

```
Switch# show interfaces gigabitethernet1/0/1 switchport
Name: Gi1/0/1
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 2-34 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. |
| Administrative private-vlan host-association | Displays the administrative VLAN association for private-VLAN host ports. |
| Administrative private-vlan mapping | Displays the administrative VLAN mapping for private-VLAN promiscuous ports. |
| Operational private-vlan | Displays the operational private-VLAN status. |
| Appliance trust | Displays the class of service (CoS) setting of the data packets of the IP phone. |

This is an example of output from the **show interfaces switchport** command for a port configured as a private VLAN promiscuous port. The primary VLAN 20 is mapped to secondary VLANs 25, 30, and 35:

```
Switch# show interfaces gigabitethernet1/0/2 switchport
Name: Gi1/01/2
Switchport: Enabled
Administrative Mode: private-vlan promiscuous
Operational Mode: private-vlan promiscuous
```

```
Administrative Trunking Encapsulation: negotiate
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: 20 (VLAN0020) 25 (VLAN0025) 30 (VLAN0030) 35
(VLAN0035)
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk Native VLAN tagging: enabled
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan:
20 (VLAN0020) 25 (VLAN0025)
30 (VLAN0030)
35 (VLAN0035)

<output truncated>
```

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
     ------------------------------------------------------------
     Fa1/0/1               Fa1/0/2             Active Up/Backup Standby
     Fa3/0/3               Fa4/0/5             Active Down/Backup Up
     Po1                       Po2                 Active Standby/Backup Up
```

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

```
Switch(config)#interface gigabitEthernet 2/0/6
Switch(config-if)#switchport backup interface gigabitEthernet 2/0/8 prefer vlan 60,100-120
```

When both interfaces are up, Gi2/0/8 forwards traffic for VLANs 60, 100 to 120, and Gi2/0/6 forwards traffic for VLANs 1 to 50.

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

Active Interface        Backup Interface        State
------------------------------------------------------------------------
GigabitEthernet2/0/6 GigabitEthernet2/0/8 Active Down/Backup Up

Vlans on Interface Gi 2/0/6: 1-50
Vlans on Interface Gi 2/0/8: 60, 100-120
```

When a Flex Link interface goes down (LINK_DOWN), VLANs preferred on this interface are moved to the peer interface of the Flex Link pair. In this example, if interface Gi2/0/6 goes down, Gi2/0/8 carries all VLANs of the Flex Link pair.

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

Active Interface        Backup Interface        State
------------------------------------------------------------------------
GigabitEthernet2/0/6 GigabitEthernet2/0/8 Active Down/Backup Up

Vlans on Interface Gi 2/0/6:
Vlans on Interface Gi 2/0/8: 1-50, 60, 100-120
```

When a Flex Link interface comes up, VLANs preferred on this interface are blocked on the peer interface and moved to the forwarding state on the interface that has just come up. In this example, if interface Gi2/0/6 comes up, then VLANs preferred on this interface are blocked on the peer interface Gi2/0/8 and forwarded on Gi2/0/6.

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

Active Interface        Backup Interface        State
------------------------------------------------------------------------
GigabitEthernet2/0/6 GigabitEthernet2/0/8 Active Down/Backup Up

Vlans on Interface Gi 2/0/6: 1-50
Vlans on Interface Gi 2/0/8: 60, 100-120
```

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

```
Switch# show interfaces gigibitethernet1/0/2 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 gigabitethernet1/0/2 trunk
Port          Mode         Encapsulation  Status        Native vlan
Gi1/0/1      auto         negotiate      trunking      1

Port          Vlans allowed on trunk
Gi1/0/1      1-4094

Port          Vlans allowed and active in management domain
Gi1/0/1      1-4

Port          Vlans in spanning tree forwarding state and not pruned
Gi1/0/1       1-4
```

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

```
Switch# show interfaces gigabitethernet1/0/2 transceiver properties
Name : Gi1/0/2
Administrative Speed: auto
Operational Speed: auto
Administrative Duplex: auto
Administrative Power Inline: enable
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 gigabitethernet2/0/3 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)
------- ------------------  ----------  ---------  ---------  ---------
Gi2/0/3 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)
--------  --------------  ----------  ---------  ---------  ---------
Gi2/0/3   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)
--------  --------------  ----------  ---------  ---------  ---------
Gi2/0/3   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)
--------  --------------  ----------  ---------  ---------  ---------
Gi2/0/3   -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)
--------  --------------  ----------  ---------  ---------  ---------
Gi2/0/3   N/A  ( -0.0) --  -0.0        -0.0       -0.0       -0.0
```

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

```
Switch# show interfaces tengigabitethernet1/0/1 transceiver detail
Transceiver monitoring is disabled for all interfaces.

ITU Channel not available (Wavelength not available),
Transceiver is internally calibrated.
mA: milliamperes, dBm: decibels (milliwatts), NA or 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 calibrated.
High Alarm High Warn Low Warn Low Alarm
Temperature Threshold Threshold Threshold Threshold
Port (Celsius) (Celsius) (Celsius) (Celsius) (Celsius)
--------- ------------------ ---------- --------- --------- ---------
Te1/0/1 26.8 70.0 60.0 5.0 0.0
High Alarm High Warn Low Warn Low Alarm
Voltage Threshold Threshold Threshold Threshold
Port (Volts) (Volts) (Volts) (Volts) (Volts)
--------- --------------- ---------- --------- --------- ---------
Te1/0/1 3.15 3.63 3.63 2.97 2.97
High Alarm High Warn Low Warn Low Alarm
Current Threshold Threshold Threshold Threshold
Port (milliamperes) (mA) (mA) (mA) (mA)
--------- ----------------- ---------- --------- --------- ---------
Te1/0/1 5.0 16.3 15.3 3.9 3.2
Optical High Alarm High Warn Low Warn Low Alarm
Transmit Power Threshold Threshold Threshold Threshold
Port (dBm) (dBm) (dBm) (dBm) (dBm)
--------- ----------------- ---------- --------- --------- ---------
Te1/0/1 -1.9 1.0 0.5 -8.2 -8.5
Optical High Alarm High Warn Low Warn Low Alarm
Receive Power Threshold Threshold Threshold Threshold
Port (dBm) (dBm) (dBm) (dBm) (dBm)
------- ----------------- ---------- --------- --------- ---------
Te1/0/1 -1.4 1.0 0.5 -14.1 -15.0
```

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

```
Switch# show interfaces tengigabitethernet1/0/1 transceiver properties
Transceiver monitoring is disabled for all interfaces.

ITU Channel not available (Wavelength not available),
Transceiver is internally calibrated.
Name : Te1/0/1
Administrative Speed: 10000
Administrative Duplex: full
Administrative Auto-MDIX: on
Administrative Power Inline: N/A
Operational Speed: 10000
Operational Duplex: full
Operational Auto-MDIX: off
Media Type: 10GBase-LR
```

## 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 mode private-vlan** | Configures a port as a private-VLAN host or a promiscuous port. |
| **switchport private-vlan** | Defines private-VLAN association for a host port or private-VLAN mapping for a promiscuous 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** | **module** *switch-number* | **protocol status** | **trunk**]

## Syntax Description

| | |
|---|---|
| *interface-id* | (Optional) ID of the physical interface |
| **errors** | (Optional) Display error counters. |
| **etherchannel** | (Optional) Display EtherChannel counters, including octets, broadcast packets, multicast packets, and unicast packets received and sent. |
| **module** *switch- number* | (Optional) Display counters for the specified stack member. The range is from 1 to 9, depending upon the switch numbers in the stack.<br>**Note** The **module** keyword in this command refers to the stack member number (1 to 9). The module number that is part of the interface ID is always zero. |
| **protocol status** | (Optional) Display status of protocols enabled on interfaces. |
| **trunk** | (Optional) Display trunk counters. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(25)SE | The **etherchannel** and **protocol status** keywords were added. The **broadcast**, **multicast**, and **unicast** keywords were removed. |

## Usage Guidelines

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

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

## 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
Gi1/0/1                0             0             0             0
Gi1/0/2                0             0             0             0

<output truncated>
```

This is an example of partial output from the **show interfaces counters module** command for stack member 2. It displays all counters for the specified switch in the stack.

```
Switch# show interfaces counters module 2
Port            InOctets   InUcastPkts   InMcastPkts   InBcastPkts
Fa2/0/1              520             2             0             0
Fa2/0/2              520             2             0             0
Fa2/0/3              520             2             0             0
Fa2/0/4              520             2             0             0
Fa2/0/5              520             2             0             0
Fa2/0/6              520             2             0             0
Fa2/0/7              520             2             0             0
Fa2/0/8              520             2             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
 Vlan20: Other, IP, ARP
 Vlan30: Other, IP, ARP
 Vlan40: Other, IP, ARP
 Vlan50: Other, IP, ARP
 Vlan60: Other, IP, ARP
 Vlan70: Other, IP, ARP
 Vlan80: Other, IP, ARP
 Vlan90: Other, IP, ARP
 Vlan900: Other, IP, ARP
 Vlan3000: Other, IP
 Vlan3500: Other, IP
 FastEthernet1/0/1: Other, IP, ARP, CDP
 FastEthernet1/0/2: Other, IP
 FastEthernet1/0/3: Other, IP
 FastEthernet1/0/4: Other, IP
 FastEthernet1/0/5: Other, IP
 FastEthernet1/0/6: Other, IP
 FastEthernet1/0/7: Other, IP
 FastEthernet1/0/8: Other, IP
 FastEthernet1/0/9: Other, IP
 FastEthernet1/0/10: Other, IP, CDP

<output truncated>
```

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

```
Switch# show interfaces counters trunk
Port        TrunkFramesTx  TrunkFramesRx  WrongEncap
Gi1/0/1                 0              0           0
Gi1/0/2                 0              0           0
Gi1/0/3             80678           4155           0
Gi1/0/4             82320            126           0
Gi1/0/5                 0              0           0

<output truncated>
```

## Related Commands

| Command | Description |
|---|---|
| **show interfaces** | Displays additional interface characteristics. |

# show inventory

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

**show inventory** [*entity-name* | **raw**]

## Syntax Description

| | |
|---|---|
| *entity-name* | (Optional) Display the specified entity. For example, enter the interface (such as gigabitethernet1/0/1) into which a small form-factor pluggable (SFP) module is installed. |
| **raw** | (Optional) Display every entity in the device. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(25)SEC | 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.

## Examples

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

```
Switch# show inventory
NAME: "5", DESCR: "WS-C3750G-12S"
PID: WS-C3750G-12S-S   , VID: E0 , SN: CAT0749R204
```

# show ip arp inspection

Use the **show ip arp inspection** privileged EXEC command to display the configuration and the operating state of dynamic Address Resolution Protocol (ARP) inspection or the status of this feature for all VLANs or for the specified interface or VLAN.

**show ip arp inspection** [**interfaces** [*interface-id*] | **log** | **statistics** [**vlan** *vlan-range*] | **vlan** *vlan-range*]

## Syntax Description

| | |
|---|---|
| **interfaces** [*interface-id*] | (Optional) Display the trust state and the rate limit of ARP packets for the specified interface or all interfaces. Valid interfaces include physical ports and port channels. |
| **log** | (Optional) Display the configuration and contents of the dynamic ARP inspection log buffer. |
| **statistics** [**vlan** *vlan-range*] | (Optional) Display statistics for forwarded, dropped, MAC validation failure, IP validation failure, access control list (ACL) permitted and denied, and DHCP permitted and denied packets for the specified VLAN. If no VLANs are specified or if a range is specified, display information only for VLANs with dynamic ARP inspection enabled (active).<br><br>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. |
| **vlan** *vlan-range* | (Optional) Display the configuration and the operating state of dynamic ARP inspection for the specified VLAN. If no VLANs are specified or if a range is specified, display information only for VLANs with dynamic ARP inspection enabled (active).<br><br>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. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(20)SE | This command was introduced. |
| 12.2(37)SE | The output changed to include Probe Logging information. |

## Examples

This is an example of output from the **show ip arp inspection** command

```
Switch# show ip arp inspection

Source Mac Validation      : Disabled
Destination Mac Validation : Disabled
IP Address Validation      : Enabled
```

```
 Vlan     Configuration    Operation   ACL Match          Static ACL
 ----     -------------    ---------   ---------          ----------
    1     Enabled          Active      deny-all           No

 Vlan     ACL Logging      DHCP Logging      Probe Logging
 ----     -----------      ------------      -------------
    1     Acl-Match        All               Permit

 Vlan      Forwarded        Dropped     DHCP Drops      ACL Drops
 ----      ---------        -------     ----------      ---------
    1              0              0              0              0

 Vlan   DHCP Permits    ACL Permits  Probe Permits   Source MAC Failures
 ----   ------------    -----------  -------------   -------------------
    1              0              0              0                     0

 Vlan   Dest MAC Failures   IP Validation Failures   Invalid Protocol Data
 ----   -----------------   ----------------------   ---------------------
    1                   0                        0                      0
```

This is an example of output from the **show ip arp inspection interfaces** command:

```
Switch# show ip arp inspection interfaces
 Interface        Trust State     Rate (pps)    Burst Interval
 ---------------  -----------     ----------    --------------
 Gi1/0/1            Untrusted              15                 1
 Gi1/0/2            Untrusted              15                 1
 Gi1/0/3            Untrusted              15                 1
```

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

```
Switch# show ip arp inspection interfaces gigabitethernet1/0/1
 Interface        Trust State     Rate (pps)    Burst Interval
 ---------------  -----------     ----------    --------------
 Gi1/0/1            Untrusted              15                 1
```

This is an example of output from the **show ip arp inspection log** command. It shows the contents of the log buffer before the buffers are cleared:

```
Switch# show ip arp inspection log
Total Log Buffer Size : 32
Syslog rate : 10 entries per 300 seconds.

Interface   Vlan  Sender MAC      Sender IP        Num Pkts   Reason       Time
----------  ----  --------------  ---------------  ---------  -----------  ----
Gi1/0/1       5     0003.0000.d673  192.2.10.4               5  DHCP Deny    19:39:01 UTC
Mon Mar 1 1993
Gi1/0/1       5     0001.0000.d774  128.1.9.25               6  DHCP Deny    19:39:02 UTC
Mon Mar 1 1993
Gi1/0/1       5     0001.c940.1111  10.10.10.1               7  DHCP Deny    19:39:03 UTC
Mon Mar 1 1993
Gi1/0/1       5     0001.c940.1112  10.10.10.2               8  DHCP Deny    19:39:04 UTC
Mon Mar 1 1993
Gi1/0/1       5     0001.c940.1114  173.1.1.1               10  DHCP Deny    19:39:06 UTC
Mon Mar 1 1993
Gi1/0/1       5     0001.c940.1115  173.1.1.2               11  DHCP Deny    19:39:07 UTC
Mon Mar 1 1993
Gi1/0/1       5     0001.c940.1116  173.1.1.3               12  DHCP Deny    19:39:08 UTC
Mon Mar 1 1993
```

If the log buffer overflows, it means that a log event does not fit into the log buffer, and the display for the **show ip arp inspection log** privileged EXEC command is affected. A -- in the display appears in place of all data except the packet count and the time. No other statistics are provided for the entry. If you see this entry in the display, increase the number of entries in the log buffer, or increase the logging rate in the **ip arp inspection log-buffer** global configuration command.

This is an example of output from the **show ip arp inspection statistics** command. It shows the statistics for packets that have been processed by dynamic ARP inspection for all active VLANs.

```
Switch# show ip arp inspection statistics
Vlan       Forwarded        Dropped     DHCP Drops      ACL Drops
 ----      ---------        -------     ----------      ---------
    5              3           4618           4605              4
 2000              0              0              0              0

 Vlan   DHCP Permits    ACL Permits   Source MAC Failures
 ----   ------------    -----------   -------------------
    5              0             12                     0
 2000              0              0                     0

 Vlan   Dest MAC Failures   IP Validation Failures
 ----   -----------------   ----------------------
    5                   0                       9
 2000                   0                       0
```

For the **show ip arp inspection statistics** command, the switch increments the number of forwarded packets for each ARP request and response packet on a trusted dynamic ARP inspection port. The switch increments the number of ACL or DHCP permitted packets for each packet that is denied by source MAC, destination MAC, or IP validation checks, and the switch increments the appropriate failure count.

This is an example of output from the **show ip arp inspection statistics vlan 5** command. It shows statistics for packets that have been processed by dynamic ARP for VLAN 5.

```
Switch# show ip arp inspection statistics vlan 5
Vlan      Forwarded        Dropped     DHCP Drops      ACL Drops
 ----      ---------        -------     ----------      ---------
    5              3           4618           4605              4

 Vlan   DHCP Permits    ACL Permits   Source MAC Failures
 ----   ------------    -----------   -------------------
    5              0             12                     0

 Vlan   Dest MAC Failures   IP Validation Failures      Invalid Protocol Data
 ----   -----------------   ----------------------      ---------------------
    5                   0                       9                          3
```

This is an example of output from the **show ip arp inspection vlan 5** command. It shows the configuration and the operating state of dynamic ARP inspection for VLAN 5.

```
Switch# show ip arp inspection vlan 5
Source Mac Validation      :Enabled
Destination Mac Validation :Enabled
IP Address Validation      :Enabled

 Vlan     Configuration    Operation   ACL Match          Static ACL
 ----     -------------    ---------   ---------          ----------
    5     Enabled          Active      second             No

 Vlan     ACL Logging      DHCP Logging
 ----     -----------      ------------
    5     Acl-Match        All
```

## Related Commands

| Command | Description |
|---|---|
| arp access-list | Defines an ARP ACL. |
| clear ip arp inspection log | Clears the dynamic ARP inspection log buffer. |
| clear ip arp inspection statistics | Clears the dynamic ARP inspection statistics. |
| ip arp inspection log-buffer | Configures the dynamic ARP inspection logging buffer. |
| ip arp inspection vlan logging | Controls the type of packets that are logged per VLAN. |
| show arp access-list | Displays detailed information about ARP access lists. |

# show ip dhcp snooping

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

**show ip dhcp snooping**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(19)EA1 | This command was introduced. |
| 12.2(25)SEE | The command output was updated to show the global suboption configuration. |

## Usage Guidelines

This command displays only the results of global configuration. Therefore, in this example, the circuit ID suboption appears in its default format of **vlan-mod-port**, even if a string is configured for the circuit ID.

## 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)
------------------------     -------     ----------------
GigabitEthernet1/0/1             yes         unlimited
GigabitEthernet1/0/2             yes         unlimited
GigabitEthernet2/0/3             no          2000
GigabitEthernet2/0/4             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** command in EXEC mode 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*]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(19)EA1 | This command was introduced. |
| 12.2(18)SE | The **dynamic** and **static** keywords were removed. |

## Usage Guidelines

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

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

## 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    GigabitEthernet2/0/1
00:D0:B7:1B:35:DE   10.1.2.151       237         dhcp-snooping  20    GigabitEthernet2/0/2
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    GigabitEthernet2/0/1
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    GigabitEthernet2/0/2
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 gigabitethernet2/0/2
MacAddress          IpAddress        Lease(sec)  Type           VLAN  Interface
------------------  ---------------  ----------  -------------  ----  --------------------
00:30:94:C2:EF:35   10.1.2.151       290         dhcp-snooping  20    GigabitEthernet2/0/2
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    GigabitEthernet2/0/1
00:00:00:00:00:02   10.1.2.151       65          dhcp-snooping  20    GigabitEthernet2/0/2
Total number of bindings: 2
```

Table 2-35 describes the fields in the **show ip dhcp snooping binding** command output:

***Table 2-35 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 |
|---|---|
| **ip dhcp snooping binding** | Configures the DHCP snooping binding database |
| **show ip dhcp snooping** | Displays the DHCP snooping configuration. |

# show ip dhcp snooping database

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

**show ip dhcp snooping database** [**detail**]

## Syntax Description

| | |
|---|---|
| **detail** | (Optional) Display detailed status and statistics information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Examples

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

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

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

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

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

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

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

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

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

Total Attempts       :       21   Startup Failures :        0
Successful Transfers :        0   Failed Transfers :       21
```

```
Successful Reads      :         0   Failed Reads      :         0
Successful Writes     :         0   Failed Writes     :        21
Media Failures        :         0

First successful access: Read

Last ignored bindings counters :
Binding Collisions    :         0   Expired leases    :         0
Invalid interfaces    :         0   Unsupported vlans :         0
Parse failures        :         0
Last Ignored Time : None

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

## Related Commands

| Command | Description |
|---|---|
| ip dhcp snooping | Enables DHCP snooping on a VLAN. |
| ip dhcp snooping database | Configures the DHCP snooping binding database agent or the binding file. |
| show ip dhcp snooping | Displays DHCP snooping information. |

# show ip dhcp snooping statistics

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

**show ip dhcp snooping statistics** [**detail**]

## Syntax Description

| | |
|---|---|
| **detail** | (Optional) Display detailed statistics information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(37)SE | This command was introduced. |

## Usage Guidelines

In a switch stack, all statistics are generated on the stack master. If a new stack master is elected, the statistics counters reset.

## Examples

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

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

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

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

Table 2-36 shows the DHCP snooping statistics and their descriptions:

*Table 2-36 DHCP Snooping Statistics*

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

*Table 2-36 DHCP Snooping Statistics (continued)*

| DHCP Snooping Statistic | Description |
|---|---|
| Reply output port equal to input port | Number of times the output port for a DHCP reply packet is the same as the input port, causing a possible loop. Indicates a possible network misconfiguration or misuse of trust settings on ports. |
| Packet denied by platform | Number of times the packet has been denied by a platform-specific registry. |

**Related Commands**

| Command | Description |
|---|---|
| clear ip dhcp snooping | Clears the DHCP snooping binding database, the DHCP snooping binding database agent statistics, or the DHCP snooping statistics counters. |

# show ip igmp profile

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

**show ip igmp profile** [*profile number*]

## 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. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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** command in EXEC mode 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*]

## 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). |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **querier** keyword was added. |
| 12.2(18)SE | The **groups** keyword was added. The **show ip igmp snooping groups** command replaced the **show ip igmp snooping multicast** command. |

## 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.

## 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 : 100

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

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

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

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

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

<output truncated>
```

## Related Commands

| Command | Description |
|---|---|
| **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**] [**user**] [**vlan** *vlan-id* [*ip_address*]]

## 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. |
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094. |
| *ip_address* | (Optional) Display characteristics of the multicast group with the specified group IP address. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(18)SE | This command was introduced. It replaced the **show ip igmp snooping multicast** command. |

## 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.

## 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
------------------------------------------------------------
1         224.1.4.4       igmp                    Fa1/0/11
1         224.1.4.5       igmp                    Fa1/0/11
2         224.0.1.40      igmp        v2          Fa1/0/15
```

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          Gi2/0/1, 1/0/15
104       224.1.4.3       igmp        v2          Gi2/0/1, 1/0/15
```

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          Gi2/0/1, 1/0/15
```

## 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*]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | 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.

## 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    Gi2/0/1(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** command in EXEC mode 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**]]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(25)SEA | 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** 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

## 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
--------------------------------------------------
1         172.20.50.11   v3                  Gi1/0/1
2         172.20.40.20   v2                  Router
```

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

```
Switch# show ip igmp snooping querier detail

Vlan      IP Address      IGMP Version    Port
-----------------------------------------------------------
1         1.1.1.1         v2              Fa8/0/1

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 Fa8/0/1
-----------------------------------------------------------
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 ip source binding

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

**show ip source binding** [*ip-address*] [*mac-address*] [**dhcp-snooping** | **static**] [**interface** *interface-id*] [**vlan** *vlan-id*]

## Syntax Description

| | |
|---|---|
| *ip-address* | (Optional) Display IP source bindings for a specific IP address. |
| *mac-address* | (Optional) Display IP source bindings for a specific MAC address. |
| **dhcp-snooping** | (Optional) Display IP source bindings that were learned by DHCP snooping. |
| **static** | (Optional) Display static IP source bindings. |
| **interface** *interface-id* | (Optional) Display IP source bindings on a specific interface. |
| **vlan** *vlan-id* | (Optional) Display IP source bindings on a specific VLAN. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

The **show ip source binding** command output shows the dynamically and statically configured bindings in the DHCP snooping binding database.

Use the **show ip dhcp snooping binding** privileged EXEC command to display only the dynamically configured bindings.

## Examples

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

```
Switch# show ip source binding
MacAddress          IpAddress        Lease(sec)  Type           VLAN  Interface
--------------      ---------------  ----------  -------------  ----  --------------------
00:00:00:0A:00:0B   11.0.0.1         infinite    static         10    GigabitEthernet1/0/1
00:00:00:0A:00:0A   11.0.0.2         10000       dhcp-snooping  10    GigabitEthernet1/0/1
```

## Related Commands

| Command | Description |
|---|---|
| **ip dhcp snooping binding** | Configures the DHCP snooping binding database. |
| **ip source binding** | Configures static IP source bindings on the switch. |

# show ip verify source

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

**show ip verify source** [**interface** *interface-id*]

## Syntax Description

| | |
|---|---|
| **interface** *interface-id* | (Optional) Display IP source guard configuration on a specific interface. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Examples

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

```
Switch# show ip verify source
Interface  Filter-type  Filter-mode  IP-address       Mac-address     Vlan
---------  -----------  -----------  ---------------  --------------  ---------
gi1/0/1        ip           active       10.0.0.1                         10
gi1/0/1        ip           active       deny-all                         11-20
gi1/0/2        ip           inactive-trust-port
gi1/0/3        ip           inactive-no-snooping-vlan
gi1/0/4        ip-mac       active       10.0.0.2         aaaa.bbbb.cccc  10
gi1/0/4        ip-mac       active       deny-all         deny-all        12-20
gi1/0/4        ip-mac       active       11.0.0.1         aaaa.bbbb.cccd  11
gi1/0/4        ip-mac       active       deny-all         deny-all        12-20
gi1/0/5        ip-mac       active       10.0.0.3         permit-all      10
gi1/0/5        ip-mac       active       deny-all         permit-all      11-20
```

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

- On the Gigabit Ethernet 1 interface, DHCP snooping is enabled on VLANs 10 to 20. For VLAN 10, IP source guard with IP address filtering is configured on the interface, and a binding exists on the interface. For VLANs 11 to 20, the second entry shows that a default port access control lists (ACLs) is applied on the interface for the VLANs on which IP source guard is not configured.
- The Gigabit Ethernet 2 interface is configured as trusted for DHCP snooping.
- On the Gigabit Ethernet 3 interface, DHCP snooping is not enabled on the VLANs to which the interface belongs.
- On the Gigabit Ethernet 4 interface, IP source guard with source IP and MAC address filtering is enabled, and static IP source bindings are configured on VLANs 10 and 11. For VLANs 12 to 20, the default port ACL is applied on the interface for the VLANs on which IP source guard is not configured.
- On the Gigabit Ethernet 5 interface, IP source guard with source IP and MAC address filtering is enabled and configured with a static IP binding, but port security is disabled. The switch cannot filter source MAC addresses.

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

```
Switch# show ip verify source gigabitethernet1/0/6
IP source guard is not configured on the interface gi1/0/6.
```

## Related Commands

| Command | Description |
|---|---|
| ip verify source | Enables IP source guard on an interface. |

# show ipc

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

**show ipc** {**mcast** {**appclass** | **groups** | **status**} | **nodes** | **ports** [**open**] | **queue** | **rpc** | **session** {**all** | **rx** | **tx**} [**verbose**] | **status** [**cumlulative**] | **zones**}

## Syntax Description

| | |
|---|---|
| **mcast** {**appclass** \| **groups** \| **status**} | Display the IPC multicast routing information. The keywords have these meanings:<br>• **appclass**—Display the IPC multicast application classes.<br>• **groups**—Display the IPC multicast groups.<br>• **status**—Display the IPC multicast routing status. |
| **nodes** | Display participating nodes. |
| **ports** [**open**] | Display local IPC ports. The keyword has this meaning:<br>• **open**—(Optional) Display only the open ports. |
| **queue** | Display the contents of the IPC transmission queue. |
| **rpc** | Display the IPC remote-procedure statistics. |
| **session** {**all** \| **rx** \| **tx**} | Display the IPC session statistics (available only in privileged EXEC mode). The keywords have these meanings:<br>• **all**—Display all the session statistics.<br>• **rx**—Display the sessions statistics for traffic that the switch receives<br>• **tx**—Display the sessions statistics for traffic that the switch forwards. |
| **verbose** | (Optional) Display detailed statistics (available only in privileged EXEC mode). |
| **status** [**cumlulative**] | Display the status of the local IPC server. The keyword has this meaning:<br>• **cumlulative**—(Optional) Display the status of the local IPC server since the switch was started or restarted. |
| **zones** | Display the participating IPC zones. The switch supports a single IPC zone. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(18)SE | The **mcast** {**appclass** \| **groups** \| **status**}, **rpc**, **session** {**all** \| **rx** \| **tx**} [**verbose**], and **cumulative** keywords were added. |
| 12.2(25)SE | The **mcast**, **rpc**, and **session** keywords were added. |

## Examples

This example shows how to display the IPC routing status:

```
Switch# show ipc mcast status
                          IPC Mcast Status
                                                              Tx         Rx

 Total Frames                                                 0          0
 Total control Frames                                         0          0
 Total Frames dropped                                         0          0
 Total control Frames dropped                                 0          0

 Total Reliable messages                                      0          0
 Total Reliable messages acknowledged                         0          0
 Total Out of Band Messages                                   0          0
 Total Out of Band messages acknowledged                      0          0

 Total No Mcast groups                                        0          0

 Total Retries                     0  Total Timeouts                      0
 Total OOB Retries                 0  Total OOB Timeouts                  0
 Total flushes                     0  Total No ports                      0
```

This example shows how to display the participating nodes:

```
Switch# show ipc nodes
There is 1 node in this IPC realm.
   ID    Type       Name           Last  Last
                                   Sent  Heard
   10000 Local      IPC Master     0      0
```

This example shows how to display the local IPC ports:

```
Switch# show ipc ports
There are 8 ports defined.

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

   10000.8     unicast    Slot 1 :MDFS.control.RIL
     port_index = 0  seat_id = 0x10000    last sent = 0     last heard = 0
  0/0/0

RPC packets:current/peak/total
                                                                0/1/4
```

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

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

```
0  times message cache crossed       5000 [max]

Emergency messages currently in use           :         0

There are 2 messages currently reserved for reply msg.

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

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

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

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

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

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

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

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

 Time last IPC stat cleared :never

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

 1000 IPC Message Headers Cached.
                                                    Rx Side     Tx Side

 Total Frames                                         12916         608
     0          0
 Total from Local Ports                               13080         574
 Total Protocol Control Frames                          116          17
 Total Frames Dropped                                     0           0
                             Service Usage

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

## Related Commands

| Command | Description |
|---|---|
| clear ipc | Clears the IPC multicast routing statistics. |

# show ipv6 access-list

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

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

## Syntax Description

| | |
|---|---|
| *access-list-name* | (Optional) Name of access list. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

The **show ipv6 access-list** command provides output similar to the **show ip access-list** command, except that it is IPv6-specific.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6** global configuration command and reload the switch.

**Note** This command is available only if and you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Examples

The following output from the **show ipv6 access-list** command shows IPv6 access lists named inbound and outbound:

```
Switch# show ipv6 access-list
IPv6 access list inbound
    permit tcp any any eq bgp (8 matches) sequence 10
    permit tcp any any eq telnet (15 matches) sequence 20
    permit udp any any sequence 30
```

Table 2-37 describes the significant fields shown in the display.

***Table 2-37 show ipv6 access-list Field Descriptions***

| Field | Description |
|---|---|
| IPv6 access list inbound | Name of the IPv6 access list, for example, inbound. |
| permit | Permits any packet that matches the specified protocol type. |
| tcp | Transmission Control Protocol. The higher-level (Layer 4) protocol type that the packet must match. |
| any | Equal to ::/0. |

*Table 2-37 show ipv6 access-list Field Descriptions (continued)*

| Field | Description |
|---|---|
| eq | An equal operand that compares the source or destination ports of TCP or UDP packets. |
| bgp (matches) | Border Gateway Protocol. The protocol type that the packet is equal to and the number of matches. |
| sequence 10 | Sequence in which an incoming packet is compared to lines in an access list. Access list lines are ordered from first priority (lowest number, for example, 10) to last priority (highest number, for example, 80). |

## Related Commands

| Command | Description |
|---|---|
| **clear ipv6 access-list** | Resets the IPv6 access list match counters. |
| **ipv6 access-list** | Defines an IPv6 access list and puts the switch into IPv6 access-list configuration mode. |
| **sdm prefer** | Configures an SDM template to optimize system resources based on how the switch is being used. |

# show ipv6 dhcp conflict

Use the **show ipv6 dhcp conflict** privileged EXEC command to display address conflicts found by a Dynamic Host Configuration Protocol for IPv6 (DHCPv6) server when addresses are offered to the client.

**show ipv6 dhcp conflict**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(46)SE | This command was introduced. |

## Usage Guidelines

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6** global configuration command, and reload the switch.

When you configure the DHCPv6 server to detect conflicts, it uses ping. The client uses neighbor discovery to detect clients and reports to the server through a DECLINE message. If an address conflict is detected, the address is removed from the pool, and the address is not assigned until the administrator removes the address from the conflict list.

**Note** This command is available only if and you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Examples

This is an example of the output from the **show ipv6 dhcp conflict** command:

```
Switch# show ipv6 dhcp conflict
Pool 350, prefix 2001:1005::/48
        2001:1005::10
```

## Related Commands

| Command | Description |
|---|---|
| **ipv6 dhcp pool** | Configures a DHCPv6 pool and enters DHCPv6 pool configuration mode. |
| **clear ipv6 dhcp conflict** | Clears an address conflict from the DHCPv6 server database. |

# show ipv6 mld snooping

Use the **show ipv6 mld snooping** command in EXEC mode to display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping configuration of the switch or the VLAN.

**show ipv6 mld snooping** [**vlan** *vlan-id*]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

Use this command to display MLD snooping configuration for the switch or for a specific VLAN.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6** global configuration command and reload the switch.

**Note** This command is available only if you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Examples

This is an example of output from the **show ipv6 mld snooping vlan** command. It shows snooping characteristics for a specific VLAN.

```
Switch# show ipv6 mld snooping vlan 100
Global MLD Snooping configuration:
-------------------------------------------
MLD snooping                  : Enabled
MLDv2 snooping (minimal)      : Enabled
Listener message suppression  : Enabled
TCN solicit query             : Disabled
TCN flood query count         : 2
Robustness variable           : 3
Last listener query count     : 2
Last listener query interval  : 1000
Vlan 100:
--------
MLD snooping                        : Disabled
MLDv1 immediate leave               : Disabled
Explicit host tracking              : Enabled
Multicast router learning mode      : pim-dvmrp
Robustness variable                 : 3
Last listener query count           : 2
```

```
Last listener query interval        : 1000
```

This is an example of output from the **show ipv6 mld snooping** command. It displays snooping characteristics for all VLANs on the switch.

```
Switch# show ipv6 mld snooping
Global MLD Snooping configuration:
----------------------------------------
MLD snooping                   : Enabled
MLDv2 snooping (minimal)       : Enabled
Listener message suppression   : Enabled
TCN solicit query              : Disabled
TCN flood query count          : 2
Robustness variable            : 3
Last listener query count      : 2
Last listener query interval   : 1000

Vlan 1:
--------
MLD snooping                         : Disabled
MLDv1 immediate leave                : Disabled
Explicit host tracking               : Enabled
Multicast router learning mode       : pim-dvmrp
Robustness variable                  : 1
Last listener query count            : 2
Last listener query interval         : 1000

<output truncated>

Vlan 951:
--------
MLD snooping                         : Disabled
MLDv1 immediate leave                : Disabled
Explicit host tracking               : Enabled
Multicast router learning mode       : pim-dvmrp
Robustness variable                  : 3
Last listener query count            : 2
Last listener query interval         : 1000
```

## Related Commands

| Command | Description |
|---|---|
| **ipv6 mld snooping** | Enables and configures MLD snooping on the switch or on a VLAN. |
| **sdm prefer** | Configures an SDM template to optimize system resources based on how the switch is being used. |

# show ipv6 mld snooping address

Use the **show ipv6 mld snooping address** command in EXEC mode to display all or specified IP version 6 (IPv6) multicast address information maintained by Multicast Listener Discovery (MLD) snooping.

**show ipv6 mld snooping address** [[**vlan** *vlan-id*] [*ipv6 address*]] [**vlan** *vlan-id*] [**count** | **dynamic** | **user**]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Specify a VLAN about which to show MLD snooping multicast address information. The VLAN ID range is 1 to 1001 and 1006 to 4094. |
| *ipv6-multicast-address* | (Optional) Display information about the specified IPv6 multicast address. This keyword is only available when a VLAN ID is entered. |
| **count** | (Optional) Display the number of multicast groups on the switch or in the specified VLAN. |
| **dynamic** | (Optional) Display MLD snooping learned group information. |
| **user** | (Optional) Display MLD snooping user-configured group information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

Use this command to display IPv6 multicast address information.

You can enter an IPv6 multicast address only after you enter a VLAN ID.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

Use the **dynamic** keyword to display information only about groups that are learned. Use the **user** keyword to display information only about groups that have been configured.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6** global configuration command and reload the switch.

**Note** This command is available only if you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Examples

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

```
Switch# show ipv6 mld snooping address
Vlan Group   Type Version Port List
------------------------------------------------------------
2    FF12::3 user         Fa1/0/2, Gi2/0/2, Gi3/0/1,Gi3/0/3
```

This is an example of output from the **show snooping address count** command:

```
Switch# show ipv6 mld snooping address count
Total number of multicast groups: 2
```

This is an example of output from the **show snooping address user** command:

```
Switch# show ipv6 mld snooping address user
Vlan Group  Type Version Port List
------------------------------------------------------------
2    FF12::3 user  v2    Fa1/0/2, Gi2/0/2, Gi3/0/1,Gi4/0/3
```

## Related Commands

| Command | Description |
|---|---|
| **ipv6 mld snooping vlan** | Configures IPv6 MLD snooping on a VLAN. |
| **sdm prefer** | Configures an SDM template to optimize system resources based on how the switch is being used. |

# show ipv6 mld snooping mrouter

Use the **show ipv6 mld snooping mrouter** command in EXEC mode to display dynamically learned and manually configured IP version 6 (IPv6) Multicast Listener Discovery (MLD) router ports for the switch or a VLAN.

**show ipv6 mld snooping mrouter** [**vlan** *vlan-id*]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

Use this command to display MLD snooping router ports for the switch or for a specific VLAN.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6** global configuration command and reload the switch.

**Note** This command is available only if you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Examples

This is an example of output from the **show ipv6 mld snooping mrouter** command. It displays snooping characteristics for all VLANs on the switch that are participating in MLD snooping.

```
Switch# show ipv6 mld snooping mrouter
Vlan    ports
----    -----
   2    Gi1/0/11(dynamic)
  72    Gi1/0/11(dynamic)
 200    Gi1/0/11(dynamic)
```

This is an example of output from the **show ipv6 mld snooping mrouter vlan** command. It shows multicast router ports for a specific VLAN.

```
Switch# show ipv6 mld snooping mrouter vlan 100
Vlan    ports
----    -----
   2    Gi1/0/11(dynamic)
```

## Related Commands

| Command | Description |
|---|---|
| **ipv6 mld snooping** | Enables and configures MLD snooping on the switch or on a VLAN. |
| **ipv6 mld snooping vlan mrouter interface** *interface-id* \| **static** *ipv6-multicast-address* **interface** *interface-id*] | Configures multicast router ports for a VLAN. |
| **sdm prefer** | Configures an SDM template to optimize system resources based on how the switch is being used. |

# show ipv6 mld snooping querier

Use the **show ipv6 mld snooping querier** command in EXEC mode to display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping querier-related information most recently received by the switch or the VLAN.

**show ipv6 mld snooping querier** [**vlan** *vlan-id*] [**detail**]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094. |
| **detail** | (Optional) Display MLD snooping detailed querier information for the switch or for the VLAN. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

Use the **show ipv6 mld snooping querier** command to display the MLD version and IPv6 address of a detected device that sends MLD query messages, which is also called a *querier*. A subnet can have multiple multicast routers but has only one MLD querier. The querier can be a Layer 3 switch.

The **show ipv6 mld snooping querier** command output also shows the VLAN and interface on which the querier was detected. If the querier is the switch, the output shows the *Port* field as *Router*. If the querier is a router, the output shows the port number on which the querier is learned in the *Port* field.

The output of the **show ipv6 mld snoop querier vlan** command displays the information received in response to a query message from an external or internal querier. It does not display user-configured VLAN values, such as the snooping robustness variable on the particular VLAN. This querier information is used only on the MASQ message that is sent by the switch. It does not override the user-configured robustness variable that is used for aging out a member that does not respond to query messages.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6** global configuration command and reload the switch.

**Note** This command is available only if you have configured a dual IPv4 and IPv6 Switch Database Management (SDM) template on the switch.

## Examples

This is an example of output from the **show ipv6 mld snooping querier** command:

```
Switch# show ipv6 mld snooping querier
Vlan      IP Address               MLD Version Port
------------------------------------------------------------
2         FE80::201:C9FF:FE40:6000 v1          Gi3/0/1
```

This is an example of output from the **show ipv6 mld snooping querier detail** command:

```
Switch# show ipv6 mld snooping querier detail
Vlan      IP Address               MLD Version Port
------------------------------------------------------------
2         FE80::201:C9FF:FE40:6000 v1          Gi3/0/1
```

This is an example of output from the **show ipv6 mld snooping querier vlan** command:

```
Switch# show ipv6 mld snooping querier vlan 2
IP address : FE80::201:C9FF:FE40:6000
MLD version : v1
Port : Gi3/0/1
Max response time : 1000s
```

## Related Commands

| Command | Description |
|---|---|
| **ipv6 mld snooping** | Enables and configures IPv6 MLD snooping on the switch or on a VLAN. |
| **ipv6 mld snooping last-listener-query-count** | Configures the maximum number of queries that the switch sends before aging out an MLD client. |
| **ipv6 mld snooping last-listener-query-interval** | Configures the maximum response time after sending out a query that the switch waits before deleting a port from the multicast group. |
| **ipv6 mld snooping robustness-variable** | Configures the maximum number of queries that the switch sends before aging out a multicast address when there is no response. |
| **sdm prefer** | Configures an SDM template to optimize system resources based on how the switch is being used. |
| **ipv6 mld snooping** | Enables and configures IPv6 MLD snooping on the switch or on a VLAN. |

# show ipv6 route updated

Use the **show ipv6 route updated** command in EXEC mode to display the current contents of the IPv6 routing table.

**show ipv6 route** [*protocol*] **updated** [**boot-up**]{*hh:mm* | *day*{*month* [*hh:mm*]} [{*hh:mm* | *day*{*month* [*hh:mm*]}]

## Syntax Description

| | |
|---|---|
| *protocol* | (Optional) Displays routes for the specified routing protocol using any of these keywords:<br>• **bgp**<br>• **isis**<br>• **ospf**<br>• **rip**<br>or displays routes for the specified type of route using any of these keywords:<br>• **connected**<br>• **local**<br>• **static**<br>• **interface** *interface id* |
| **boot-up** | Display the current contents of the IPv6 routing table. |
| *hh:mm* | Enter the time as a 2-digit number for a 24-hour clock. Make sure to use the colons (:). For example, enter **13:32** |
| *day* | Enter the day of the month. The range is from 1 to 31. |
| *month* | Enter the month in upper case or lower case letters. You can enter the full name of the month, such as **January** or **august**, or the first three letters of the month, such as **jan** or **Aug**. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(37)SE | This command was introduced. |

## Usage Guidelines

Use the **show ipv6 route** privileged EXEC command to display the current contents of the IPv6 routing table.

Examples

This is an example of output from the **show ipv6 route updated rip** command.

```
Switch# show ipv6 route rip updated
IPv6 Routing Table - 12 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
B - BGP, R - RIP, I1 - ISIS L1, I2 - ISIS L2
IA - ISIS interarea, IS - ISIS summary
O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
R 2001::/64 [120/2]
via FE80::A8BB:CCFF:FE00:8D01, GigabitEthernet1/0/1
Last updated 10:31:10 27 February 2007
R 2004::/64 [120/2]
via FE80::A8BB:CCFF:FE00:9001, GigabitEthernet1/0/2
Last updated 17:23:05 22 February 2007
R 4000::/64 [120/2]
via FE80::A8BB:CCFF:FE00:9001, GigabitEthernet1/0/3
Last updated 17:23:05 22 February 2007
R 5000::/64 [120/2]
via FE80::A8BB:CCFF:FE00:9001, GigabitEthernet1/0/4
Last updated 17:23:05 22 February 2007
R 5001::/64 [120/2]
via FE80::A8BB:CCFF:FE00:9001, GigabitEthernet1/0/5
Last updated 17:23:05 22 February 2007
```

**Related Commands**

| Command | Description |
|---|---|
| **show ipv6 route** | Displays the current contents of the IPv6 routing table. |

# show l2protocol-tunnel

Use the **show l2protocol-tunnel** command in EXEC mode to display information about Layer 2 protocol tunnel ports. Displays information for interfaces with protocol tunneling enabled.

**show l2protocol-tunnel** [**interface** *interface-id*] [**summary**]

## Syntax Description

| | |
|---|---|
| **interface** *interface-id* | (Optional) Specify the interface for which protocol tunneling information appears. Valid interfaces are physical ports and port channels; the port channel range is 1 to 48. |
| **summary** | (Optional) Display only Layer 2 protocol summary information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## Usage Guidelines

After enabling Layer 2 protocol tunneling on an access or IEEE 802.1Q tunnel port by using the **l2protocol-tunnel** interface configuration command, you can configure some or all of these parameters:

- Protocol type to be tunneled
- Shutdown threshold
- Drop threshold

If you enter the **show l2protocol-tunnel** [**interface** *interface-id*] command, only information about the active ports on which all the parameters are configured appears.

If you enter the **show l2protocol-tunnel summary** command, only information about the active ports on which some or all of the parameters are configured appears.

## Examples

This is an example of output from the **show l2protocol-tunnel** command:

```
Switch# show l2protocol-tunnel
COS for Encapsulated Packets: 5
Drop Threshold for Encapsulated Packets: 0

Port       Protocol Shutdown  Drop      Encapsulation Decapsulation Drop
                    Threshold Threshold Counter       Counter       Counter
---------- -------- --------- --------- ------------- ------------- -------------
Fa3/0/3    ---           ----      ----          ----          ----          ----
           ---           ----      ----          ----          ----          ----
           ---           ----      ----          ----          ----          ----
           pagp          ----      ----             0        242500
           lacp          ----      ----         24268        242640
           udld          ----      ----             0        897960
Fa3/0/4    ---           ----      ----          ----          ----          ----
           ---           ----      ----          ----          ----          ----
```

```
           ---          ----      ----         ----         ----          ----
           pagp         1000      ----        24249       242700
           lacp         ----      ----        24256       242660
           udld         ----      ----            0       897960
Gi6/0/3    cdp          ----      ----       134482      1344820
           ---          ----      ----         ----         ----          ----
           ---          ----      ----         ----         ----          ----
           pagp         1000      ----            0       242500
           lacp          500      ----            0       485320
           udld          300      ----        44899       448980
Gi6/0/4    cdp          ----      ----       134482      1344820
           ---          ----      ----         ----         ----          ----
           ---          ----      ----         ----         ----          ----
           pagp         ----      1000            0       242700
           lacp         ----      ----            0       485220
           udld          300      ----        44899       448980
```

This is an example of output from the **show l2protocol-tunnel summary** command:

```
Switch# show l2protocol-tunnel summary
COS for Encapsulated Packets: 5
Drop Threshold for Encapsulated Packets: 0

Port     Protocol     Shutdown          Drop              Status
                      Threshold         Threshold
                      (cdp/stp/vtp)     (cdp/stp/vtp)
                      (pagp/lacp/udld)  (pagp/lacp/udld)
-------- ------------ ----------------- ----------------- -----------
Fa3/0/2  --- --- --- ----/----/----    ----/----/----    up
     pagp lacp udld ----/----/----    ----/----/----
Fa9/0/3  --- --- --- ----/----/----    ----/----/----    up
     pagp lacp udld 1000/----/----    ----/----/----
Fa9/0/4  --- --- --- ----/----/----    ----/----/----    up
     pagp lacp udld 1000/ 500/----    ----/----/----
Fa9/0/5  cdp stp vtp ----/----/----    ----/----/----    down
     ---- ---- ---- ----/----/----    ----/----/----
Gi4/0/1  --- --- --- ----/----/----    ----/----/----    down
     pagp ---- ---- ----/----/----    1000/----/----
Gi4/0/2  --- --- --- ----/----/----    ----/----/----    down
     pagp ---- ---- ----/----/----    1000/----/----
```

## Related Commands

| Command | Description |
|---|---|
| clear l2protocol-tunnel counters | Clears counters for protocol tunneling ports. |
| l2protocol-tunnel | Enables Layer 2 protocol tunneling for CDP, STP, or VTP packets on an interface. |
| l2protocol-tunnel cos | Configures a class of service (CoS) value for tunneled Layer 2 protocol packets. |

# show lacp

Use the **show lacp** command in EXEC mode to display Link Aggregation Control Protocol (LACP) channel-group information.

**show lacp** [*channel-group-number*] {**counters** | **internal** | **neighbor** | **sys-id**}

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(14)EA1 | This command was introduced. |
| 12.2(25)SE | The *channel-group-number* range was changed from 1 to 12 to 1 to 48. |

## 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**.

## Examples

This is an example of output from the **show lacp counters** command. Table 2-38 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
Gi2/0/1      19     10       0      0        0      0         0
Gi2/0/2      14     6        0      0        0      0         0
```

*Table 2-38 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
Gi2/0/1     SA      bndl    32768         0x3       0x3     0x4      0x3D
Gi2/0/2     SA      bndl    32768         0x3       0x3     0x5      0x3D
```

Table 2-39 describes the fields in the display:

*Table 2-39 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. |

*Table 2-39 show lacp internal Field Descriptions (continued)*

| Field | Description |
|---|---|
| Admin Key | Administrative key assigned to this port. LACP automatically generates an administrative key value as a hexadecimal number. The administrative key defines the ability of a port to aggregate with other ports. A port's ability to aggregate with other ports is determined by the port physical characteristics (for example, data rate and duplex capability) and configuration restrictions that you establish. |
| Oper Key | Runtime operational key that is being used by this port. LACP automatically generates this value as a hexadecimal number. |
| Port Number | Port number. |
| Port State | 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
Gi2/0/1   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
Gi2/0/2   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** privileged EXEC 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. The output for the **show link state group detail** command displays only those link-state groups that have link-state tracking enabled or that have upstream or downstream interfaces (or both) configured. If there is no link-state group configuration for a group, it is not shown as enabled or disabled.

## Examples

This is an example of output from the **show link state group 1** command:

```
Switch# show link state group 1
Link State Group: 1      Status: Enabled, Down
```

This is an example of output from the **show link state group detail** command:

```
Switch# show link state group detail
(Up):Interface up   (Dwn):Interface Down   (Dis):Interface disabled

Link State Group: 1 Status: Enabled, Down
Upstream Interfaces : Gi1/0/15(Dwn) Gi1/0/16(Dwn)
Downstream Interfaces : Gi1/0/11(Dis) Gi1/0/12(Dis) Gi1/0/13(Dis) Gi1/0/14(Dis)

Link State Group: 2 Status: Enabled, Down
Upstream Interfaces : Gi1/0/15(Dwn) Gi1/0/16(Dwn) Gi1/0/17(Dwn)
Downstream Interfaces : Gi1/0/11(Dis) Gi1/0/12(Dis) Gi1/0/13(Dis) Gi1/0/14(Dis)

(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. |

# show location

Use the **show location** command in EXEC mode to display location information for an endpoint.

**show location admin-tag**

**show location civic-location** {**identifier** *id number* | **interface** *interface-id* | **static**}

**show location elin-location** {**identifier** *id number* | **interface** *interface-id* | **static**}

## Syntax Description

| | |
|---|---|
| **admin-tag** | Display administrative tag or site information. |
| **civic-location** | Display civic location information. |
| **elin-location** | Display emergency location information (ELIN). |
| **identifier** *id* | Specify the ID for the civic location or the elin location. The id range is 1 to 4095. |
| **interface** *interface-id* | (Optional) Display location information for the specified interface or all interfaces. Valid interfaces include physical ports. |
| **static** | Display static configuration information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(14)EA1 | This command was introduced. |

## Usage Guidelines

Use the **show location** command to display location information for an endpoint.

## Examples

This is an example of output from the **show location civic-location** command that displays location information for an interface:

```
Switch# show location civic interface gigibitethernet2/0/1
Civic location information
--------------------------
Identifier             : 1
County                 : Santa Clara
Street number          : 3550
Building               : 19
Room                   : C6
Primary road name      : Cisco Way
City                   : San Jose
State                  : CA
Country                : US
```

This is an example of output from the **show location civic-location** command that displays all the civic location information:

```
Switch# show location civic-location static
Civic location information
--------------------------
Identifier              : 1
County                  : Santa Clara
Street number           : 3550
Building                : 19
Room                    : C6
Primary road name       : Cisco Way
City                    : San Jose
State                   : CA
Country                 : US
Ports                   : Gi2/0/1
--------------------------
Identifier              : 2
Street number           : 24568
Street number suffix    : West
Landmark                : Golden Gate Bridge
Primary road name       : 19th Ave
City                    : San Francisco
Country                 : US
--------------------------
```

This is an example of output from the **show location elin-location** command that displays the emergency location information:

```
Switch# show location elin-location identifier 1
Elin location information
--------------------------
Identifier : 1
Elin       : 14085553881
Ports      : Gi2/0/2
```

This is an example of output from the **show location elin static** command that displays all emergency location information:

```
Switch# show location elin static
Elin location information
--------------------------
Identifier : 1
Elin       : 14085553881
Ports      : Gi2/0/2
--------------------------
Identifier : 2
Elin       : 18002228999
--------------------------
```

## Related Commands

| Command | Description |
|---|---|
| **location (global configuration)** | Configures the global location information for an endpoint. |
| **location (interface configuration)** | Configures the location information for an interface. |

# show logging smartlog

To display smart logging information, use the **show logging smartlog** command in privileged EXEC mode.

**show logging smartlog** [**event-ids** | **events** | **statistics** {**interface** *interface-id* | **summary**}]

## Syntax Description

| | |
|---|---|
| **event-ids** | (Optional) Displays the IDs and names of smart log events. The NetFlow collector uses the event IDs to identify each event. |
| **events** | (Optional) Displays descriptions of smart log events. The display shows the last 10 smart logging events. |
| **statistics** | (Optional) Displays smart log statistics. |
| **interface** *interface-id* | Displays smart log statistics for the specified interface. |
| **summary** | Displays a summary of the smart log event statistics. |

## Command Default

There is no default.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(58)SE | This command was introduced. |

## Usage Guidelines

You can configure smart logging of packets dropped because of DHCP snooping violations, Dynamic ARP inspection violations, IP source guard denied traffic, or ACL permitted or denied traffic. The packet contents are sent to the identified Cisco IOS NetFlow collector.

The statistics counters reflect the number of packets that have been sent to the collector by smart logging.

## Examples

This is an example of output from the **show logging smartlog events** command. The output shows the last 10 smart logging events.

```
Switch #show logging smartlog events
Event: DAI      Extended Event:DAI_DENY_INVALID_PKT Interface: Gi1/0/5
Input Vlan: 2   Timestamp: 05:05:51 UTC Mar 2 1993
pkt-section:
FFFFFFFFFFFF00000700010E080600010800060400000000000E00000600000000012DADA1CC1FFFFFFFF000102
030405060708090A0B0C0D0E0F101112131415
Event: DHCPSNP  Extended Event:DHCPSNP_DENY_INVALID_MSGTYPE Interface: Gi1/0/3      Input
Vlan: 2   Timestamp: 05:05:51 UTC Mar 2 1993pkt-section:
FFFFFFFFFFFF000007000100080045000016E000100008011BDB70A0571C2FFFFFFFF00440043015A06B3020106
000000007A00008000000000000000000000000
Event: ACL      Extended Event:PACL_PERMIT Interface: Gi1/0/2      Input Vlan: 3
Timestamp: 05:05:56 UTC Mar 2 1993
```

```
pkt-section:
9CAFCA7F3E430000070001110800450000 2E0000000040060CBFAC140B70AC140A731875005000000000000000
0050000000230500000000102030405
Event: IPSG     Extended Event:IPSG_DENY
Interface: Gi1/0/2      Input Vlan: 3   Timestamp: 05:06:37 UTC Mar 2 1993
pkt-section:
FFFFFFFFFFFF0000070001110800450000 2E0000000040FFC257AC140B66FFFFFFFF0001020304050607080 90A
0B0C0D0E0F10111213141516171819
```

This is an example of output from the **show logging smartlog event-ids** command:

```
Switch #show logging smartlog event-ids
EventID: 1      Description: DHCPSNP
Extended Events:
----------------------------------------
    ID    |         Description
----------------------------------------
    1     |         DHCPSNP_DENY_INVALID_MSGTYPE
    2     |         DHCPSNP_DENY_INVALID_PKTLEN
    3     |         DHCPSNP_DENY_INVALID_BIND
    4     |         DHCPSNP_DENY_INVALID_OPT
    5     |         DHCPSNP_DENY_OPT82_DISALLOW
    6     |         DHCPSNP_DENY_SRCMAC_MSMTCH

EventID: 2      Description: DAI
Extended Events:
----------------------------------------
    ID    |         Description
----------------------------------------
    1     |         DAI_DENY_INVALID_BIND
    2     |         DAI_DENY_INVALID_SRCMAC
    3     |         DAI_DENY_INVALID_IP
    4     |         DAI_DENY_ACL
    5     |         DAI_DENY_INVALID_PKT
    6     |         DAI_DENY_INVALID_DSTMAC

EventID: 3      Description: IPSG
Extended Events:
----------------------------------------
    ID    |         Description
----------------------------------------
    1     |         IPSG_DENY

EventID: 4      Description: ACL
Extended Events:
----------------------------------------
    ID    |         Description
----------------------------------------
    1     |         PACL_PERMIT
    2     |         PACL_DENY
```

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

```
Switch# show logging smartlog statistics summary

Total number of  logged packets: 0
    Total number of DHCP Snooping logged packets: 0
                                                                    DHCPSNP_PERMIT: 0
                DHCPSNP_DENY_INVALID_MSGTYPE: 0
                    DHCPSNP_DENY_INVALID_PKTLEN: 0
                DHCPSNP_DENY_INVALID_BINDING: 0

  Total number of Dynamic ARP Inspection logged packets: 0
                                                                        DAI_PERMIT: 0
                                    DAI_DENY_INVALID_BIND: 0
                                DAI_DENY_INVALID_SRCMAC: 0
                                            DAI_DENY_INVALID_IP: 0

    Total number of IP Source Guard logged packets: 0

IPSG_DENY: 0

                Total number of ACL logged packets: 0

PACL_PERMIT: 0

PACL_DENY: 0
```

This is an example of output from the **show logging smartlog statistics interface** command:

```
Switch# show logging smartlog statistics interface gigabitethernet 0/1
Total number of DHCP Snooping logged packets: 0
        DHCPSNP_DENY_INVALID_MSGTYPE: 0
        DHCPSNP_DENY_INVALID_PKTLEN: 0
        DHCPSNP_DENY_INVALID_BIND: 0
        DHCPSNP_DENY_INVALID_OPT: 0
        DHCPSNP_DENY_OPT82_DISALLOW: 0
        DHCPSNP_DENY_SRCMAC_MSMTCH: 0
Total number of Dynamic ARP Inspection logged packets: 0
        DAI_DENY_INVALID_BIND: 0
        DAI_DENY_INVALID_SRCMAC: 0
        DAI_DENY_INVALID_IP: 0
        DAI_DENY_ACL: 0
        DAI_DENY_INVALID_PKT: 0
        DAI_DENY_INVALID_DSTMAC: 0
Total number of IP Source Guard logged packets: 793
        IPSG_DENY: 793
Total number of ACL logged packets: 10135
        PACL_PERMIT: 10135
        PACL_DENY: 0
```

## Related Commands

| Command | Description |
|---|---|
| **ip arp inspection smartlog** | Enables smart logging of dynamic ARP inspection dropped packets. |
| **ip dhcp snooping** | Enables smart logging of IP DHCP snooping dropped packets. |
| **ip verify source smartlog** | Enables smart logging of IP source guard dropped packets. |
| **logging smartlog** | Globally enables smart logging. |

# show mac access-group

Use the **show mac access-group** command in EXEC mode to display the MAC access control lists (ACLs) configured for an interface or a switch.

**show mac access-group** [**interface** *interface-id*]

## 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). |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(14)EA1 | This command was introduced. |

## Examples

This is an example of output from the **show mac-access group** command. Port 2 has the MAC access list *macl_e1* applied; no MAC ACLs are applied to other interfaces.

```
Switch# show mac access-group
Interface GigabitEthernet1/0/1:
   Inbound access-list is not set
Interface GigabitEthernet1/0/2:
   Inbound access-list is macl_e1
Interface GigabitEthernet1/0/3:
   Inbound access-list is not set
Interface GigabitEthernet1/0/4:
   Inbound access-list is not set

<output truncated>
```

This is an example of output from the **show mac access-group interface** command:

```
Switch# show mac access-group interface gigabitethernet1/0/1
Interface GigabitEthernet1/0/1:
   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** command in EXEC mode 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**

## Syntax Description

This command has no arguments or keywords

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table** command (with the hyphen) was replaced by the **show mac address-table** command (without the hyphen). |

## 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    Gi6/0/4
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. |

| Command | Description |
|---|---|
| **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** command in EXEC mode to display MAC address table information for the specified MAC address.

**show mac address-table address** *mac-address* [**interface** *interface-id*] [**vlan** *vlan-id*]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table address** command (with the hyphen) was replaced by the **show mac address-table address** command (without the hyphen). |

## 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. |

| Command | Description |
|---|---|
| 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** command in EXEC mode 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*]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Display aging time information for a specific VLAN. The range is 1 to 4094. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table aging-time** command (with the hyphen) was replaced by the **show mac address-table aging-time** command (without the hyphen). |

## Usage Guidelines

If no VLAN number is specified, the aging time for all VLANs appears.

## 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** command in EXEC mode to display the number of addresses present in all VLANs or the specified VLAN.

**show mac address-table count** [**vlan** *vlan-id*]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Display the number of addresses for a specific VLAN. The range is 1 to 4094. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table count** command (with the hyphen) was replaced by the **show mac address-table count** command (without the hyphen). |

## Usage Guidelines

If no VLAN number is specified, the address count for all VLANs appears.

## 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** command in EXEC mode to display only dynamic MAC address table entries.

**show mac address-table dynamic** [**address** *mac-address*] [**interface** *interface-id*] [**vlan** *vlan-id*]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table dynamic** command (with the hyphen) was replaced by the **show mac address-table dynamic** command (without the hyphen). |

## 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 Gi6/0/2
   1    00b0.6496.2741  DYNAMIC Gi6/0/2
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. |

| Command | Description |
|---|---|
| **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*]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table interface** command (with the hyphen) was replaced by the **show mac address-table interface** command (without the hyphen). |

## Examples

This is an example of output from the **show mac address-table interface** command:

```
Switch# show mac address-table interface gigabitethernet6/0/2
          Mac Address Table
-------------------------------------------

Vlan    Mac Address     Type    Ports
----    -----------     ----    -----
   1    0030.b635.7862  DYNAMIC Gi6/0/2
   1    00b0.6496.2741  DYNAMIC Gi6/0/2
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. |

| Command | Description |
|---|---|
| **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 learning

Use the **show mac address-table learning** command in EXEC mode to display the status of MAC address learning for all VLANs or the specified VLAN.

**show mac address-table learning** [**vlan** *vlan-id*]

## Syntax Description

| | |
|---|---|
| **vlan** *vlan-id* | (Optional) Display information for a specific VLAN. The range is 1 to 4094. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(46)SE1 | This command was introduced. |

## Usage Guidelines

Use the **show mac address-table learning** command without any keywords to display configured VLANs and whether MAC address learning is enabled or disabled on them. The default is that MAC address learning is enabled on all VLANs. Use the command with a specific VLAN ID to display the learning status on an individual VLAN.

**Note**

## Examples

This is an example of output from the **show mac address-table learning** command showing that MAC address learning is disabled on VLAN 200:

```
Switch# show mac address-table learning
VLAN    Learning Status
----    ---------------
1             yes
100           yes
200           no
```

## Related Commands

| Command | Description |
|---|---|
| **mac address-table learning vlan** | Enables or disables MAC address learning on a VLAN. |

# show mac address-table move update

Use the **show mac address-table move update** command in EXEC mode to display the MAC address-table move update information on the switch.

**show mac address-table move update**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

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

## 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** command in EXEC mode to display the MAC address notification settings for all interfaces or the specified interface.

**show mac address-table notification** {**change** [**interface** [*interface-id*] | **mac-move** | **threshold**}

## Syntax Description

| | |
|---|---|
| **change** | Display the MAC change notification feature parameters and the history table. |
| **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. |
| **mac-move** | Display status for MAC address move notifications. |
| **threshold** | Display status for MAC-address table threshold monitoring. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table notification** command (with the hyphen) was replaced by the **show mac address-table notification** command (without the hyphen). |
| 12.2(40)SE | The **change**, **mac-move**, and **threshold** keywords were added. |

## Usage Guidelines

Use the **show mac address-table notification change** command without keywords to see if the MAC address change notification 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 notifications for all interfaces. If the *interface-id* is included, only the flags for that interface appear.

## Examples

This is an example of output from the **show mac address-table notification change** command:

```
Switch# show mac address-table notification change
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. |
| **mac address-table notification** | Enables the MAC address notification feature for MAC address changes, moves, or address-table thresholds. |
| **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** command in EXEC mode to display only static MAC address table entries.

**show mac address-table static** [**address** *mac-address*] [**interface** *interface-id*] [**vlan** *vlan-id*]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table static** command (with the hyphen) was replaced by the **show mac address-table static** command (without the hyphen). |

## 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. |

| 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 vlan** | Displays the MAC address table information for the specified VLAN. |

# show mac address-table vlan

Use the **show mac address-table vlan** command in EXEC mode to display the MAC address table information for the specified VLAN.

**show mac address-table vlan** *vlan-id*

## Syntax Description

| | |
|---|---|
| *vlan-id* | (Optional) Display addresses for a specific VLAN. The range is 1 to 4094. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(19)EA1 | The **show mac-address-table vlan** command (with the hyphen) was replaced by the **show mac address-table vlan** command (without the hyphen). |

## 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. |

| Command | Description |
|---|---|
| **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** command in EXEC mode to display global quality of service (QoS) configuration information.

**show mls qos**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Examples

This is an example of output from the **show mls qos** command when QoS is enabled and DSCP transparency is enabled:

```
Switch# show mls qos
QoS is enabled
QoS ip packet dscp rewrite is enabled
```

## Related Commands

| Command | Description |
|---|---|
| mls qos | Enables QoS for the entire switch. |

# show mls qos aggregate-policer

Use the **show mls qos aggregate-policer** command in EXEC mode to display the quality of service (QoS) aggregate policer configuration.

**show mls qos aggregate-policer** [*aggregate-policer-name*]

## Syntax Description

| | |
|---|---|
| *aggregate-policer-name* | (Optional) Display the policer configuration for the specified name. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

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.

## 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** command in EXEC mode to display quality of service (QoS) settings for the ingress queues.

**show mls qos input-queue**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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** command in EXEC mode to display quality of service (QoS) information at the port level.

**show mls qos interface** [*interface-id*] [**buffers | queueing | statistics**]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

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

## 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 gigabitethernet1/0/1
GigabitEthernet1/0/1
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 gigabitethernet1/0/2
GigabitEthernet1/0/2
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 gigabitethernet1/0/2 buffers
GigabitEthernet1/0/2
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 gigabitethernet1/0/2 queueing
GigabitEthernet1/0/2
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 2-40 describes the fields in this display.

```
Switch# show mls qos interface gigabitethernet1/0/2 statistics
GigabitEthernet1/0/2

  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 2-40 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. |
| **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** command in EXEC mode to display quality of service (QoS) mapping information.

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**]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

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.

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** command in EXEC mode to display quality of service (QoS) settings for the egress queues.

**show mls qos queue-set** [*qset-id*]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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** command in EXEC mode to display the policy maps attached to a switch virtual interface (SVI).

**show mls qos vlan** *vlan-id*

## Syntax Description

| | |
|---|---|
| *vlan-id* | Specify the VLAN ID of the SVI to display the policy maps. The range is 1 to 4094. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(25)SE | 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.

## 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** command in EXEC mode to display information about all Switched Port Analyzer (SPAN) and Remote SPAN (RSPAN) sessions on the switch.

**show monitor** [**session** {*session_number* | **all** | **local** | **range** *list* | **remote**}

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **range** *list* and **detail** keywords were added. |

## Usage Guidelines

Use the command with keywords to show a specific session, all sessions, all local sessions, or all remote sessions.

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** command:

```
Switch# show monitor
Session 1
---------
Type : Local Session
Source Ports :
RX Only : Fa4/0/1
Both : Fa4/0/2-3,Fa4/0/5-6
Destination Ports : Fa4/0/20
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** command for local SPAN source session 1:

```
Switch# show monitor session 1
Session 1
---------
Type : Local Session
Source Ports :
RX Only : Fa4/0/1
Both : Fa4/0/2-3,Fa4/0/5-6
Destination Ports : Fa4/0/20
Encapsulation : Replicate
Ingress : Disabled
```

This is an example of output for the **show monitor session all** command when ingress traffic forwarding is enabled:

```
Switch# show monitor session all
Session 1
---------
Type : Local Session
Source Ports :
Both : Fa4/0/2
Destination Ports : Fa4/0/3
Encapsulation : Native
Ingress : Enabled, default VLAN = 5
Ingress encap : DOT1Q

Session 2
---------
Type : Local Session
Source Ports :
Both : Fa4/0/8
Destination Ports : Fa4/0/2
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.

**show mvr**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

The command information includes 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).

## Examples

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

```
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
```

## 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.

**show mvr interface** [*interface-id* [**members** [**vlan** *vlan-id*]]]

## Syntax Description

| | |
|---|---|
| *interface-id* | (Optional) Display MVR type, status, and Immediate Leave setting for the interface.<br>**Note** Valid interfaces include physical ports (including type, stack member, 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. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | 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.

Use the command with keywords to display MVR parameters for a specific receiver port.

## Examples

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

```
Switch# show mvr interface
Port        Type            Status          Immediate Leave
----        ----            -------         ---------------
Gi1/0/1   SOURCE          ACTIVE/UP       DISABLED
Gi1/0/2   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 gigabitethernet1/0/2
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 gigabitethernet1/0/2 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*]

## 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. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | 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.

## 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          Gi1/0/1(d), Gi1/0/2(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          Gi1/0/1(d), Gi1/0/2(d), Gi1/0/3(d),
                                     Gi1/0/4(d), Gi1/0/5(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 network-policy profile

Use the **show network policy profile** privileged EXEC command to display the network-policy profiles.

**show network-policy profile** [*profile number*] [**detail**]

## Syntax Description

| | |
|---|---|
| *profile number* | (Optional) Display the network-policy profile number. If no profile is entered, all network-policy profiles appear. |
| **detail** | (Optional) Display detailed status and statistics information. |

## Command Modes

Privileged EXEC

## Command History

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

## Examples

This is an example of output from the **show network-policy profile** command:

```
Switch# show network-policy profile
Network Policy Profile 10
   voice vlan 17 cos 4
  Interface:
   none
Network Policy Profile 30
   voice vlan 30 cos 5
  Interface:
   none
Network Policy Profile 36
   voice vlan 4 cos 3
  Interface:
   Interface_id
```

## Related Commands

| Command | Description |
|---|---|
| **network-policy** | Applies a network-policy to an interface. |
| **network-policy profile (global configuration)** | Creates the network-policy profile. |
| **network-policy profile (network-policy configuration)** | Configures the attributes of network-policy profiles. |

# show nmsp

Use the **show nmsp** privileged EXEC command to display the Network Mobility Services Protocol (NMSP) information for the switch. This command is available only when your switch is running the cryptographic (encrypted) software image.

**show nmsp** {**attachment suppress interface** | **capability** | **notification interval** | **statistics** {**connection** | **summary**} | **status** | **subscription** {**detail** | **summary**}}

## Syntax Description

| | |
|---|---|
| **attachment suppress interface** | Display attachment suppress interfaces. |
| **capability** | Display switch capabilities including the supported services and subservices. |
| **notification interval** | Display the notification intervals of the supported services. |
| **statistics** {**connection** \| **summary**} | Display the NMSP statistics information.<br>• **connection**—display the message counters on each connection.<br>• **summary**—display the global counters. |
| **status** | Display information about the NMSP connections. |
| **subscription** {**detail** \| **summary**} | Display the subscription information on each NMSP connection.<br>• **detail**—display all services and subservices subscribed on each connection.<br>• **summary**—display all services subscribed on each connection. |

## Command Modes

Privileged EXEC

## Command History

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

## Examples

This is an example of output from the **show nmsp attachment suppress interface** command:

```
Switch# show nmsp attachment suppress interface
NMSP Attachment Suppression Interfaces
------------------------------------
GigabitEthernet1/1
GigabitEthernet1/2
```

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

```
Switch# show nmsp capability
NMSP Switch Capability
------------------------------
Service          Subservice
-----------       --------------
Attachment    Wired Station
Location        Subscription
```

This is an example of output from the **show nmsp notification interval** command:

```
Switch# show nmsp notification interval
NMSP Notification Intervals
---------------------------------
Attachment notify interval: 30 sec (default)
Location notify interval: 30 sec (default)
```

This is an example of output from the **show nmsp statistics connection** and **show nmsp statistics summary** commands:

```
Switch# show nmsp statistics connection
NMSP Connection Counters
---------------------------------
Connection 1:
   Connection status: UP
   Freed connection: 0

   Tx message count       Rx message count
   ----------------------     ----------------------
   Subscr Resp: 1            Subscr Req: 1
   Capa Notif: 1              Capa Notif: 1
   Atta Resp: 1                Atta Req: 1
   Atta Notif: 0
   Loc Resp: 1                 Loc Req: 1
   Loc Notif: 0
Unsupported msg: 0

Switch# show nmsp statistics summary
NMSP Global Counters
----------------------------
  Send too big msg: 0
  Failed socket write: 0
  Partial socket write: 0
  Socket write would block: 0
  Failed socket read: 0
  Socket read would block: 0
  Transmit Q full: 0
  Max Location Notify Msg: 0
  Max Attachment Notify Msg: 0
Max Tx Q Size: 0
```

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

```
Switch# show nmsp status
NMSP Status
---------------
NMSP: enabled
MSE IP Address    TxEchoResp RxEchoReq TxData RxData
172.19.35.109       5 5 4 4
```

This is an example of output from the **show nmsp show subscription detail** and the **show nmsp show subscription summary** commands:

```
Switch# show nmsp subscription detail
Mobility Services Subscribed by 172.19.35.109:
Services                Subservices
-----------------      -------------------
Attachment:          Wired Station
Location:               Subscription

Switch# show nmsp subscription summary
Mobility Services Subscribed:
MSE IP Address     Services
```

```
--------------------     ---------------------
172.19.35.109       Attachment, Location
```

## Related Commands

| Command | Description |
|---|---|
| clear nmsp statistics | Clears the NMSP statistic counters. |
| nmsp | Enables Network Mobility Services Protocol (NMSP) on the switch. |

# show pagp

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

**show pagp** [*channel-group-number*] {**counters** | **dual-active** | **internal** | **neighbor**} ]

## Syntax Description

| | |
|---|---|
| *channel-group*-number | (Optional) Number of the channel group. The range is 1 to 48. |
| **counters** | Display traffic information. |
| **dual-active** | Display the dual-active status. |
| **internal** | Display internal information. |
| **neighbor** | Display neighbor information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(25)SE | The *channel-group-number* range was changed from 1 to 12 to 1 to 48. |
| 12.2(46)SE | The **dual-active** keyword was added. |

## 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.

## 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
  Gi1/0/1    45     42       0      0
  Gi1/0/2    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
Gi1/0/1     SC    U6/S7   H       30s      1        128        Any      16
Gi1/0/2     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.
   Gi1/0/1   switch-p2            0002.4b29.4600   Gi01//1       9s SC      10001
   Gi1/0/2   switch-p2            0002.4b29.4600   Gi1/0/2      24s SC      10001
```

This is an example of output from the **show pagp dual-active** command:

```
Switch# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1

Channel group 1
          Dual-Active     Partner              Partner   Partner
Port      Detect Capable  Name                 Port      Version
Gi1/0/1   No              Switch               Gi3/0/3   N/A
Gi1/0/2   No              Switch               Gi3/0/4   N/A

<output truncated>
```

## Related Commands

| Command | Description |
|---|---|
| clear pagp | Clears PAgP channel-group information. |

# show policy-map

Use the **show policy-map** command in EXEC mode to display quality of service (QoS) policy maps, which define classification criteria for incoming traffic.

**show policy-map** [*policy-map-name* [**class** *class-map-name*]]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

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.

Policy maps can include policers that specify the bandwidth limitations and the action to take if the limits are exceeded.

## 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**]

## Syntax Description

| | | |
|---|---|---|
| **interface** *interface-id* | **Note** | (Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, stack member, 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**. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **vlan** keyword was added (visible only on trunk ports). |

## 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**.

## 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)
---------------------------------------------------------------------------
     Gi1/0/1         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 gigabitethernet1/0/1
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    Gi1/0/2     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 gigabitethernet**1/0/**2 address** command:

```
Switch# show port-security interface gigabitethernet1/0/2 address
          Secure Mac Address Table
-----------------------------------------------------------------------
Vlan    Mac Address       Type                Ports   Remaining Age
                                                         (mins)
----    -----------       ----                -----   -------------
   1    0006.0700.0800    SecureConfigured    Gi1/0/2     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 gigabitethernet1/0/2 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 power inline

Use the **show power inline** command in EXEC mode to display the Power over Ethernet (PoE) status for the specified PoE port or for all PoE ports.

**show power inline** [[*interface-id* | **consumption** ] | **module** *switch-number*]

## Syntax Description

| | | |
|---|---|---|
| *interface-id* | (Optional) Display PoE-related power management information for the specified interface. | |
| **consumption** | (Optional) Display the power allocated to devices connected to PoE ports. | |
| **module** *switch-number* | **Note** | (Optional) Limit the display to ports on the specified stack member. The switch number is 1 to 9. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(19)EA1 | This command was introduced. |
| 12.2(25)SEC | The **consumption** keywords were added. |

## Examples

This is an example of output from the **show power inline** command. In the display, port 2 is configured as static; power has been pre-allocated to this port, but no powered device is connected. Port 6 is a static port in the power-deny state because its maximum wattage is configured for 10 W. The connected powered device has a reported class maximum wattage for a Class 0 or Class 3 device. Table 2-41 describes the output fields.

```
Switch# show power inline
Module   Available     Used     Remaining
          (Watts)     (Watts)    (Watts)
------   ---------   --------   ---------
1            370.0      114.9       255.1
2            370.0       34.3       335.

Interface Admin  Oper       Power   Device              Class Max
                            (Watts)
--------- ------ ---------- ------- ------------------- ----- ----
Fa1/0/1   auto   on         6.3     IP Phone 7910       n/a   15.4
Fa1/0/2   static off        15.4    n/a                 n/a   15.4
Fa1/0/3   auto   on         6.3     IP Phone 7910       n/a   15.4
Fa1/0/4   auto   on         6.3     IP Phone 7960       2     15.4
Fa1/0/5   static on         15.4    IP Phone 7960       2     15.4
Fa1/0/6   static power-deny 10.0    n/a                 n/a   10.0
Fa1/0/7   auto   on         6.3     IP Phone 7910       n/a   15.4
<output truncated>
```

This is an example of output from the **show power inline** command on a port:

```
Switch# show power inline fastethernet2/0/1
Interface Admin  Oper       Power   Device              Class Max
                            (Watts)
--------- ------ ---------- ------- ------------------- ----- ----
Fa2/0/1   auto   on         6.3     IP Phone 7910       n/a   15.4
```

This is an example of output from the **show power inline consumption** command on all PoE switch ports:

```
Switch# show power inline consumption
Default PD consumption : 15400 mW
```

This is an example of output from the **show power inline module** *switch-number* command on stack member 1:

```
Switch# show power inline module 1
Module   Available     Used     Remaining
          (Watts)     (Watts)    (Watts)
------   ---------   --------   ---------
1           370.0      166.2       203.9
Interface Admin  Oper       Power   Device              Class Max
                            (Watts)
--------- ------ ---------- ------- ------------------- ----- ----
Fa1/0/1   auto   on         6.3     IP Phone 7910       n/a   15.4
Fa1/0/2   auto   on         6.3     IP Phone 7910       n/a   15.4
Fa1/0/3   auto   on         6.3     IP Phone 7910       n/a   15.4
Fa1/0/4   auto   on         6.3     IP Phone 7910       n/a   15.4
Fa1/0/5   auto   on         6.3     IP Phone 7910       n/a   15.4
Fa1/0/6   auto   on         6.3     IP Phone 7910       n/a   15.4
<output truncated>
```

***Table 2-41 show power inline interface Field Descriptions***

| Field | Description |
|---|---|
| Admin | Administration mode: auto, off, static |
| Oper | Operating mode:<br>• on—the powered device is detected, and power is applied.<br>• off—no PoE is applied.<br>• faulty—device detection or a powered device is in a faulty state.<br>• power-deny—a powered device is detected, but no PoE is available, or the maximum wattage exceeds the detected powered-device maximum. |
| Power | The supplied PoE in watts |
| Device | The device type detected: n/a, unknown, Cisco powered-device, IEEE powered-device, <name from CDP> |
| Class | The IEEE classification: n/a, Class <0–4> |
| Available | The total amount of PoE in the system |
| Used | The amount of PoE allocated to ports |
| Remaining | The amount of PoE not allocated to ports in the system. (Available – Used = Remaining) |

## Related Commands

| Command | Description |
|---|---|
| **logging event power-inline-status** | Enables the logging of PoE events. |
| **power inline** | Configures the power management mode for the specified PoE port or for all PoE ports. |
| **show controllers power inline** | Displays the values in the registers of the specified PoE controller. |

# show psp config

To display the status of protocol storm protection configured for a specific protocol on a VLAN, use the **show psp config** privileged EXEC command.

**show psp config** {**arp** | **dhcp** | **igmp**}

## Syntax Description

| | |
|---|---|
| **arp** | Show protocol storm protection status for ARP and ARP snooping. |
| **dhcp** | Show protocol storm protection status for DHCP and DHCP snooping. |
| **igmp** | Show protocol storm protection status for IGMP and IGMP snooping. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(58)SE | This command was introduced. |

## Examples

This is an example of output from the **show psp config dhcp** command with protocol storm protection configured to drop packets when the incoming rate exceeds 35 packets per second.

```
Switch# show psp config dhcp

-----------------------------------
PSP Protocol Configuration Summary:
-----------------------------------

DHCP Rate Limit    : 35 packets/sec
PSP Action         : Packet Drop
```

## Related Commands

| Command | Description |
|---|---|
| **psp** {**arp** \| **dhcp** \| **igmp**} **pps** *value* | Configures protocol storm protection for ARP, DHCP, or IGMP. |
| **show psp statistics** | Displays the number of dropped packets when protocol storm protection is configured. |
| **clear psp counter** | Clears the counter of dropped packets. |

# show psp statistics

To display the number of packets dropped for all protocols when protocol storm protection is configured, use the **show psp statistics** privileged EXEC command.

**show psp statistics** [**arp** | **dhcp** | **igmp**]

## Syntax Description

| | |
|---|---|
| **arp** | (Optional) Show the number of packets dropped for ARP and ARP snooping. |
| **dhcp** | (Optional) Show the number of packets dropped for DHCP and DHCP snooping. |
| **igmp** | (Optional) Show the number of packets dropped for IGMP and IGMP snooping. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(58)SE | This command was introduced. |

## Examples

This is an example of output from the **show psp statistics dhcp** command when protocol storm protection is configured for DHCP. The output shows that 13 packets were dropped.

```
Switch# show psp statistics dhcp

---------------------------------
PSP Protocol Drop Counter Summary:
---------------------------------
DHCP Drop Counter: 13
```

## Related Commands

| Command | Description |
|---|---|
| **psp** {**arp** \| **dhcp** \| **igmp**} **pps** *value* | Configures protocol storm protection for ARP, DHCP, or IGMP. |
| **show psp config** | Displays the protocol storm protection configuration. |
| **clear psp counter** | Clears the counter of dropped packets. |

# show sdm prefer

Use the **show sdm prefer** privileged EXEC command to display information about the Switch Database Management (SDM) templates.

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

## Syntax Description

| | |
|---|---|
| **access** | (Optional) Display the template that maximizes system resources for ACLs. |
| **default** | (Optional) Display the template that balances system resources among features. |
| **dual-ipv4-and-ipv6** {**default** \| **routing** \| **vlan**} | (Optional) Display the dual templates that support both IPv4 and IPv6.<br>• **default—**Display the default dual template configuration.<br>• **routing—**Display the routing dual template configuration.<br>• **vlan—**Display the VLAN dual template configuration. |
| **routing** | (Optional) Display the template that maximizes system resources for routing. |
| **vlan** | (Optional) Display the template that maximizes system resources for Layer 2 VLANs. |
| **desktop** | (Optional) For Catalyst 3750-12S aggregator switches only, display the desktop templates. For this switch, when you do not enter the **desktop** keyword, the aggregator templates appear. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **desktop** keyword was added. |
| 12.2(25)SE | The **dual-ipv4-and-ipv6** {**default** \| **vlan**) keywords were added. |
| 12.2(25)SED | The **access** keyword was added. |
| 12.2(25)SEE | The **routing** keyword was added for the dual IPv4 and IPv6 template. |

## Usage Guidelines

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

The numbers displayed for each template represent an approximate maximum number for each feature resource. The actual number might vary, depending on the actual number of other features configured.

## Examples

This is an example of output from the **show sdm prefer** command, displaying the template in use:

```
Switch# show sdm prefer
The current template is "desktop default" template.
 The selected template optimizes the resources in
 the switch to support this level of features for
 8 routed interfaces and 1024 VLANs.

  number of unicast mac addresses:             6K
  number of igmp groups + multicast routes:    1K
  number of unicast routes:                    8K
    number of directly connected hosts:        6K
    number of indirect routes:                 2K
  number of policy based routing aces:         0
  number of qos aces:                          512
  number of security aces:                     1K
```

This is a sample output from the **show sdm prefer routing** command entered on an aggregator switch:

```
Switch# show sdm prefer routing
"aggregate routing" template:
 The selected template optimizes the resources in
 the switch to support this level of features for
 8 routed interfaces and 1024 VLANs.

  number of unicast mac addresses:             6K
  number of igmp groups + multicast routes:    1K
  number of unicast routes:                    20K
    number of directly connected hosts:        6K
    number of indirect routes:                 14K
  number of policy based routing aces:         512
  number of qos aces:                          512
  number of security aces:                     1K
```

This is an example of output from the **show sdm prefer routing** command entered on a desktop switch:

```
Switch# show sdm prefer routing
"desktop routing" template:
 The selected template optimizes the resources in
 the switch to support this level of features for
 8 routed interfaces and 1024 VLANs.

  number of unicast mac addresses:             3K
  number of igmp groups + multicast routes:    1K
  number of unicast routes:                    11K
    number of directly connected hosts:        3K
    number of indirect routes:                 8K
  number of policy based routing aces:         512
  number of qos aces:                          512
  number of security aces:                     1K
```

This is an example of output from the **show sdm prefer dual-ipv4-and-ipv6 default** command entered on a desktop switch:

```
Switch# show sdm prefer dual-ipv4-and-ipv6 default
 "desktop IPv4 and IPv6 default" template:
 The selected template optimizes the resources in
 the switch to support this level of features for
 8 routed interfaces and 1024 VLANs.

  number of unicast mac addresses:                 2K
  number of IPv4 IGMP groups + multicast routes:   1K
  number of IPv4 unicast routes:                   3K
    number of directly-connected IPv4 hosts:       2K
```

```
    number of indirect IPv4 routes:                 1K
  number of IPv6 multicast groups:                  1K
  number of directly-connected IPv6 addresses:      2K
  number of indirect IPv6 unicast routes:           1K
  number of IPv4 policy based routing aces:         0
  number of IPv4/MAC qos aces:                      512
  number of IPv4/MAC security aces:                 1K
  number of IPv6 policy based routing aces:         0
  number of IPv6 qos aces:                          510
  number of IPv6 security aces:                     510
```

This is an example of output from the **show sdm prefer** command when you have configured a new template but have not reloaded the switch:

```
Switch# show sdm prefer
 The current template is "desktop routing" template.
 The selected template optimizes the resources in
 the switch to support this level of features for
 8 routed interfaces and 1024 VLANs.

  number of unicast mac addresses:            3K
  number of igmp groups + multicast routes:   1K
  number of unicast routes:                   11K
    number of directly connected hosts:       3K
    number of indirect routes:                8K
  number of qos aces:                         512
  number of security aces:                    1K

 On next reload, template will be "desktop vlan" template.
```

## Related Commands

| Command | Description |
|---|---|
| sdm prefer | Sets the SDM template to maximize resources for routing or VLANs or to the default template, to select a dual IPv4 and IPv6 template, or to select the desktop or aggregator templates. |

# show setup express

Use the **show setup express** privileged EXEC command to display if Express Setup mode is active on the switch.

**show setup express**

## Syntax Description

This command has no arguments or keywords.

## Defaults

No default is defined.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(14)EA1 | This command was introduced. |

## Examples

This is an example of output from the **show setup express co**mmand:

```
Switch# show setup express
express setup mode is active
```

## Related Commands

| Command | Description |
|---|---|
| setup express | Enables Express Setup mode. |

# show spanning-tree

Use the **show spanning-tree** command in EXEC mode 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*]

**show spanning-tree** *bridge-group* [**active** [**detail**] | **blockedports** | **bridge** | **detail** [**active**] | **inconsistentports** | **interface** *interface-id* | **root** | **summary**]

**show spanning-tree vlan** *vlan-id* [**active** [**detail**] | **blockedports** | **bridge** | **detail** [**active**] | **inconsistentports** | **interface** *interface-id* | **root** | **summary**]

**show spanning-tree** {**vlan** *vlan-id* | *bridge-group*} **bridge** [**address** | **detail** | **forward-time** | **hello-time** | **id** | **max-age** | **priority** [**system-id**] | **protocol**]

**show spanning-tree** {**vlan** *vlan-id* | *bridge-group*} **root** [**address** | **cost** | **detail** | **forward-time** | **hello-time** | **id** | **max-age** | **port** | **priority** [**system-id**]

**show spanning-tree interface** *interface-id* [**active** [**detail**] | **cost** | **detail** [**active**] | **inconsistency** | **portfast** | **priority** | **rootcost** | **state**]

**show spanning-tree mst** [**configuration** [digest]] | [*instance-id* [**detail** | **interface** *interface-id* [**detail**]]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **mst** keyword and options were added. |

## Usage Guidelines

If the *vlan-id* variable is omitted, the command applies to the spanning-tree instance for all VLANs.

## 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 (GigabitEthernet2/0/1)
             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
---------------- ---- --- --------- -------- --------------------------------
Gi2/0/1          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 1 (GigabitEthernet2/0/1), 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 (GigabitEthernet2/0/1) 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 gigabitethernet2/0/1
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 gigabitethernet2/0/1
GigabitEthernet2/0/1 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    Gi1/0/1         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
---------------------  ---- ----- --------- ---- --------------------------------
GigabitEthernet2/0/1   root FWD   200000    128  P2P bound(STP)
GigabitEthernet2/0/2   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. |

| Command | Description |
|---|---|
| **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** command in EXEC mode 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**]

## Syntax Description

| | | |
|---|---|---|
| *interface-id* | **Note** | (Optional) Interface ID for the physical port (including type, stack member, 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
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | 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.

## 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
---------    -------------  ----------  ---------  ---------
Gi1/0/1      Forwarding     20 pps      10 pps     5 pps
Gi1/0/2      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#Switch# show storm-control gigabitethernet 1/0/1
Interface    Filter State   Upper       Lower      Current
---------    -------------  ----------  ---------  ---------
Gi1/0/1      Forwarding     20 pps      10 pps     5 pps
```

Table 2-42 describes the fields in the **show storm-control** display.

*Table 2-42 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 switch

Use the **show switch** command in EXEC mode to display information related to a stack member or the switch stack.

**show switch** [*stack-member-number* | **detail** | **neighbors** | **stack-ports**[**summary**] | **stack-ring activity** [**detail**] | **speed**]

## Syntax Description

| | |
|---|---|
| *stack-member-number* | (Optional) Display information for the specified member. The range is 1 to 9. |
| **detail** | (Optional) Display detailed information about the stack ring. |
| **neighbors** | (Optional) Display the neighbors for the entire stack. |
| **stack-ports** | (Optional) Display port information for the entire stack. |
| **stack-ports** [**summary**] | (Optional) Display the StackWise cable length, the stack link status, and the loopback status. |
| **stack-ring activity** [**detail**] | (Optional) Display the number of frames per member that are sent to the stack ring. Use the **detail** keyword to display the number of frames per member that are sent to the stack ring, the receive queues, and the ASIC. |
| **stack-ring speed** | (Optional) Display the stack ring speed. |
| **\| 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
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The display was expanded to include Switch Database Management (SDM) mismatch. |
| 12.2(20)SE | The display was expanded to include provisioning information. The **stack-ring activity** [**detail**] keywords were added. |
| 12.2(50)SE | The display was expanded to include StackWise cable, link, and loopback information. The **stack ports** [**summary**] keywords were added. |

## Usage Guidelines

This command displays these states:

- Waiting—A switch is booting up and waiting for communication from other switches in the stack. The switch has not yet determined whether or not it is a stack master.

  Stack members not participating in a stack master election remain in the waiting state until the stack master is elected and ready.

- Initializing—A switch has determined whether its stack master status. If it is not the stack master, it is receiving its system- and interface-level configuration from the stack master and loading it.
- Ready—The member has completed loading the system- and interface-level configurations and can forward traffic.
- Master Re-Init—The state immediately after a master re-election and a different member is elected master. The new master is re-initializing its configuration. This state applies only to the new master.
- Ver Mismatch—A switch in version mismatch mode. Version-mismatch mode is when a switch joining the stack has a different stack protocol minor version number than the master.
- SDM Mismatch—A switch in Switch Database Management (SDM) mismatch mode. SDM mismatch is when a member does not support the SDM template running on the master.
- Provisioned—The state of a preconfigured switch before it becomes an active member of a stack, or the state of a member after it has left the stack. The MAC address and the priority number in the display are always 0 for the provisioned switch.

A typical state transition for a member (including a master) booting up is Waiting -> Initializing -> Ready.

A typical state transition for a member becoming a master after a master election is Ready -> Master Re-Init -> Ready.

A typical state transition for a member in version mismatch mode is Waiting -> Ver Mismatch.

You can use the **show switch** command to identify whether the provisioned switch exists in the stack. The **show running-config** and the **show startup-config** privileged EXEC commands do not provide this information.

The display also includes stack MAC-persistency wait-time if persistent MAC address is enabled.

## Examples

This example shows summary stack information:

```
Switch# show switch
                                                    Current
Switch#  Role      Mac Address     Priority     State
-----------------------------------------------------------
 6       Member    0003.e31a.1e00     1         Ready
*8       Master    0003.e31a.1200     1         Ready
 2       Member    0000.000.0000      0         Provisioned
```

This example shows detailed stack information:

```
Switch# show switch detail
Switch/Stack Mac Address : 0013.c4db.7e00
Mac persistency wait time: 4 mins
                                               H/W   Current
Switch#  Role   Mac Address     Priority Version  State
-----------------------------------------------------------
*1       Master 0013.c4db.7e00     1      0       Ready
 2       Member 0000.000.0000      0      0       Provisioned
 6       Member 0003.e31a.1e00     1      0       Ready


         Stack Port Status             Neighbors
Switch#  Port 1     Port 2           Port 1   Port 2
-----------------------------------------------------------
  1       Ok        Down               6        None
  6       Down      Ok                 None       1
```

This example shows the member 6 summary information:

```
Switch# show switch 6
                                                     Current
Switch#  Role      Mac Address     Priority     State
-----------------------------------------------------------
 6       Member     0003.e31a.1e00     1          Ready
```

This example shows the neighbor information for a stack:

```
Switch# show switch neighbors
  Switch #    Port A       Port B
  --------    ------       ------
      6         None          8
      8          6            None
```

This example shows stack-port information:

```
Switch# show switch stack-ports
  Switch #    Port A       Port B
  --------    ------       ------
     6          Down         Ok
     8           Ok          Down
```

Table 2-43 shows the output for the **show switch stack-ports summary** command.

```
Switch# show switch stack-ports summary
Switch#/  Stack   Neighbor   Cable    Link   Link   Sync      #          In
 Port#     Port              Length    OK   Active   OK    Changes   Loopback
           Status                                          To LinkOK
--------  ------  --------  --------  ----  ------  ----  ---------  --------
  1/1     Down       2       50 cm     No     NO      No       10         No
  1/2     Ok         3       1 m       Yes    Yes     Yes      0          No
  2/1     Ok         5       3 m       Yes    Yes     Yes      0          No
  2/2     Down       1       50 cm     No     No      No       10         No
  3/1     Ok         1       1 m       Yes    Yes     Yes      0          No
  3/2     Ok         5       1 m       Yes    Yes     Yes      0          No
  5/1     Ok         3       1 m       Yes    Yes     Yes      0          No
  5/2     Ok         2       3 m       Yes    Yes     Yes      0          No
```

***Table 2-43 show switch stack-ports summary Command Output***

| Field | Description |
|---|---|
| Switch#/Port# | Member number and its StackWise port number. |
| Stack Port Status | • Absent—No cable is detected on the StackWise port.<br>• Down—A cable is detected, but either no connected neighbor is up, or the StackWise port is disabled.<br>• OK—A cable is detected, and the connected neighbor is up. |
| Neighbor | Switch number of the active member at the other end of the StackWise cable. |
| Cable Length | Valid lengths are 50 cm, 1 m, or 3 m.<br>If the switch cannot detect the cable length, the value is *no cable*. The cable might not be connected, or the link might be unreliable. |

*Table 2-43 show switch stack-ports summary Command Output (continued)*

| Field | Description |
|---|---|
| Link OK | This shows if the link is stable.<br>The *link partner* is a StackWise port on a neighbor switch.<br>• No—The link partner receives invalid protocol messages from the port.<br>• Yes—The link partner receives valid protocol messages from the port. |
| Link Active | This shows if the StackWise port is in the same state as its link partner.<br>• No—The port cannot send traffic to the link partner.<br>• Yes—The port can send traffic to the link partner. |
| Sync OK | • No—The link partner does not send valid protocol messages to the StackWise port.<br>• Yes—The link partner sends valid protocol messages to the port. |
| # Changes to LinkOK | This shows the relative stability of the link.<br>If a large number of changes occur in a short period of time, link flapping can occur. |
| In Loopback | • No— At least one StackWise port on the member has an attached StackWise cable.<br>• Yes—None of the StackWise ports on the member has an attached StackWise cable. |

This example shows detailed stack-ring activity information:

```
Switch# show switch stack-ring activity detail
Switch   Asic  Rx Queue-1  Rx Queue-2  Rx Queue-3  Rx Queue-4       Total
---------------------------------------------------------------------------
1           0     2021864     1228937      281510           0     3532311
1           1          52           0       72678           0       72730
                                          ---------------------------
                                          Switch 1 Total:     3605041
---------------------------------------------------------------------------
2           0     2020901       90833      101680           0     2213414
2           1          52           0           0           0          52
                                          ---------------------------
                                          Switch 2 Total:     2213466
---------------------------------------------------------------------------

Total frames sent to stack ring : 5818507

Note: these counts do not include frames sent to the ring
by certain output features, such as output SPAN and output
ACLs.
```

## Related Commands

| Command | Description |
|---|---|
| **reload** | Reloads the member and puts a configuration change into effect. |
| **remote command** | Monitors all or specified members. |
| **session** | Accesses a specific member. |
| **switch** | Changes the member priority value. |
| **switch provision** | Provisions a new switch before it joins the stack. |
| **switch renumber** | Changes the member number. |

# 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**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

If you have used the **system mtu** or **system mtu jumbo** global configuration command to change the MTU setting, the new setting does not take effect until you reset the switch.

The system MTU refers to ports operating at 10/100 Mb/s; the system jumbo MTU refers to Gigabit ports; the system routing MTU refers to routed ports.

## Examples

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

```
Switch# show system mtu
System MTU size is 1500 bytes
System Jumbo MTU size is 1550 bytes
Routing MTU size is 1500 bytes.
```

## Related Commands

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

# show udld

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

**show udld** [*interface-id*]

## 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. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## Usage Guidelines

If you do not enter an *interface-id*, administrative and operational UDLD status for all interfaces 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 2-44 describes the fields in this display.

```
Switch# show udld gigabitethernet2/0/1
Interface gi2/0/1
---
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: Gi2/0/1
    Neighbor echo 1 device: Switch-B
    Neighbor echo 1 port: Gi2/0/2
    Message interval: 5
    CDP Device name: Switch-A
```

*Table 2-44 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** command in EXEC mode to display version information for the hardware and firmware.

**show version**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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 Internetwork Operating System Software
IOS (tm) C3750 Software (C3750-IPSERVICES-M), Version 12.2(25)SEB, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Tues 15-Feb-05 21:09 by antonino
Image text-base: 0x00003000, data-base: 0x008E36A4

ROM: Bootstrap program is C3750 boot loader
BOOTLDR: C3750 Boot Loader (C3750-HBOOT-M) Version 12.2(25)SEB,

Switch uptime is 2 days, 11 hours, 16 minutes
System returned to ROM by power-on
System image file is "flash:i5.709"

cisco WS-C3750-48TS (PowerPC405) processor with 120822K/10240K bytes of memory.
Last reset from power-on
Bridging software.
Target IOS Version 12.2(25)SEB
1 Virtual Ethernet/IEEE 802.3  interface(s)
48 FastEthernet/IEEE 802.3 interface(s)
32 Gigabit Ethernet/IEEE 802.3 interface(s)
The password-recovery mechanism is enabled.

512K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address       : 00:09:43:A7:F2:00
Motherboard assembly number     : 73-7056-05
Motherboard serial number       : CSJ0638004U
Motherboard revision number     : 05
Model number                    : 73-7056-05
```

```
Switch   Ports  Model              SW Version            SW Image
------   -----  -----              ----------            ----------
     1   28     WS-C3750G-24TS     12.2(25)SEB           C3750-IPSERVICES-M
*    8   52     WS-C3750-48TS      12.2(25)SEB           C3750-IPSERVICES-M


Switch 01
---------

Switch Uptime                   : 2 days, 11 hours, 17 minutes
Base ethernet MAC Address       : 00:0B:46:2E:35:80
Motherboard assembly number     : 73-7058-04
Power supply part number        : 341-0045-01
Motherboard serial number       : CSJ0640010L
Model number                    : WS-C3750-24TS-SMI
System serial number            : CSJ0642U00A

Configuration register is 0xF

<output truncated>
```

# show vlan

Use the **show vlan** command in EXEC mode to display the parameters for all configured VLANs or one VLAN (if the VLAN ID or name is specified) on the switch.

**show vlan** [**brief** | **dot1q tag native** | **id** *vlan-id* | **internal usage** | **mtu** | **name** *vlan-name* | **private-vlan** [**type**] | **remote-span** | **summary**]

## Syntax Description

| | |
|---|---|
| **brief** | (Optional) Display one line for each VLAN with the VLAN name, status, and its ports. |
| **dot1q tag native** | (Optional) Display the IEEE 802.1Q native VLAN tagging status. |
| **id** *vlan-id* | (Optional) Display information about a single VLAN identified by VLAN ID number. For *vlan-id*, the range is 1 to 4094. |
| **internal usage** | (Optional) Display a list of VLANs being used internally by the switch. These VLANs are always from the extended range (VLAN IDs 1006 to 4094), and you cannot create VLANs with these IDS by using the **vlan** global configuration command until you remove them from internal use. |
| **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. |
| **private-vlan** | (Optional) Display information about configured private VLANs, including primary and secondary VLAN IDs, type (community, isolated, or primary) and ports belonging to the private VLAN. This keyword is only supported if your switch is running the IP services image. |
| **type** | (Optional) Display only private VLAN ID and type. |
| **remote-span** | (Optional) Display information about Remote SPAN (RSPAN) VLANs. |
| **summary** | (Optional) Display VLAN summary information. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.2(20)SE | The **mtu** and **private-vlan** keywords were added. |
| 12.2(25)SE | The **dot1q tag native** keywords were added. |

## Usage Guidelines

In the **show vlan mtu** command output, the MTU_Mismatch column shows whether all the ports in the VLAN have the same MTU. When *yes* appears in this column, it means that the VLAN has ports with different MTUs, and packets that are switched from a port with a larger MTU to a port with a smaller MTU might be dropped. If the VLAN does not have an SVI, the hyphen (-) symbol appears in the SVI_MTU column. If the MTU-Mismatch column displays *yes*, the names of the port with the MinMTU and the port with the MaxMTU appear.

If you try to associate a private VLAN secondary VLAN with a primary VLAN before you define the secondary VLAN, the secondary VLAN is not included in the **show vlan private-vlan** command output.

In the **show vlan private-vlan type** command output, a type displayed as *normal* means a VLAN that has a private VLAN association but is not part of the private VLAN. For example, if you define and associate two VLANs as primary and secondary VLANs and then delete the secondary VLAN configuration without removing the association from the primary VLAN, the VLAN that was the secondary VLAN is shown as *normal* in the display. In the **show vlan private-vlan** output, the primary and secondary VLAN pair is shown as *non-operational*.

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

## Examples

This is an example of output from the **show vlan** command. Table 2-45 describes the fields in the display.

```
Switch# show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa1/0/1, Fa1/0/2, Fa1/0/3
                                                Fa1/0/4, Fa1/0/5, Fa1/0/6
                                                Fa1/0/7, Fa1/0/8, Fa1/0/9
                                                Fa1/0/10, Fa1/0/11, Fa1/0/12
                                                Fa1/0/13, Fa1/0/14, Fa1/0/15
                                                Fa1/0/16, Fa1/0/17, Fa1/0/18
                                                Fa1/0/19, Fa1/0/20, Fa1/0/21
                                                Fa1/0/24, Gi1/0/1, Gi1/0/2
<output truncated>

2    VLAN0002                         active
3    VLAN0003                         active

<output truncated>

1000 VLAN1000                         active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        1002   1003
2    enet  100002     1500  -      -      -        -    -        0      0
3    enet  100003     1500  -      -      -        -    -        0      0

<output truncated>

1005 trnet 101005     1500  -      -      -        ibm  -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------

Primary Secondary Type Ports
------- --------- ----------------- ------------------------------------------
20      25     isolated  Fa1/0/13, Fa1/0/20, Fa1/0/22, Gi1/0/1, Fa2/0/13, Fa2/0/22,
                         Fa3/0/13, Fa3/0/14. Fa3/0/20, Gi3/0/1
```

```
20      30     community Fa1/0/13, Fa1/0/20, Fa1/0/21, Gi1/0/1, Fa2/0/13, Fa2/0/20,
                         Fa3/0/14, Fa3/0/20,Fa3/0/21, Gi3/0/1
20      35     community Fa1/0/13, Fa1/0/20, Fa1/0/23, Fa1/0/33, Gi1/0/1, Fa2/0/13,
                         Fa3/0/14, Fa3/0/20, Fa3/0/23, Fa3/0/33, Gi3/0/1

<output truncated>
```

***Table 2-45 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. |
| RingNo | Ring number for the VLAN, if applicable. |
| BrdgNo | Bridge number for the VLAN, if applicable. |
| Stp | Spanning Tree Protocol type used on the VLAN. |
| BrdgMode | Bridging mode for this VLAN—possible values are source-route bridging (SRB) and source-route transparent (SRT); the default is SRB. |
| Trans1 | Translation bridge 1. |
| Trans2 | Translation bridge 2. |
| Remote SPAN VLANs | Identifies any RSPAN VLANs that have been configured. |
| Primary/Secondary/ Type/Ports | Includes any private VLANs that have been configured, including the primary VLAN ID, the secondary VLAN ID, the type of secondary VLAN (community or isolated), and the ports that belong to it. |

This is an example of output from the **show vlan dot1q tag native** command:

```
Switch# show vlan dot1q tag native
dot1q native vlan tagging is disabled
```

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

```
Switch# show vlan private-vlan
Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
10      501       isolated          Gi3/0/3
10      502       community         Fa2/0/11
10      503       non-operational3      -
20       25       isolated          Fa1/0/13, Fa1/1/0/22, Gi1/0/1, Fa2/0/13,
                                   Fa2/0/22, Fa3/0/13, Fa3/0/14, Fa3/0/20, Gi3/0/1
20       30       community         Fa1/0/13, Fa1/0/20, Fa1/0/21, Gi1/0/1, Fa2/0/13,
                                   Fa2/0/20, Fa3/0/14, Fa3/0/20, Fa3/0/21, Gi3/0/1
20       35       community         Fa1/0/13, Fa1/0/20, Fa1/0/23, Fa1/0/33. Gi1/0/1,
                                   Fa2/0/13, Fa3/0/14, Fa3/0/20. Fa3/0/23, Fa3/0/33,
                                   Gi3/0/1
20       55       non-operational
2000   2500       isolated          Fa1/0/5, Fa1/0/10, Fa2/0/5, Fa2/0/10, Fa2/0/15
```

This is an example of output from the **show vlan private-vlan type** command:

```
Switch# show vlan private-vlan type
Vlan Type
---- -----------------
10   primary
501  isolated
502  community
503  normal
```

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

```
Switch# show vlan summary
Number of existing VLANs           : 45
 Number of existing VTP VLANs      : 45
 Number of existing extended VLANs : 0
```

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

```
Switch# show vlan id 2
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
2    VLAN0200                         active    Fa1/0/7, Fa1/0/8

2    VLAN0200                        active    Fa1/3, Fa2/5, Fa2/6
VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
2    enet  100002     1500  -      -      -        -    -        0      0

Remote SPAN VLAN
----------------
Disabled
```

This is an example of output from the **show vlan internal usage** command. It shows that VLANs 1025 and 1026 are being used as internal VLANs for Fast Ethernet routed ports 23 and 24 on stack member 1. If you want to use one of these VLAN IDs, you must first shut down the routed port, which releases the internal VLAN, and then create the extended-range VLAN. When you start up the routed port, another internal VLAN number is assigned to it.

```
Switch# show vlan internal usage
VLAN Usage
---- -------------
1025 FastEthernet1/0/23
1026 FastEthernet1/0/24
```

## Related Commands

| Command | Description |
|---|---|
| **private-vlan** | Configures a VLAN as a community, isolated, or primary VLAN or associates a primary VLAN with secondary VLANs. |
| **switchport mode** | Configures the VLAN membership mode of a port. |
| **usb-inactivity-timeout** | Enables VLAN configuration mode where you can configure VLANs 1 to 4094. |

# 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*]

## Syntax Description

| | |
|---|---|
| *mapname* | (Optional) Name of a specific VLAN access map. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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*]

## 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. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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** command in EXEC mode 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**]

## Syntax Description

| | |
|---|---|
| **statistics** | (Optional) Display VQP client-side statistics and counters. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |

## 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 2-46 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 2-46 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** command in EXEC mode to display general information about the VLAN Trunking Protocol (VTP) management domain, status, and counters.

**show vtp** {**counters** | **devices** [**conflicts**] | **interface** [*interface-id*] | **password** | **status**}

## Syntax Description

| | |
|---|---|
| **counters** | Display the VTP statistics for the switch. |
| **password** | Display the configured VTP password. |
| **devices** | Display information about all VTP version 3 devices in the domain. This keyword applies only if the switch is not running VTP version 3. |
| **conflicts** | (Optional) Display information about VTP version 3 devices that have conflicting primary servers. This command is ignored when the switch is in VTP transparent or VPT off mode. |
| **interface** [*interface-id*] | Display VTP status and configuration for all interfaces or the specified interface. The *interface-id* can be a physical interface or a port channel. |
| **status** | Display general information about the VTP management domain status. |

## Command Modes

User EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(11)AX | This command was introduced. |
| 12.1(14)EA1 | The **password** keyword was added. |
| 12.2(52)SE | The **devices** and **interface** keywords were added for VTP version 3. |

## Usage Guidelines

When you enter the **show vtp password** command when the switch is running VTP version 3, the display follows these rules:

- If the **password** *password* global configuration command did not specify the **hidden** keyword and encryption is not enabled on the switch, the password appears in clear text.
- If the **password** *password* command did not specify the **hidden** keyword and encryption is enabled on the switch, the encrypted password appears.
- If the **password** *password* command included the **hidden** keyword, the hexadecimal secret key is displayed.

## Examples

This is an example of output from the **show vtp devices** command. A `Yes` in the *`Conflict`* column means that the responding server is in conflict with the local server for the feature; that is, when two switches in the same domain do not have the same primary server for a database.

```
Switch# show vtp devices

Retrieving information from the VTP domain. Waiting for 5 seconds.
VTP Database Conf switch ID      Primary Server Revision   System Name
```

```
             lict
------------ ---- -------------- -------------- ---------- ----------------------
VLAN         Yes  00b0.8e50.d000 000c.0412.6300 12354      main.cisco.com
MST          No   00b0.8e50.d000 0004.AB45.6000 24         main.cisco.com
VLAN         Yes  000c.0412.6300=000c.0412.6300 67         qwerty.cisco.com
```

This is an example of output from the **show vtp counters** command. Table 2-47 describes the fields in the display.

```
Switch# show vtp counters

VTP statistics:
Summary advertisements received    : 0
Subset advertisements received     : 0
Request advertisements received    : 0
Summary advertisements transmitted : 6970
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
---------------- ---------------- ---------------- ---------------------------
Fa1/0/47            0                0                0
Fa1/0/48            0                0                0
Gi2/0/1            0                0                0
Gi3/0/2             0                0                0
```

***Table 2-47 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. |

*Table 2-47 show vtp counters Field Descriptions (continued)*

| Field | Description |
|---|---|
| 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. |
| 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 for a switch running VTP version 2. Table 2-48 describes the fields 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 2-48 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. |
| VTP Operating Mode | Displays the VTP operating mode, which can be server, client, or transparent.<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>**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>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>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. |

This is an example of output from the **show vtp status** command for a switch running VTP version 3. .

```
Switch# show vtp status
VTP Version capable             : 1 to 3
VTP version running             : 3
VTP Domain Name                 : Cisco
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0021.1bcd.c700
```

```
Feature VLAN:
--------------
VTP Operating Mode                : Server
Number of existing VLANs          : 7
Number of existing extended VLANs : 0
Configuration Revision            : 0
Primary ID                        : 0000.0000.0000
Primary Description               :
MD5 digest                        : 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                                    0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
Feature MST:
--------------
VTP Operating Mode                : Client
Configuration Revision            : 0
Primary ID                        : 0000.0000.0000
Primary Description               :
MD5 digest                        : 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                                    0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00

Feature UNKNOWN:
--------------
VTP Operating Mode                : Transparent
```

## 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. |