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.
		For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 > System Management Commands > RMON Commands.**

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. • **default**—Provide balance to IPv4 and IPv6 Layer 2 and Layer 3 functionality. • **routing**—Provide maximum system usage for IPv4 and IPv6 routing, including IPv4 policy-based routing. • **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.
	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 2-17 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 2-17   **Approximate Number of Feature Resources Allowed by IPv4Templates**

Resource	Desktop Templates				Aggregator Templates			
	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 2-18 lists the approximate number of each resource supported in each of the dual IPv4-and IPv6 templates for a desktop or aggregator switch.

Table 2-18   **Approximate Feature Resources Allowed by Dual IPv4-IPv6 Templates**

Resource	Desktop IPv4-and-IPv6 Templates			Aggregator IPv4-and-IPv6 Templates		
	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

Table 2-18   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 policy-based routing ACEs	0	256	0	0	512	0
IPv4 or MAC QoS ACEs (total)	512	512	512	876	896	876
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 gigabitethernet2/0/2
Switch(config-if)# no service-policy input plcmap2
```

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

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

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

```
Switch> enable
Switch# 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. For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 > File Management Commands > Configuration File Management Commands**.

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.
	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*.
	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.

■ **set**

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.
```

Catalyst 3750 Switch Command Reference

■ **setup**

```
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. For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 > File Management Commands > Configuration File Management Commands**.
	show version	Displays version information for the hardware and firmware.

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.

shell trigger

Use the **shell trigger** global configuration command to create an event trigger. Use the **no** form of this command to delete the trigger.

> **shell trigger** *identifier description*

> **no shell trigger** *identifier description*

Syntax Description	

identifier	Specify the event trigger identifier. The identifier should have no spaces or hyphens between words.
description	Specify the event trigger description text.

Defaults   There are system-defined event triggers:

- CISCO_PHONE_EVENT
- CISCO_SWITCH_EVENT
- CISCO_ROUTER_EVENT
- CISCO_WIRELESS_AP_EVENT
- CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT

Command Modes   Global configuration

Command History

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

Usage Guidelines   Use this command to create user-defined event triggers for use with the **macro auto execute** global configuration command.

To support dynamic device discovery when using 802.1x authentication, configure the RADIUS authentication server to support the Cisco attribute-value (av) pair: **auto-smart-port=***event trigger*

Examples   This example shows how to create a user-defined event trigger called RADIUS_MAB_EVENT:

```
Switch# configure terminal
Switch(config)# shell trigger RADIUS_MAB_EVENT MAC_AuthBypass Event
Switch(config)# end
```

Related Commands	Command	Description
	macro auto global processing	Enables Auto Smartports on a switch.
	macro auto execute	Configure mapping from an event trigger to a built-in macro.
	show shell	Displays information about event triggers and macros.

show access-lists

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

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

Syntax Description

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

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

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

```
Switch# show access-lists
Standard IP access list 1
    10 permit 1.1.1.1
    20 permit 2.2.2.2
    30 permit any
    40 permit 0.255.255.255, wildcard bits 12.0.0.0
Standard IP access list videowizard_1-1-1-1
    10 permit 1.1.1.1
Standard IP access list videowizard_10-10-10-10
    10 permit 10.10.10.10
Extended IP access list 121
    10 permit ahp host 10.10.10.10 host 20.20.10.10 precedence routine
Extended IP access list CMP-NAT-ACL
    Dynamic Cluster-HSRP deny   ip any any
    10 deny ip any host 19.19.11.11
    20 deny ip any host 10.11.12.13
    Dynamic Cluster-NAT permit ip any any
    10 permit ip host 10.99.100.128 any
    20 permit ip host 10.46.22.128 any
    30 permit ip host 10.45.101.64 any
    40 permit ip host 10.45.20.64 any
    50 permit ip host 10.213.43.128 any
    60 permit ip host 10.91.28.64 any
    70 permit ip host 10.99.75.128 any
    80 permit ip host 10.38.49.0 any
```

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

```
Switch# show access-lists hardware counters
L2 ACL INPUT Statistics
    Drop:               All frame count: 855
    Drop:               All bytes count: 94143
    Drop And Log:       All frame count: 0
    Drop And Log:       All bytes count: 0
    Bridge Only:        All frame count: 0
    Bridge Only:        All bytes count: 0
    Bridge Only And Log: All frame count: 0
    Bridge Only And Log: All bytes count: 0
    Forwarding To CPU:  All frame count: 0
    Forwarding To CPU:  All bytes count: 0
    Forwarded:          All frame count: 2121
    Forwarded:          All bytes count: 180762
    Forwarded And Log:  All frame count: 0
    Forwarded And Log:  All bytes count: 0

 L3 ACL INPUT Statistics
    Drop:               All frame count: 0
    Drop:               All bytes count: 0
    Drop And Log:       All frame count: 0
    Drop And Log:       All bytes count: 0
    Bridge Only:        All frame count: 0
    Bridge Only:        All bytes count: 0
    Bridge Only And Log: All frame count: 0
    Bridge Only And Log: All bytes count: 0
    Forwarding To CPU:  All frame count: 0
    Forwarding To CPU:  All bytes count: 0
    Forwarded:          All frame count: 13586
    Forwarded:          All bytes count: 1236182
    Forwarded And Log:  All frame count: 0
    Forwarded And Log:  All bytes count: 0
```

```
L2 ACL OUTPUT Statistics
    Drop:               All frame count: 0
    Drop:               All bytes count: 0
    Drop And Log:       All frame count: 0
    Drop And Log:       All bytes count: 0
    Bridge Only:        All frame count: 0
    Bridge Only:        All bytes count: 0
    Bridge Only And Log: All frame count: 0
    Bridge Only And Log: All bytes count: 0
    Forwarding To CPU:  All frame count: 0
    Forwarding To CPU:  All bytes count: 0
    Forwarded:          All frame count: 232983
    Forwarded:          All bytes count: 16825661
    Forwarded And Log:  All frame count: 0
    Forwarded And Log:  All bytes count: 0

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

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

show archive status

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

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

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

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.2(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.

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

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

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

Switch# show archive status
LOADING: Upgrade in progress

Switch# show archive status
EXTRACT: Extracting the image

Switch# show archive status
VERIFY: Verifying software

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

Related Commands	Command	Description
	archive download-sw	Downloads a new image from a TFTP server to the switch.

show arp access-list

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

show arp access-list [*acl-name*] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show 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** command (in either user EXEC or privileged EXEC mode) to display information about authentication manager events on the switch.

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

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC and User EXEC

Command History

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

Usage Guidelines   Table 2-19 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 2-19   show authentication Command Output

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

Table 2-19   show authentication Command Output (continued)

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

Table 2-20 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 2-20   State Method Values

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

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

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

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

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

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

```
Switch# show authentication sessions
Interface   MAC Address     Method    Domain    Status         Session ID
Gi3/45      (unknown)       N/A       DATA      Authz Failed   09081404000000007003651EC
Gi3/46      (unknown)       N/A       DATA      Authz Success  09081404000000080057C274
```

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

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

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

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

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

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

Related Commands

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

Command	Description
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

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

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

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.1(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 [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   Privileged EXEC

Command History

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

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

Examples   This is an example of output from the **show boot** command for all stack members. Table 2-21 describes each field in the display.

```
Switch# show boot
BOOT path-list       :flash:/c3750-ipservices-mz
Config file          :flash:/config.text
Private Config file  :flash:/private-config.text
Enable Break         :no
Manual Boot          :yes
HELPER path-list     :
Auto upgrade         :yes
------------------
Switch 1
------------------
BOOT path-list       :flash:/c3750-ipservices-mz
Config file          :flash:/config.text
Private Config file  :flash:/private-config.text
Enable Break         :no
Manual Boot          :yes
HELPER path-list     :

Auto upgrade         :no

<output truncated>
```

Table 2-21   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.
	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.
	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.
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.
	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* [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

interface-id	Specify the interface on which TDR was run.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show 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 2-22 lists the descriptions of the fields in the **show cable-diagnostics tdr** command output.

Table 2-22   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: • The cable is properly connected, the link is up, and the interface speed is 1000 Mb/s. • The cable is open. • 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: • Normal—The pair of wires is properly connected. • Not completed—The test is running and is not completed. • Not supported—The interface does not support TDR. • Open—The pair of wires is open. • Shorted—The pair of wires is shorted. • ImpedanceMis—The impedance is mismatched. • Short/Impedance Mismatched—The impedance mismatched or the cable is short. • 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 gigabitethernet1/0/2
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 gigabitethernet1/0/2
% 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 cisp

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

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

Syntax Description		
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	
| 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 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** user EXEC command to display quality of service (QoS) class maps, which define the match criteria to classify traffic.

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

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

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

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

Related Commands

Command	Description
class-map	Creates a class map to be used for matching packets to the class whose name you specify.
match (class-map configuration)	Defines the match criteria to classify traffic.

show cluster

Use the **show cluster** user 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 [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes

User EXEC

Command History

Release	Modification
12.1(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.

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

Examples

This is an example of output when the **show cluster** command is entered on the active 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** privileged EXEC command to display a list of candidate switches.

show cluster candidates [**detail** | **mac-address** *H.H.H.*] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

detail	(Optional) Display detailed information for all candidates.
mac-address *H.H.H.*	(Optional) MAC address of the cluster candidate.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show 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**] [**|** {**begin** | **exclude** | **include**} *expression*]

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show 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 [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   Privileged EXEC

Command History

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

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

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

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

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

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

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

<output truncated>

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

<output truncated>

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

<output truncated>
```

Related Commands

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

show controllers ethernet-controller

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

> **show controllers ethernet-controller** [*interface-id*] [**phy** [**detail**]] [**port-asic** {**configuration** | **statistics**}] [**fastethernet 0**][| {**begin** | **exclude** | **include**} *expression*]

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

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

Command History

Release	Modification
12.1(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.

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

Examples

This is an example of output from the **show controllers ethernet-controller** command for an interface. Table 2-23 describes the *Transmit* fields, and Table 2-24 describes 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 2-23   Transmit Field Descriptions

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

Table 2-23   Transmit Field Descriptions (continued)

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

1.   CFI = Canonical Format Indicator

Table 2-24   Receive Field Descriptions

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

Table 2-24   Receive Field Descriptions (continued)

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

Table 2-24   Receive Field Descriptions (continued)

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

1. FCS = frame check sequence

2. MTU = maximum transmission unit

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

```
Switch# show controllers ethernet-controller 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 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** user EXEC command to display the values in the registers of the specified Power over Ethernet (PoE) controller.

> **show controllers power inline** [*instance*] [**module** *switch-number*] [| {**begin** | **exclude** | **include**} *expression*]

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*	(Optional) Limit the display to ports on the specified stack member. The switch number is 1 to 9.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show controllers 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
 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
 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
 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**] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

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

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

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

```
HRR0:    00000000_E000CAFC
HRR1:    00000000_00000000
HRR2:    00000000_00000000
HRR3:    00000000_00000000
HRR4:    00000000_00000000
HRR5:    00000000_00000000
HRR6:    00000000_00000000
HRR7:    00000000_00000000
<output truncated>

GMR31:  FF_FFFFFFFF_FFFFFFFF
GMR32:  FF_FFFFFFFF_FFFFFFFF
GMR33:  FF_FFFFFFFF_FFFFFFFF


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

Related Commands	Command	Description
	show controllers cpu-interface	Displays the state of the CPU network ASIC and send and receive statistics for packets reaching the CPU.
	show controllers ethernet-controller	Displays per-interface send and receive statistics read from the hardware or the interface internal registers.

show controllers utilization

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

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show 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 2-25   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** user EXEC command to view the test results of the online diagnostics and to list the supported test suites.

show diagnostic content switch [*num* | **all**] [| {**begin** | **exclude** | **include**} *expression*]

show diagnostic post [{**begin** | **exclude** | **include**} *expression*]

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

show diagnostic schedule switch [*num* | **all**] [| {**begin** | **exclude** | **include**} *expression*]

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

show diagnostic switch [*num* | **all**] [**detail**] [| {**begin** | **exclude** | **include**} *expression*]

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.
|**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.

Defaults   This command has no default settings.

Command Modes   User 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:

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 arp inspection log	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** user EXEC command to display information about IEEE 802.1Q tunnel ports.

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

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

Command Modes

User EXEC

Command History

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

Usage Guidelines

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

Examples

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

```
Switch> show dot1q-tunnel
dot1q-tunnel mode LAN Port(s)
-----------------------------
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** user EXEC command to display IEEE 802.1x statistics, administrative status, and operational status for the switch or for the specified port.

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

Syntax Description

all [**summary**]	(Optional) Display the IEEE 802.1x status for all ports.
interface *interface-id*	(Optional) Display the IEEE 802.1x status for the specified port (including type, 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.
	begin	(Optional) Display begins with the line that matches the *expression*.
	exclude	(Optional) Display excludes lines that match the *expression*.
	include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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)
```

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

Examples

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

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

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

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

Dot1x Info for 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** user EXEC 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* user EXEC 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** user EXEC 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.

```
LOTR# 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 2-26 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 2-26   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.

Table 2-26   show dot1x statistics Field Descriptions (continued)

Field	Description
TxTotal	Number of Extensible Authentication Protocol over LAN (EAPOL) frames of any type that have been sent.
RxVersion	Number of received packets in the IEEE 802.1x Version 1 format.
LastRxSrcMac	Source MAC address carried in the most recently received EAPOL frame.

Related Commands

Command	Description
dot1x default	Resets the IEEE 802.1x parameters to their default values.

show dtp

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

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

Syntax Description

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

Command Modes User EXEC

Command History

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

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

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

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

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

```
Switch# show dtp interface 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*] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   Privileged EXEC

Command History

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

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

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

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

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

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

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

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

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

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

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

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

```
Switch> show eap sessions
Role:                   Authenticator   Decision:           Fail
Lower layer:            Dot1x-AuthenticaInterface:          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 energywise

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

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

Syntax Description

categories	(Optional) Display the power levels.
children	(Optional) Display the status of the entity and the PoE ports.
domain	(Optional) Display the domain to which the entity belongs.
events	(Optional) Displays the last ten events (messages) sent to other entities in the domain.
level [**children** | **current** [**children**] | **delta** | **delta children**]	(Optional) Display the available power levels. • **children**—Available power levels for the entity and the PoE ports. • **current**—Current power levels for the entity. (Optional) **children**—Current power levels for the entity and the PoE ports. • **delta**—Difference between the current and available power levels for the entity. (Optional) **children**—Difference between the current and available power levels for the entity and the PoE ports.
neighbors	(Optional) Display the neighbor table for the domain to which the entity belongs.
recurrence	(Optional) Display the EnergyWise settings and status for recurrence.
statistics	(Optional) Display the counters for events and errors.
usage [**children**]	(Optional) Display the available power for the entity. • **children—**Display the available power for the PoE ports.
version	(Optional) Display the EnergyWise version.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

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

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

Examples

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

Switch# show energywise children
Interface   Role            Name              Usage      Lvl   Imp  Type
---------   ----            ----              -----      ---   ---  ----
            Switch          lobby.1           558.0 (W)  10    1    parent
Gi1/0/1     interface       Gi1.0.1           0.0   (W)  1     1    child
Gi1/0/2     interface       Gi1.0.2           0.0   (W)  1     1    child
Gi1/0/3     interface       Gi1.0.3           0.0   (W)  1     1    child
Gi1/0/4     interface       Gi1.0.4           0.0   (W)  1     1    child
Gi1/0/5     interface       Gi1.0.5           0.0   (W)  1     1    child
Gi1/0/6     interface       Gi1.0.6           0.0   (W)  1     1    child
<output truncated>

Switch# show energywise domain
Name      : TG3560G-41
Domain    : cisco
Protocol  : udp
IP        : 2.2.2.21
Port      : 43440

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

```
Switch# show energywise level
                                            Levels (Watts)
Interface  Name            0    1     2     3     4     5     6     7     8     9     10
---------  ----            ------------------------------------------------------------
           lobby.1         0.0  558.0 558.0 558.0 558.0 558.0 558.0 558.0 558.0 558.0 558.0


Switch# show energywise level children
                                            Levels (Watts)
Interface  Name            0    1     2     3     4     5     6     7     8     9     10
---------  ----            ------------------------------------------------------------
           lobby.1         0.0  558.0 558.0 558.0 558.0 558.0 558.0 558.0 558.0 558.0 558.0
Gi1/0/1    Gi1.0.1         0.0  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/2    Gi1.0.2         0.0  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/3    Gi1.0.3         0.0  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/4    Gi1.0.4         0.0  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/5    Gi1.0.5         0.0  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/1    Gi1.0.1         0.0  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
<output truncated>
```

■ **show energywise**

```
Switch# show energywise level current
Interface   Name                   Level  Value
---------   ----                   -----  -----
            lobby.1                10     558.0 (W)

Switch# show energywise level current children
Interface   Name                   Level  Value
---------   ----                   -----  -----
            lobby.1                10     558.0 (W)
Gi1/0/1     Gi1.0.1                1      15.4  (W)
Gi1/0/2     Gi1.0.2                1      15.4  (W)
Gi1/0/3     Gi1.0.3                1      15.4  (W)
Gi1/0/4     Gi1.0.4                1      15.4  (W)
Gi1/0/5     Gi1.0.5                1      15.4  (W)
<output truncated>
```

```
Switch# show energywise level delta
                                                 Levels (Watts)
Interface   Name                 0     1     2     3     4     5     6     7     8     9     10
---------   ----                 ---------------------------------------------------------------------
            lobby.1              -558.0 0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

Switch# show energywise level delta child
                                                 Levels (Watts)
Interface   Name                 0     1     2     3     4     5     6     7     8     9     10
---------   ----                 ---------------------------------------------------------------------
            lobby.1              -558.0 0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
Gi1/0/1     Gi1.0.1              0.0    15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/2     Gi1.0.2              0.0    15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/3     Gi1.0.3              0.0    15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
Gi1/0/4     Gi1.0.4              0.0    15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4  15.4
<output truncated>
```

```
Switch# show energywise neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Id    Neighbor Name              Ip:Port                 Prot   Capability
--    -------------              -------                 ----   ----------
1     Switch.A                   2.2.2.29:43440          udp    S I
5     Switch.B                   2.2.2.22:43440          udp    S I
7     Switch.C                   2,2,2,33:43440          cdp    S I

Switch# show energywise recurrences
Id    Addr        Class Action Lvl Cron
--    ----        ----- ------ --- ----
2     Gi1/0/17    QUERY SET     3   minutes: 0 hour: 8 day: * month: * weekday: *
3     Gi1/0/18    QUERY SET     3   minutes: 0 hour: 8 day: * month: * weekday: *
4     Gi1/0/19    QUERY SET     3   minutes: 0 hour: 8 day: * month: * weekday: *

Switch# show energywise statistics
Children:  48  Errors: 2  Drops: 0  Events:  14

Switch# show energywise usage
Interface   Name                   Usage       Caliber
---------   ----                   -----       -------
            lobby.1                558.0 (W)   max
```

```
Switch# show energywise usage child
Interface    Name                       Usage      Caliber
---------    ----                       _____      _____
             lobby.1                    558.0 (W)  max
Gi1/0/1      Gi1.0.1                    0.0  (W)   presumed
Gi1/0/2      Gi1.0.2                    0.0  (W)   presumed
Gi1/0/3      Gi1.0.3                    0.0  (W)   presumed
Gi1/0/4      Gi1.0.4                    0.0  (W)   presumed
Gi1/0/5      Gi1.0.5                    0.0  (W)   presumed
<output truncated>

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

Related Commands	Command	Description
	energywise (global configuration)	Enables and configures EnergyWise on the entity.
	energywise (interface configuration)	Configures EnergyWise on the PoE port.

show env

Use the **show env** user EXEC command to display fan, temperature, redundant power system (RPS) availability, and power information for the switch being accessed (standalone switch or stack master or stack member). Use with the **stack** keyword to display all information for the stack or for a specified switch in the stack.

> **show env** {**all** | **fan** | **power** | **rps** | **stack** [*switch-number*] | **temperature** [**status**]} [| {**begin** | **exclude** | **include**} *expression*]

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

Command Modes   User EXEC

Command History	Release	Modification
	12.1(11)AX	This command was introduced.
	12.2(20)SE3	The **temperature status** keyword was 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.

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.

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

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

```
Switch> show env all
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is AVAILABLE
```

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 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
SWITCH: 4
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is NOT PRESENT
SWITCH: 5
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is NOT PRESENT
SWITCH: 6
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 2-27 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 2-27   *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** user EXEC command to display error-disabled detection status.

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

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

The error-disable reasons in the command 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** user EXEC command to display conditions that cause an error to be recognized for a cause.

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

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

Command Modes   User EXEC

Command History	Release	Modification
	12.1(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
```

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

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

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

Related Commands

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

show errdisable recovery

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

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

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

Command Modes User EXEC

Command History	Release	Modification
	12.1(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.

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

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

```
Switch> show errdisable recovery
ErrDisable Reason    Timer Status
-----------------    -------------
udld                 Disabled
bpduguard            Disabled
security-violatio    Disabled
channel-misconfig    Disabled
vmps                 Disabled
pagp-flap            Disabled
dtp-flap             Disabled
link-flap            Enabled
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** user EXEC command to display EtherChannel information for a channel.

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

Syntax Description

channel-group-number	(Optional) Number of the channel group. The range is 1 to 48.
detail	Display detailed EtherChannel information.
load-balance	Display the load-balance or frame-distribution scheme among ports in the port channel.
port	Display EtherChannel port information.
port-channel	Display port-channel information.
protocol	Display the protocol that is being used in the EtherChannel.
summary	Display a one-line summary per channel-group.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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).

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

■ show etherchannel

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

Syntax Description

	append	(Optional) Append redirected output to a specified URL
	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*.
	redirect	(Optional) Copy output to a specified URL.
	tee	(Optional) Copy output to a specified URL.
expression	Expression in the output to use as a reference point.
url	Specified URL where output is directed.

Command Modes   Privileged EXEC

Command History

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

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

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

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

```
switch# show 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** user EXEC command to display the flow control status and statistics.

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

Syntax Description

interface *interface-id*	(Optional) Display the flow control status and statistics for a specific interface.
module *number*	(Optional) Display the flow control status and statistics for all interfaces on the specified stack member. The range is 1 to 9. This option is not available if you have entered a specific interface ID.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

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

```
Switch> show flowcontrol
Port      Send FlowControl  Receive FlowControl  RxPause TxPause
          admin    oper     admin    oper
--------- -------- -------- -------- --------     ------- -------
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** user EXEC command to display the IDPROM information for the specified interface.

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

Usage Guidelines   This command applies only to 10-Gigabit Ethernet interfaces.

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

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

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

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

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

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

```
Switch# show idprom interface tengigabitethernet1/0/1
TenGigabitEthernet1/0/1 (gpn:472, port-number:1)
-------------------------------------------------------------
XENPAK Serial EEPROM Contents:
Non-Volatile Register (NVR) Fields
 XENPAK MSA Version supported        :0x15
 NVR Size in bytes                   :0x100
 Number of bytes used                :0xD0
 Basic Field Address                 :0xB
 Customer Field Address              :0x77
 Vendor Field Address                :0xA7
 Extended Vendor Field Address       :0x100
 Reserved                            :0x0
 Transceiver type                    :0x1 =XENPAK
 Optical connector type              :0x1 =SC
 Bit encoding                        :0x1 =NRZ
 Normal BitRate in multiple of 1M b/s :0x2848
 Protocol Type                       :0x1 =10GgE

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

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

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

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

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

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**] [| {**begin** |
> **exclude** | **include**} *expression*]

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.	
	Note The display shows only packets processed in software; hardware-switched packets do not appear.	
capabilities	(Optional) Display the capabilities of all interfaces or the specified interface, including the features and options that you can configure on the interface. Though visible in the command line help, this option is not available for VLAN IDs.	
module *number*	(Optional) Display **capabilities**, **switchport** configuration, or **transceiver** characteristics (depending on preceding keyword) of all interfaces on the 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[1] or DWDM[2] small form-factor (SFP) module interface. The keywords have these meanings: • **detail**—(Optional) Display calibration properties, including high and low numbers and any alarm information. • **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.
| **begin**	(Optional) Display begins with the line that matches the *expression*.
| **exclude**	(Optional) Display excludes lines that match the *expression*.
| **include**	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

1. Coarse wavelength-division multiplexer

2. Dense wavelength-division multiplexer

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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	Added the **backup**, **counters**, **detail**, and **trunk** keywords.
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.

- • 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 output.

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

Examples   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
```

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
Port       Name             Status      Vlan      Duplex  Speed Type
Fa1/0/1                     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 22 is configured as a private-VLAN host port. It is associated with primary VLAN 20 and secondary VLAN 25.

```
Switch# show interfaces fastethernet1/0/22 status
Port       Name             Status      Vlan      Duplex  Speed Type
Fa1/0/22                    connected   20,25     a-full  a-100 10/100BaseTX
```

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

```
Switch# show interfaces fastethernet1/0/20 status
Port       Name             Status      Vlan      Duplex  Speed Type
Fa1/0/20                    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 2-28 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 2-28   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 Operational Mode	Displays the administrative and operational modes.
Administrative Trunking Encapsulation Operational Trunking Encapsulation 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 Trunking VLANs Enabled 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 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.

Table 2-28   show interfaces switchport Field Descriptions (continued)

Field	Description
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: Gi1/0/2
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 gigabitethernet1/0/1 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 gigabitethernet1/0/1 transceiver properties
Name : Gi1/0/1
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.
```

Port	Temperature (Celsius)	High Alarm Threshold (Celsius)	High Warn Threshold (Celsius)	Low Warn Threshold (Celsius)	Low Alarm Threshold (Celsius)
Gi2/0/3	41.5	110.0	103.0	-8.0	-12.0

Port	Voltage (Volts)	High Alarm Threshold (Volts)	High Warn Threshold (Volts)	Low Warn Threshold (Volts)	Low Alarm Threshold (Volts)
Gi2/0/3	3.20	4.00	3.70	3.00	2.95

Port	Current (milliamperes)	High Alarm Threshold (mA)	High Warn Threshold (mA)	Low Warn Threshold (mA)	Low Alarm Threshold (mA)
Gi2/0/3	31.0	84.0	70.0	4.0	2.0

Port	Optical Transmit Power (dBm)	High Alarm Threshold (dBm)	High Warn Threshold (dBm)	Low Warn Threshold (dBm)	Low Alarm Threshold (dBm)
Gi2/0/3	-0.0 (-0.0)	-0.0	-0.0	-0.0	-0.0

Port	Optical Receive Power (dBm)	High Alarm Threshold (dBm)	High Warn Threshold (dBm)	Low Warn Threshold (dBm)	Low Alarm Threshold (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.

Command	Description
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**] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

interface-id	(Optional) ID of the physical interface, including type, stack member, module, and port number.
errors	(Optional) Display error counters.
etherchannel	(Optional) Display EtherChannel counters, including octets, broadcast packets, multicast packets, and unicast packets received and sent.
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.
	Note In this command, the **module** keyword 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.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

Examples

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

```
Switch# show interfaces counters
Port            InOctets    InUcastPkts    InMcastPkts    InBcastPkts
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** user EXEC command to display product identification (PID) information for the hardware.

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

Syntax Description

entity-name	(Optional) Display the specified entity. For example, enter the interface (such as gigabitethernet1/0/1) into which a small form-factor pluggable (SFP) module is installed.
raw	(Optional) Display every entity in the device.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.2(25)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.

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

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

```
Switch> show inventory
NAME: "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*] [| {**begin** | **exclude** | **include**} *expression*]

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).	
	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).	
	You can specify a single VLAN identified by VLAN ID number, a range of VLANs separated by a hyphen, or a series of VLANs separated by a comma. The range is 1 to 4094.	
	begin	(Optional) Display begins with the line that matches the *expression*.
	exclude	(Optional) Display excludes lines that match the *expression*.
	include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.	

Command Modes   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.

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

Examples   This is an example of output from the **show 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
```

	Command	Description
Related Commands	**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** user EXEC command to display the DHCP snooping configuration.

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

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

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

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

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

```
Switch> show ip dhcp snooping binding
MacAddress         IpAddress        Lease(sec)   Type          VLAN  Interface
------------------ ---------------  ----------   ------------  ----  --------------------
01:02:03:04:05:06  10.1.2.150       9837         dhcp-snooping  20   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 2-29 describes the fields in the **show ip dhcp snooping binding** command output:

Table 2-29   *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
	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** user EXEC command to display the status of the DHCP snooping binding database agent.

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

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.2(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** user EXEC command to display DHCP snooping statistics in summary or detail form.

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

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 2-30 shows the DHCP snooping statistics and their descriptions:

Table 2-30   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 2-30   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*] [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes Privileged EXEC

Command History

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

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

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

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

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

Related Commands

Command	Description
ip igmp profile	Configures the specified IGMP profile number.

show ip igmp snooping

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

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

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show ip igmp snooping vlan 1** command. It shows snooping characteristics for a specific VLAN.

```
Switch# show ip igmp snooping vlan 1
Global IGMP Snooping configuration:
-----------------------------------
IGMP snooping              :Enabled
IGMPv3 snooping (minimal) :Enabled
Report suppression         :Enabled
TCN solicit query          :Disabled
```

```
TCN flood query count     :2
Last member query interval : 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.

Command	Description
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.
show ip igmp snooping mrouter	Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN.
show ip igmp snooping querier	Displays the configuration and operation information for the IGMP querier configured on a switch.

show ip igmp snooping groups

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

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

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

Syntax Description

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(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.

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

Examples

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

```
Switch# show ip igmp snooping groups
Vlan     Group          Type       Version     Port List
-----------------------------------------------------------
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, Fa1/0/15
104      224.1.4.3      igmp       v2          Gi2/0/1, Fa1/0/15
```

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, Fa1/0/15
```

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

Syntax Description

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

Command Modes Privileged EXEC

Command History

Release	Modification
12.1(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.

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

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

```
Switch# show ip igmp snooping mrouter
Vlan    ports
----    -----
   1    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** user EXEC command to display the configuration and operation information for the IGMP querier configured on a switch.

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

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.2(25)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** user EXEC command is similar to the **show ip igmp snooping querier** command. However, the **show ip igmp snooping querier** command displays only the device IP address most recently detected by the switch querier.

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

- The elected IGMP querier in the VLAN

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

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

Examples

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

```
Switch> show ip igmp snooping querier
Vlan      IP Address      IGMP Version        Port
-------------------------------------------------------
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** user EXEC command to display the IP source bindings on the switch.

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

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

Command Modes   User EXEC

Command History

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

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

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

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

```
Switch> show ip source binding
MacAddress        IpAddress       Lease(sec)  Type          VLAN  Interface
-------------     --------------  ----------  ------------  ----  --------------------
00:00:00:0A:00:0B 11.0.0.1        infinite    static        10    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** user EXEC command to display the IP source guard configuration on the switch or on a specific interface.

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

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

```
Switch> show ip verify source
Interface  Filter-type  Filter-mode  IP-address       Mac-address     Vlan
---------  -----------  -----------  ---------------  --------------  ---------
gi1/1      ip           active       10.0.0.1                         10
gi1/1      ip           active       deny-all                         11-20
gi1/2      ip           inactive-trust-port
gi1/3      ip           inactive-no-snooping-vlan
gi1/4      ip-mac       active       10.0.0.2         aaaa.bbbb.cccc  10
gi1/4      ip-mac       active       11.0.0.1         aaaa.bbbb.cccd  11
gi1/4      ip-mac       active       deny-all         deny-all        12-20
gi1/5      ip-mac       active       10.0.0.3         permit-all      10
gi1/5      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 gigabitethernet1/6
IP source guard is not configured on the interface gi1/6.
```

Related Commands	Command	Description
	ip verify source	Enables IP source guard on an interface.

show ipc

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

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

Syntax Description

mcast {**appclass** | **groups** | **status**}	Display the IPC multicast routing information. The keywords have these meanings:
	• **appclass**—Display the IPC multicast application classes.
	• **groups**—Display the IPC multicast groups.
	• **status**—Display the IPC multicast routing status.
nodes	Display participating nodes.
ports [**open**]	Display local IPC ports. The keyword has this meaning:
	• **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:
	• **all**—Display all the session statistics.
	• **rx**—Display the sessions statistics for traffic that the switch receives
	• **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:
	• **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.
| **begin**	(Optional) Display begins with the line that matches the *expression*.
| **exclude**	(Optional) Display excludes lines that match the *expression*.
| **include**	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This example shows how to display the IPC routing status:

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

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

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

 Total No Mcast groups                               0           0

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

This example shows how to display the participating nodes:

```
Switch> show ipc nodes
There is 1 node in this IPC realm.
   ID     Type         Name          Last  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** user EXEC command to display the contents of all current IPv6 access lists.

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

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

Syntax Description

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

Command Modes User 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** {**default** | **vlan**) global configuration command and reload the switch.

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

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

Table 2-31 describes the significant fields shown in the display.

Table 2-31   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 2-31   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 commandto 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

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

Syntax Description 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** {**default** | **vlan**) 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.

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** user EXEC command to display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping configuration of the switch or the VLAN.

show ipv6 mld snooping [**vlan** *vlan-id*] [| {**begin** | **exclude** | **include**} *expression*]

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

Syntax Description

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

Command Modes User 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** {**default** | **vlan**} global configuration command and reload the switch.

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

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

```
Switch> show ipv6 mld snooping vlan 100
Global MLD Snooping configuration:
-----------------------------------------
MLD snooping                : Enabled
MLDv2 snooping (minimal)     : Enabled
Listener message suppression : Enabled
TCN solicit query            : Disabled
TCN flood query count        : 2
Robustness variable          : 3
Last listener query count    : 2
Last listener query interval : 1000
```

```
Vlan 100:
--------
MLD snooping                     : Disabled
MLDv1 immediate leave            : Disabled
Explicit host tracking           : Enabled
Multicast router learning mode   : pim-dvmrp
Robustness variable              : 3
Last listener query count        : 2
Last listener query interval     : 1000
```

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

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


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


<output truncated>


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

Related Commands	Command	Description
	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** user EXEC command to display all or specified IP version 6 (IPv6) multicast address information maintained by Multicast Listener Discovery (MLD) snooping.

show ipv6 mld snooping address [[**vlan** *vlan-id*] [*ipv6 address*]] [**vlan** *vlan-id*] [**count** | **dynamic** | **user**] [| {**begin** | **exclude** | **include**} *expression*]

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

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

Command Modes   User EXEC

Command History

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

Usage Guidelines   Use this command to display IPv6 multicast address information.

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

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

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

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

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

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

```
Switch> show ipv6 mld snooping address

Vlan Group    Type Version Port List
-----------------------------------------------------------
2    FF12::3 user        Fa1/0/2, Gi2/0/2, Gi3/0/1,Gi3/0/3
EX
```

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

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

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

```
Switch> show ipv6 mld snooping address user
Vlan Group   Type Version Port List
-----------------------------------------------------------
2    FF12::3 user  v2    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** user EXEC command to display dynamically learned and manually configured IP version 6 (IPv6) Multicast Listener Discovery (MLD) router ports for the switch or a VLAN.

> **show ipv6 mld snooping mrouter** [**vlan** *vlan-id*] [**|** {**begin** | **exclude** | **include**} *expression*]

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

Syntax Description

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

Command Modes   User 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** {**default** | **vlan**} global configuration command and reload the switch.

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

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

```
Switch> show ipv6 mld snooping mrouter
Vlan    ports
----    -----
   2    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)
```

	Command	Description
Related Commands	**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** user EXEC command to display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping querier-related information most recently received by the switch or the VLAN.

show ipv6 mld snooping querier [**vlan** *vlan-id*] [**detail**] [| {**begin** | **exclude** | **include**} *expression*]

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

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

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

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

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

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

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

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

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

```
Switch> show ipv6 mld snooping querier detail
Vlan      IP Address               MLD Version Port
-------------------------------------------------------------
2         FE80::201:C9FF:FE40:6000 v1          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 user EXEC command 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*]}] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description		
protocol	(Optional) Displays routes for the specified routing protocol using any of these keywords:	
	• **bgp**	
	• **isis**	
	• **ospf**	
	• **rip**	
	or displays routes for the specified type of route using any of these keywords:	
	• **connected**	
	• **local**	
	• **static**	
	• **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**.	
| begin	(Optional) Display begins with the line that matches the *expression*.	
| exclude	(Optional) Display excludes lines that match the *expression*.	
| include	(Optional) Display includes lines that match the specified *expression*.	
expression	Expression in the output to use as a reference point.	

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(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.

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

Examples   This is an example of output from the **show ipv6 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. For syntax information, select **Cisco IOS Software > Command References for the Cisco IOS Software Releases 12.3 Mainline > Cisco IOS IPv6 Command Reference > IPv6 Commands: show ipv6 nat translations through show ipv6 protocols**

show l2protocol-tunnel

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

> **show l2protocol-tunnel** [**interface** *interface-id*] [**summary**] [**|** {**begin** | **exclude** | **include**}
> *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.2(25)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.

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

Examples

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

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

Port       Protocol Shutdown  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** user EXEC command to display Link Aggregation Control Protocol (LACP) channel-group information.

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

Syntax Description

channel-group-number	(Optional) Number of the channel group. The range is 1 to 48.
counters	Display traffic information.
internal	Display internal information.
neighbor	Display neighbor information.
sys-id	Display the system identifier that is being used by LACP. The system identifier is made up of the LACP system priority and the switch MAC address.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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**.

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

Examples   This is an example of output from the **show lacp counters** user EXEC command. Table 2-32 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 2-32   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 2-33 describes the fields in the display:

Table 2-33   show lacp internal Field Descriptions

Field	Description
State	State of the specific port. These are the allowed values: • – —Port is in an unknown state. • **bndl**—Port is attached to an aggregator and bundled with other ports. • **susp**—Port is in a suspended state; it is not attached to any aggregator. • **hot-sby**—Port is in a hot-standby state. • **indiv**—Port is incapable of bundling with any other port. • **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). • **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 2-33   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: • bit0: LACP_Activity • bit1: LACP_Timeout • bit2: Aggregation • bit3: Synchronization • bit4: Collecting • bit5: Distributing • bit6: Defaulted • bit7: Expired **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 location

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

show location admin-tag | [| {**begin** | **exclude** | **include**} *expression*]

show location civic-location {**identifier** *id number* | **interface** *interface-id* | **static** } | {**begin** | **exclude** | **include**} *expression*]

show location elin-location {**identifier** *id number* | **interface** *interface-id* | **static** } | {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

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

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

```
Switch> show location civic interface 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 link state group

Use the **show link state group** privileged EXEC command to display the link-state group information.

show link state group [*number*] [**detail**] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

number	(Optional) Number of the link-state group.
detail	(Optional) Specify that detailed information appears.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

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.

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

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

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

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

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

Link State Group: 1 Status: Enabled, Down
Upstream Interfaces : 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. For syntax information, select **Cisco IOS Configuration Fundamentals Command Reference for Release 12.2 > Cisco IOS File Management Commands > Configuration File Commands**.

show mac access-group

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

> **show mac access-group** [**interface** *interface-id*] [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

interface *interface-id*	(Optional) Display the MAC ACLs configured on a specific interface. Valid interfaces are physical ports and port channels; the port-channel range is 1 to 48 (available only in privileged EXEC mode).
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show mac-access group** user EXEC 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** user EXEC command to display a specific MAC address table static and dynamic entry or the MAC address table static and dynamic entries on a specific interface or VLAN.

show mac address-table [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.1(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).

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

Examples   This is an example of output from the **show mac address-table** command:

```
Switch> show mac address-table
          Mac Address Table
-------------------------------------------
Vlan    Mac Address       Type        Ports
----    -----------       ----        -----
 All    0000.0000.0001    STATIC      CPU
 All    0000.0000.0002    STATIC      CPU
 All    0000.0000.0003    STATIC      CPU
 All    0000.0000.0009    STATIC      CPU
 All    0000.0000.0012    STATIC      CPU
 All    0180.c200.000b    STATIC      CPU
 All    0180.c200.000c    STATIC      CPU
 All    0180.c200.000d    STATIC      CPU
 All    0180.c200.000e    STATIC      CPU
 All    0180.c200.000f    STATIC      CPU
 All    0180.c200.0010    STATIC      CPU
   1    0030.9441.6327    DYNAMIC     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.
	show mac address-table interface	Displays the MAC address table information for the specified interface.
	show mac address-table notification	Displays the MAC address notification settings for all interfaces or the specified interface.
	show mac address-table static	Displays static MAC address table entries only.
	show mac address-table vlan	Displays the MAC address table information for the specified VLAN.

show mac address-table address

Use the **show mac address-table address** user EXEC command to display MAC address table information for the specified MAC address.

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

Syntax Description

mac-address	Specify the 48-bit MAC address; the valid format is H.H.H.
interface *interface-id*	(Optional) Display information for a specific interface. Valid interfaces include physical ports and port channels.
vlan *vlan-id*	(Optional) Display entries for the specific VLAN only. The range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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).

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

Examples   This is an example of output from the **show mac address-table address** command:

```
Switch# show mac address-table address 0002.4b28.c482
          Mac Address Table
-----------------------------------------

Vlan    Mac Address      Type    Ports
----    -----------      ----    -----
 All    0002.4b28.c482  STATIC  CPU
Total Mac Addresses for this criterion: 1
```

Related Commands	Command	Description
	show mac address-table aging-time	Displays the aging time in all VLANs or the specified VLAN.
	show mac address-table count	Displays the number of addresses present in all VLANs or the specified VLAN.
	show mac address-table dynamic	Displays dynamic MAC address table entries only.
	show mac address-table interface	Displays the MAC address table information for the specified interface.
	show mac address-table notification	Displays the MAC address notification settings for all interfaces or the specified interface.
	show mac address-table static	Displays static MAC address table entries only.
	show mac address-table vlan	Displays the MAC address table information for the specified VLAN.

show mac address-table aging-time

Use the **show mac address-table aging-time** user EXEC command to display the aging time of a specific address table instance, all address table instances on a specified VLAN or, if a specific VLAN is not specified, on all VLANs.

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

Syntax Description

vlan *vlan-id*	(Optional) Display aging time information for a specific VLAN. The range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show mac address-table aging-time** command:

```
Switch> show mac address-table aging-time
Vlan    Aging Time
----    ----------
   1    300
```

This is an example of output from the **show mac address-table aging-time vlan 10** command:

```
Switch> show mac address-table aging-time vlan 10
Vlan    Aging Time
----    ----------
  10    300
```

Related Commands	Command	Description
	mac address-table aging-time	Sets the length of time that a dynamic entry remains in the MAC address table after the entry is used or updated.
	show mac address-table address	Displays MAC address table information for the specified MAC address.
	show mac address-table count	Displays the number of addresses present in all VLANs or the specified VLAN.
	show mac address-table dynamic	Displays dynamic MAC address table entries only.
	show mac address-table interface	Displays the MAC address table information for the specified interface.
	show mac address-table notification	Displays the MAC address notification settings for all interfaces or the specified interface.
	show mac address-table static	Displays static MAC address table entries only.
	show mac address-table vlan	Displays the MAC address table information for the specified VLAN.

show mac address-table count

Use the **show mac address-table count** user EXEC command to display the number of addresses present in all VLANs or the specified VLAN.

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

Syntax Description

vlan *vlan-id*	(Optional) Display the number of addresses for a specific VLAN. The range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show mac address-table count** command:

```
Switch# show mac address-table count
Mac Entries for Vlan   : 1
--------------------------
Dynamic Address Count  : 2
Static  Address Count  : 0
Total Mac Addresses    : 2
```

	Command	Description
Related Commands	**show mac address-table address**	Displays MAC address table information for the specified MAC address.
	show mac address-table aging-time	Displays the aging time in all VLANs or the specified VLAN.
	show mac address-table dynamic	Displays dynamic MAC address table entries only.
	show mac address-table interface	Displays the MAC address table information for the specified interface.
	show mac address-table notification	Displays the MAC address notification settings for all interfaces or the specified interface.
	show mac address-table static	Displays static MAC address table entries only.
	show mac address-table vlan	Displays the MAC address table information for the specified VLAN.

show mac address-table dynamic

Use the **show mac address-table dynamic** user EXEC command to display only dynamic MAC address table entries.

> **show mac address-table dynamic** [**address** *mac-address*] [**interface** *interface-id*] [**vlan** *vlan-id*]
> [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

address *mac-address*	(Optional) Specify a 48-bit MAC address; the valid format is H.H.H (available in privileged EXEC mode only).
interface *interface-id*	(Optional) Specify an interface to match; valid *interfaces* include physical ports and port channels.
vlan *vlan-id*	(Optional) Display entries for a specific VLAN; the range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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).

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

Examples   This is an example of output from the **show mac address-table dynamic** command:

```
Switch> show mac address-table dynamic
          Mac Address Table
-------------------------------------------

Vlan    Mac Address      Type    Ports
----    -----------      ----    -----
   1    0030.b635.7862   DYNAMIC 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.
	show mac address-table interface	Displays the MAC address table information for the specified interface.
	show mac address-table static	Displays static MAC address table entries only.
	show mac address-table vlan	Displays the MAC address table information for the specified VLAN.

show mac address-table interface

Use the **show mac address-table interface** user command to display the MAC address table information for the specified interface in the specified VLAN.

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

Syntax Description

interface-id	Specify an interface type; valid interfaces include physical ports and port channels.
vlan *vlan-id*	(Optional) Display entries for a specific VLAN; the range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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).

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

Examples   This is an example of output from the **show mac address-table interface** command:

```
Switch> show mac address-table interface 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
```

	Command	Description
Related Commands	**show mac address-table address**	Displays MAC address table information for the specified MAC address.
	show mac address-table aging-time	Displays the aging time in all VLANs or the specified VLAN.
	show mac address-table count	Displays the number of addresses present in all VLANs or the specified VLAN.
	show mac address-table dynamic	Displays dynamic MAC address table entries only.
	show mac address-table notification	Displays the MAC address notification settings for all interfaces or the specified interface.
	show mac address-table static	Displays static MAC address table entries only.
	show mac address-table vlan	Displays the MAC address table information for the specified VLAN.

show mac address-table learning

Use the **show mac address-table learning** user EXEC command to display the status of MAC address learning for all VLANs or the specified VLAN.

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

Syntax Description		
vlan *vlan-id*	(Optional) Display information for a specific VLAN. The range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History	Release	Modification
	12.2(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.

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

Examples   This is an example of output from the **show mac address-table learning** user EXEC command showing that MAC address learning is disabled on VLAN 200:

```
Switch> show mac address-table learning
VLAN    Learning Status
----    ---------------
1           yes
100         yes
200         no
```

Related Commands	Command	Description
	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** user EXEC command to display the MAC address-table move update information on the switch.

show mac address-table move update [| {**begin** | **exclude** | **include**} **expression**]

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show mac address-table move update** command:

```
Switch> show mac address-table move update
Switch-ID : 010b.4630.1780
Dst mac-address : 0180.c200.0010
Vlans/Macs supported : 1023/8320
Default/Current settings: Rcv Off/On, Xmt Off/On
Max packets per min : Rcv 40, Xmt 60
Rcv packet count : 10
Rcv conforming packet count : 5
Rcv invalid packet count : 0
Rcv packet count this min : 0
Rcv threshold exceed count : 0
Rcv last sequence# this min : 0
Rcv last interface : Po2
Rcv last src-mac-address : 0003.fd6a.8701
Rcv last switch-ID : 0303.fd63.7600
Xmt packet count : 0
Xmt packet count this min : 0
Xmt threshold exceed count : 0
Xmt pak buf unavail cnt : 0
Xmt last interface : None
switch#
```

Related Commands

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

show mac address-table notification

Use the **show mac address-table notification** user EXEC command to display the MAC address notification settings for all interfaces or the specified interface.

> **show mac address-table notification** [**interface** [*interface-id*]] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

interface	(Optional) Display information for all interfaces. Valid interfaces include physical ports and port channels.
interface-id	(Optional) Display information for the specified interface. Valid interfaces include physical ports and port channels.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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).

Usage Guidelines   Use the **show mac address-table notification** command without any keywords to display whether the feature is enabled or disabled, the MAC notification interval, the maximum number of entries allowed in the history table, and the history table contents.

Use the **interface** keyword to display the flags for all interfaces. If the *interface-id* is included, only the flags for that interface appear.

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

Examples   This is an example of output from the **show mac address-table notification** command:

```
Switch> show mac address-table notification
MAC Notification Feature is Enabled on the switch
Interval between Notification Traps : 60 secs
Number of MAC Addresses Added : 4
Number of MAC Addresses Removed : 4
Number of Notifications sent to NMS : 3
Maximum Number of entries configured in History Table : 100
Current History Table Length : 3
MAC Notification Traps are Enabled
History Table contents
----------------------
History Index 0, Entry Timestamp 1032254, Despatch Timestamp 1032254
MAC Changed Message :
Operation: Added   Vlan: 2    MAC Addr: 0000.0000.0001 Module: 0   Port: 1

History Index 1, Entry Timestamp 1038254, Despatch Timestamp 1038254
MAC Changed Message :
Operation: Added   Vlan: 2    MAC Addr: 0000.0000.0000 Module: 0   Port: 1
Operation: Added   Vlan: 2    MAC Addr: 0000.0000.0002 Module: 0   Port: 1
Operation: Added   Vlan: 2    MAC Addr: 0000.0000.0003 Module: 0   Port: 1

History Index 2, Entry Timestamp 1074254, Despatch Timestamp 1074254
MAC Changed Message :
Operation: Deleted Vlan: 2    MAC Addr: 0000.0000.0000 Module: 0   Port: 1
Operation: Deleted Vlan: 2    MAC Addr: 0000.0000.0001 Module: 0   Port: 1
Operation: Deleted Vlan: 2    MAC Addr: 0000.0000.0002 Module: 0   Port: 1
Operation: Deleted Vlan: 2    MAC Addr: 0000.0000.0003 Module: 0   Port: 1
```

Related Commands

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

show mac address-table static

Use the **show mac address-table static** user EXEC command to display only static MAC address table entries.

> **show mac address-table static** [**address** *mac-address*] [**interface** *interface-id*] [**vlan** *vlan-id*]
> [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

address *mac-address*	(Optional) Specify a 48-bit MAC address; the valid format is H.H.H (available in privileged EXEC mode only).
interface *interface-id*	(Optional) Specify an interface to match; valid *interfaces* include physical ports and port channels.
vlan *vlan-id*	(Optional) Display addresses for a specific VLAN. The range is 1 to 4094.
| **begin**	(Optional) Display begins with the line that matches the *expression*.
| **exclude**	(Optional) Display excludes lines that match the *expression*.
| **include**	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes

User EXEC

Command History

Release	**Modification**
12.1(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).

Usage Guidelines

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

Examples   This is an example of output from the **show mac address-table static** command:

```
Switch> show mac address-table static
          Mac Address Table
-----------------------------------------

Vlan    Mac Address      Type    Ports
----    -----------      ----    -----
 All    0100.0ccc.cccc   STATIC  CPU
 All    0180.c200.0000   STATIC  CPU
 All    0100.0ccc.cccd   STATIC  CPU
 All    0180.c200.0001   STATIC  CPU
 All    0180.c200.0004   STATIC  CPU
 All    0180.c200.0005   STATIC  CPU
   4    0001.0002.0004   STATIC  Drop
   6    0001.0002.0007   STATIC  Drop
Total Mac Addresses for this criterion: 8
```

Related Commands

Command	Description
mac address-table static	Adds static addresses to the MAC address table.
mac address-table static drop	Enables unicast MAC address filtering and configures the switch to drop traffic with a specific source or destination MAC address.
show mac address-table address	Displays MAC address table information for the specified MAC address.
show mac address-table aging-time	Displays the aging time in all VLANs or the specified VLAN.
show mac address-table count	Displays the number of addresses present in all VLANs or the specified VLAN.
show mac address-table dynamic	Displays dynamic MAC address table entries only.
show mac address-table interface	Displays the MAC address table information for the specified interface.
show mac address-table notification	Displays the MAC address notification settings for all interfaces or the specified interface.
show mac address-table vlan	Displays the MAC address table information for the specified VLAN.

show mac address-table vlan

Use the **show mac address-table vlan** user EXEC command to display the MAC address table information for the specified VLAN.

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

Syntax Description

vlan-id	(Optional) Display addresses for a specific VLAN. The range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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).

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

Examples   This is an example of output from the **show mac address-table vlan 1** command:

```
Switch> show mac address-table vlan 1
          Mac Address Table
-------------------------------------------

Vlan    Mac Address      Type      Ports
----    -----------      ----      -----
   1    0100.0ccc.cccc   STATIC    CPU
   1    0180.c200.0000   STATIC    CPU
   1    0100.0ccc.cccd   STATIC    CPU
   1    0180.c200.0001   STATIC    CPU
   1    0180.c200.0002   STATIC    CPU
   1    0180.c200.0003   STATIC    CPU
   1    0180.c200.0005   STATIC    CPU
   1    0180.c200.0006   STATIC    CPU
   1    0180.c200.0007   STATIC    CPU
Total Mac Addresses for this criterion: 9
```

Related Commands

Command	Description
show mac address-table address	Displays MAC address table information for the specified MAC address.
show mac address-table aging-time	Displays the aging time in all VLANs or the specified VLAN.
show mac address-table count	Displays the number of addresses present in all VLANs or the specified VLAN.
show mac address-table dynamic	Displays dynamic MAC address table entries only.
show mac address-table interface	Displays the MAC address table information for the specified interface.
show mac address-table notification	Displays the MAC address notification settings for all interfaces or the specified interface.
show mac address-table static	Displays static MAC address table entries only.

show mls qos

Use the **show mls qos** user EXEC command to display global quality of service (QoS) configuration information.

show mls qos [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes User EXEC

Command History

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

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

Examples This is an example of output from the **show mls qos** command 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** user EXEC command to display the quality of service (QoS) aggregate policer configuration. A policer defines a maximum permissible rate of transmission, a maximum burst size for transmissions, and an action to take if either maximum is exceeded.

> **show mls qos aggregate-policer** [*aggregate-policer-name*] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show mls qos aggregate-policer** command:

```
Switch> show mls qos aggregate-policer policer1
aggregate-policer policer1 1000000 2000000 exceed-action drop
Not used by any policy map
```

Related Commands

Command	Description
mls qos aggregate-policer	Defines policer parameters that can be shared by multiple classes within a policy map.

show mls qos input-queue

Use the **show mls qos input-queue** user EXEC command to display quality of service (QoS) settings for the ingress queues.

show mls qos input-queue [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show mls qos input-queue** command:

```
Switch> show mls qos input-queue
Queue      :    1      2
--------------------------------------------
buffers    :    90     10
bandwidth :    4      4
priority   :    0      10
threshold1:    100    100
threshold2:    100    100
```

Related Commands

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

show mls qos interface

Use the **show mls qos interface** user EXEC command to display quality of service (QoS) information at the port level.

> **show mls qos interface** [*interface-id*] [**buffers** | **queueing** | **statistics**]
> [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

interface-id	(Optional) Display QoS information for the specified port. Valid interfaces include physical ports.
buffers	(Optional) Display the buffer allocation among the queues.
queueing	(Optional) Display the queueing strategy (shared or shaped) and the weights corresponding to the queues.
statistics	(Optional) Display statistics for sent and received Differentiated Services Code Points (DSCPs) and class of service (CoS) values, the number of packets enqueued or dropped per egress queue, and the number of in-profile and out-of-profile packets for each policer.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

> ✎
> **Note**   Though visible in the command-line help string, the **policer** keyword is not supported.

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show mls qos interface** *interface-id* command when VLAN-based QoS is enabled:

```
Switch> show mls qos interface 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 2-34 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 2-34   ***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.

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

show mls qos maps

Use the **show mls qos maps** user EXEC command to display quality of service (QoS) mapping information. During classification, QoS uses the mapping tables to represent the priority of the traffic and to derive a corresponding class of service (CoS) or Differentiated Services Code Point (DSCP) value from the received CoS, DSCP, or IP precedence value.

show mls qos maps [**cos-dscp** | **cos-input-q** | **cos-output-q** | **dscp-cos** | **dscp-input-q** | **dscp-mutation** *dscp-mutation-name* | **dscp-output-q** | **ip-prec-dscp** | **policed-dscp**] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

The policed-DSCP, DSCP-to-CoS, and the DSCP-to-DSCP-mutation maps appear as a matrix. The d1 column specifies the most-significant digit in the DSCP. The d2 row specifies the least-significant digit in the DSCP. The intersection of the d1 and d2 values provides the policed-DSCP, the CoS, or the mutated-DSCP value. For example, in the DSCP-to-CoS map, a DSCP value of 43 corresponds to a CoS value of 5.

The DSCP input queue threshold and the DSCP output queue threshold maps appear as a matrix. The d1 column specifies the most-significant digit of the DSCP number. The d2 row specifies the least-significant digit in the DSCP number. The intersection of the d1 and the d2 values provides the queue ID and threshold ID. For example, in the DSCP input queue threshold map, a DSCP value of 43 corresponds to queue 2 and threshold 1 (02-01).

The CoS input queue threshold and the CoS output queue threshold maps show the CoS value in the top row and the corresponding queue ID and threshold ID in the second row. For example, in the CoS input queue threshold map, a CoS value of 5 corresponds to queue 2 and threshold 1 (2-1).

Examples   This is an example of output from the **show mls qos maps** command:

```
Switch> show mls qos maps
Policed-dscp map:
     d1 :  d2 0   1   2   3   4   5   6   7   8   9
     ---------------------------------------
     0 :     00 01 02 03 04 05 06 07 08 09
     1 :     10 11 12 13 14 15 16 17 18 19
     2 :     20 21 22 23 24 25 26 27 28 29
     3 :     30 31 32 33 34 35 36 37 38 39
     4 :     40 41 42 43 44 45 46 47 48 49
     5 :     50 51 52 53 54 55 56 57 58 59
     6 :     60 61 62 63

Dscp-cos map:
     d1 :  d2 0   1   2   3   4   5   6   7   8   9
     ---------------------------------------
     0 :     00 00 00 00 00 00 00 00 01 01
     1 :     01 01 01 01 01 01 02 02 02 02
     2 :     02 02 02 02 03 03 03 03 03 03
     3 :     03 03 04 04 04 04 04 04 04 04
     4 :     05 05 05 05 05 05 05 05 06 06
     5 :     06 06 06 06 06 06 07 07 07 07
     6 :     07 07 07 07

Cos-dscp map:
     cos:   0   1   2   3   4   5   6   7
   -------------------------------
     dscp:  0   8  16  24  32  40  48  56

IpPrecedence-dscp map:
     ipprec:  0   1   2   3   4   5   6   7
     -------------------------------
       dscp:  0   8  16  24  32  40  48  56

Dscp-outputq-threshold map:
   d1 :d2    0     1     2     3     4     5     6     7     8     9
   ------------------------------------------------------------------
   0 :     02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01
   1 :     02-01 02-01 02-01 02-01 02-01 02-01 03-01 03-01 03-01 03-01
   2 :     03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01
   3 :     03-01 03-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01
   4 :     01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 04-01 04-01
   5 :     04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01
   6 :     04-01 04-01 04-01 04-01
```

```
Dscp-inputq-threshold map:
    d1 :d2   0     1     2     3     4     5     6     7     8     9
    ------------------------------------------------------------------
    0 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
    1 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
    2 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
    3 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
    4 :    02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 01-01 01-01
    5 :    01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01
    6 :    01-01 01-01 01-01 01-01

Cos-outputq-threshold map:
            cos:  0   1   2   3   4   5   6   7
            ------------------------------------
  queue-threshold: 2-1 2-1 3-1 3-1 4-1 1-1 4-1 4-1

  Cos-inputq-threshold map:
            cos:  0   1   2   3   4   5   6   7
            ------------------------------------
  queue-threshold: 1-1 1-1 1-1 1-1 1-1 2-1 1-1 1-1

Dscp-dscp mutation map:
  Default DSCP Mutation Map:
    d1 :  d2 0  1  2  3  4  5  6  7  8  9
    ---------------------------------------
    0 :    00 01 02 03 04 05 06 07 08 09
    1 :    10 11 12 13 14 15 16 17 18 19
    2 :    20 21 22 23 24 25 26 27 28 29
    3 :    30 31 32 33 34 35 36 37 38 39
    4 :    40 41 42 43 44 45 46 47 48 49
    5 :    50 51 52 53 54 55 56 57 58 59
    6 :    60 61 62 63
```

Related Commands	Command	Description
	mls qos map	Defines the CoS-to-DSCP map, DSCP-to-CoS map, DSCP-to-DSCP-mutation map, IP-precedence-to-DSCP map, and the policed-DSCP map.
	mls qos srr-queue input cos-map	Maps CoS values to an ingress queue or maps CoS values to a queue and to a threshold ID.
	mls qos srr-queue input dscp-map	Maps DSCP values to an ingress queue or maps DSCP values to a queue and to a threshold ID.
	mls qos srr-queue output cos-map	Maps CoS values to an egress queue or maps CoS values to a queue and to a threshold ID.
	mls qos srr-queue output dscp-map	Maps DSCP values to an egress queue or maps DSCP values to a queue and to a threshold ID.

show mls qos queue-set

Use the **show mls qos queue-set** user EXEC command to display quality of service (QoS) settings for the egress queues.

show mls qos queue-set [*qset-id*] [| {**begin** | **exclude** | **include**} *expression*]

<table>
<tr><td>**Syntax Description**</td><td>*qset-id*</td><td>(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.</td></tr>
<tr><td></td><td>| **begin**</td><td>(Optional) Display begins with the line that matches the *expression*.</td></tr>
<tr><td></td><td>| **exclude**</td><td>(Optional) Display excludes lines that match the *expression*.</td></tr>
<tr><td></td><td>| **include**</td><td>(Optional) Display includes lines that match the specified *expression*.</td></tr>
<tr><td></td><td>*expression*</td><td>Expression in the output to use as a reference point.</td></tr>
</table>

Command Modes   User EXEC

Command History

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

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

Examples   This is an example of output from the **show mls qos queue-set** command:

```
Switch> show mls qos queue-set
Queueset: 1
Queue    :       1       2       3       4
----------------------------------------------
buffers   :      25      25      25      25
threshold1:      100     200     100     100
threshold2:      100     200     100     100
reserved  :      50      50      50      50
maximum   :      400     400     400     400
Queueset: 2
Queue    :       1       2       3       4
----------------------------------------------
buffers   :      25      25      25      25
threshold1:      100     200     100     100
threshold2:      100     200     100     100
reserved  :      50      50      50      50
maximum   :      400     400     400     400
```

	Command	Description
Related Commands	**mls qos queue-set output buffers**	Allocates buffers to the queue-set.
	mls qos queue-set output threshold	Configures the weighted tail-drop (WTD) thresholds, guarantees the availability of buffers, and configures the maximum memory allocation of the queue-set.

show mls qos vlan

Use the **show mls qos vlan** user EXEC command to display the policy maps attached to a switch virtual interface (SVI).

show mls qos vlan *vlan-id* [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.2(25)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.

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

Examples   This is an example of output from the **show mls qos vlan** command:

```
Switch> show mls qos vlan 10
Vlan10
Attached policy-map for Ingress:pm-test-pm-2
```

Related Commands

Command	Description
policy-map	Creates or modifies a policy map that can be attached to multiple ports and enters policy-map configuration mode.

show monitor

Use the **show monitor** user EXEC command to display information about all Switched Port Analyzer (SPAN) and Remote SPAN (RSPAN) sessions on the switch. Use the command with keywords to show a specific session, all sessions, all local sessions, or all remote sessions.

> **show monitor** [**session** {*session_number* | **all** | **local** | **range** *list* | **remote**} [**detail**]] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

session	(Optional) Display information about specified SPAN sessions.
session_number	Specify the number of the SPAN or RSPAN session. The range is 1 to 66.
all	Display all SPAN sessions.
local	Display only local SPAN sessions.
range *list*	Display a range of SPAN sessions, where *list* is the range of valid sessions, either a single session or a range of sessions described by two numbers, the lower one first, separated by a hyphen. Do not enter any spaces between comma-separated parameters or in hyphen-specified ranges. **Note** This keyword is available only in privileged EXEC mode.
remote	Display only remote SPAN sessions.
detail	(Optional) Display detailed information about the specified sessions.
| begin	Display begins with the line that matches the *expression*.
| exclude	Display excludes lines that match the *expression*.
| include	Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes User EXEC

Command History

Release	Modification
12.1(11)AX	This command was introduced.
12.1(14)EA1	The **range** *list* and **detail** keywords were added.

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

The output is the same for the **show monitor** command and the **show monitor session all** command.

Examples   This is an example of output for the **show monitor** user EXEC command:

```
Switch# show monitor
Session 1
---------
Type : Local Session
Source Ports :
RX Only : 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** user EXEC 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** user EXEC 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 : Fa4/012
Encapsulation : Replicate
Ingress : Enabled, default VLAN = 4
Ingress encap : Untagged
```

Related Commands	Command	Description
	monitor session	Starts or modifies a SPAN or RSPAN session.

show mvr

Use the **show mvr** privileged EXEC command without keywords to display the current Multicast VLAN Registration (MVR) global parameter values, including whether or not MVR is enabled, the MVR multicast VLAN, the maximum query response time, the number of multicast groups, and the MVR mode (dynamic or compatible).

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

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

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.1(11)AX	This command was introduced.

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

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

```
Switch# show mvr
MVR Running: TRUE
MVR multicast VLAN: 1
MVR Max Multicast Groups: 256
MVR Current multicast groups: 0
MVR Global query response time: 5 (tenths of sec)
MVR Mode: compatible
```

In the preceding display, the maximum number of multicast groups is fixed at 256. The MVR mode is either compatible (for interoperability with Catalyst 2900 XL and Catalyst 3500 XL switches) or dynamic (where operation is consistent with IGMP snooping operation and dynamic MVR membership on source ports is supported).

Related Commands	Command	Description
	mvr (global configuration)	Enables and configures multicast VLAN registration on the switch.
	mvr (interface configuration)	Configures MVR ports.
	show mvr interface	Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the **interface** and **members** keywords are appended to the command.
	show mvr members	Displays all ports that are members of an MVR multicast group or, if there are no members, means the group is inactive.

show mvr interface

Use the **show mvr interface** privileged EXEC command without keywords to display the Multicast VLAN Registration (MVR) receiver and source ports. Use the command with keywords to display MVR parameters for a specific receiver port.

show mvr interface [*interface-id* [**members** [**vlan** *vlan-id*]]] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

interface-id	(Optional) Display MVR type, status, and Immediate Leave setting for the interface.
	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.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

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

```
Switch# show mvr interface
Port        Type            Status          Immediate Leave
----        ----            -------         --------------
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*] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

ip-address	(Optional) The IP multicast address. If the address is entered, all receiver and source ports that are members of the multicast group appear. If no address is entered, all members of all Multicast VLAN Registration (MVR) groups are listed. If a group has no members, the group is listed as Inactive.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show mvr members** command:

```
Switch# show mvr members
MVR Group IP    Status        Members
------------    ------        -------
239.255.0.1     ACTIVE        Gi1/0/1(d), Gi1/0/5(s)
239.255.0.2     INACTIVE      None
239.255.0.3     INACTIVE      None
239.255.0.4     INACTIVE      None
239.255.0.5     INACTIVE      None
239.255.0.6     INACTIVE      None
239.255.0.7     INACTIVE      None
239.255.0.8     INACTIVE      None
239.255.0.9     INACTIVE      None
239.255.0.10    INACTIVE      None

<output truncated>
```

This is an example of output from the **show mvr members** *ip-address* command. It displays the members of the IP multicast group with that address:

```
Switch# show mvr members 239.255.0.2
239.255.003.--22    ACTIVE          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**] [| {**begin** | **exclude** | **include**} *expression*]

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(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**}} [| {**begin** | **exclude** | **include**} *expression*]

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. • **connection**—display the message counters on each connection. • **summary**—display the global counters.
status	Display information about the NMSP connections.
subscription {**detail**	**summary**}	Display the subscription information on each NMSP connection. • **detail**—display all services and subservices subscribed on each connection. • **summary**—display all services subscribed on each connection.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(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** user EXEC command to display Port Aggregation Protocol (PAgP) channel-group information.

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

Syntax Description

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

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show pagp 1 counters** command:

```
Switch> show pagp 1 counters
            Information      Flush
Port        Sent  Recv    Sent  Recv
-------------------------------------
Channel group: 1
  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 parser macro

Use the **show parser macro** user EXEC command to display the parameters for all configured macros or for one macro on the switch.

> **show parser macro** [{**brief** | **description** [**interface** *interface-id*] | **name** *macro-name*}] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

brief	(Optional) Display the name of each macro.
description [**interface** *interface-id*]	(Optional) Display all macro descriptions or the description of a specific interface.
name *macro-name*	(Optional) Display information about a single macro identified by the macro name.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(19)EA1	The command was introduced.

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

Examples   This is a partial output example from the **show parser macro** command. The output for the Cisco-default macros varies depending on the switch platform and the software image running on the switch:

```
Switch# show parser macro
Total number of macros = 6
--------------------------------------------------------------
Macro name : cisco-global
Macro type : default global
# Enable dynamic port error recovery for link state
# failures
errdisable recovery cause link-flap
errdisable recovery interval 60

<output truncated>


--------------------------------------------------------------
Macro name : cisco-desktop
Macro type : default interface
# macro keywords $AVID
# Basic interface - Enable data VLAN only
```

```
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access

<output truncated>


--------------------------------------------------------------
Macro name : cisco-phone
Macro type : default interface
# Cisco IP phone + desktop template
# macro keywords $AVID $VVID
# VoIP enabled interface - Enable data VLAN
# and voice VLAN (VVID)
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access

<output truncated>


--------------------------------------------------------------
Macro name : cisco-switch
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Do not apply to EtherChannel/Port Group
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID

<output truncated>


--------------------------------------------------------------
Macro name : cisco-router
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID

<output truncated>


--------------------------------------------------------------
Macro name : snmp
Macro type : customizable

#enable port security, linkup, and linkdown traps
snmp-server enable traps port-security
snmp-server enable traps linkup
snmp-server enable traps linkdown
#set snmp-server host
snmp-server host ADDRESS
#set SNMP trap notifications precedence
snmp-server ip precedence VALUE
```

This is an example of output from the **show parser macro name** command:

```
Switch# show parser macro name standard-switch10
Macro name : standard-switch10
Macro type : customizable
macro description standard-switch10
# Trust QoS settings on VOIP packets
auto qos voip trust
```

```
# Allow port channels to be automatically formed
channel-protocol pagp
```

This is an example of output from the **show parser macro brief** command:

```
Switch# show parser macro brief
    default global   : cisco-global
    default interface: cisco-desktop
    default interface: cisco-phone
    default interface: cisco-switch
    default interface: cisco-router
    customizable     : snmp
```

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

```
Switch# show parser macro description
Global Macro(s): cisco-global
Interface    Macro Description(s)
--------------------------------------------------------------
Gi1/0/1        standard-switch10
Gi1/0/2      this is test macro
--------------------------------------------------------------
```

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

```
Switch# show parser macro description interface gigabitethernet1/0/2
Interface    Macro Description
--------------------------------------------------------------
Gi1/0/2      this is test macro
--------------------------------------------------------------
```

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

show policy-map

Use the **show policy-map** user EXEC command to display quality of service (QoS) policy maps, which define classification criteria for incoming traffic. Policy maps can include policers that specify the bandwidth limitations and the action to take if the limits are exceeded.

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

Syntax Description

policy-map-name	(Optional) Display the specified policy-map name.
class *class-map-name*	(Optional) Display QoS policy actions for a individual class.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Note Though visible in the command-line help string, the **control-plane** and **interface** keywords are not supported, and the statistics shown in the display should be ignored.

Command Modes   User EXEC

Command History

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

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

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

```
Switch> show policy-map
Policy Map videowizard_policy2
  class  videowizard_10-10-10-10
    set dscp 34
    police 100000000 2000000 exceed-action drop

 Policy Map mypolicy
  class  dscp5
    set dscp 6
```

Related Commands	Command	Description
	policy-map	Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.

show port-security

Use the **show port-security** privileged EXEC command to display port-security settings for an interface or for the switch.

> **show port-security** [**interface** *interface-id*] [**address** | **vlan**] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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**.

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

Examples

This is an example of the output from the **show port-security** command:

```
Switch# show port-security
Secure Port      MaxSecureAddr  CurrentAddr  SecurityViolation  Security Action
                   (Count)        (Count)       (Count)
------------------------------------------------------------------------------
    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** user EXEC command 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*] [**|** {**begin** | **exclude** | **include**} *expression*]

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*	(Optional) Limit the display to ports on the specified stack member. The switch number is 1 to 9.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(19)EA1	This command was introduced.
12.2(25)SEC	The **consumption** keywords were added.

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

Examples   This is an example of output from the **show 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 2-35 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 2-35   show power inline interface Field Descriptions

Field	Description
Admin	Administration mode: auto, off, static
Oper	Operating mode: • on—the powered device is detected, and power is applied. • off—no PoE is applied. • faulty—device detection or a powered device is in a faulty state. • 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

Table 2-35 ***show power inline interface Field Descriptions (continued)***

Field	Description
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 sdm prefer

Use the **show sdm prefer** privileged EXEC command to display information about the Switch Database Management (SDM) templates that can be used to maximize used for allocating system resources for a particular feature, or use the command without a keyword to display the template in use.

> **show sdm prefer** [**access** | **default** | **dual-ipv4-and-ipv6** {**default** | **routing** | **vlan**} | **routing** | **vlan** [**desktop**]] [| {**begin** | **exclude** | **include**} *expression*]

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. • **default**—Display the default dual template configuration. • **routing**—Display the routing dual template configuration. • **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.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show sdm prefer** command, displaying the template in use:

```
Switch# show sdm prefer
The current template is "desktop default" template.
 The selected template optimizes the resources in
 the switch to support this level of features for
 8 routed interfaces and 1024 VLANs.

  number of unicast mac addresses:          6K
  number of 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 [**|** {**begin** | **exclude** | **include**} *expression*]

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

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 shell

Use the **show shell** privileged EXEC command to display shell information.

show shell [**environment | functions | triggers**] [| {**begin | exclude | include**} *expression*]

Syntax Description

environment	(Optional) Display shell environment information.
functions	(Optional) Display macro information.
triggers	(Optional) Display event trigger information.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes Privileged EXEC

Command History

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

Usage Guidelines Use this command to display the shell information for the switch.

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

Examples This example shows how to use the **show shell** *triggers* privileged EXEC command to view the event triggers in the switch software:

```
Switch# show shell triggers

User defined triggers
---------------------
Built-in triggers
-----------------
Trigger Id: CISCO_PHONE_EVENT
Trigger description: Event for ip-phone macro
Trigger environment: ACCESS_VLAN=1 VOICE_VLAN=2
Trigger mapping function: CISCO_PHONE_AUTO_SMARTPORT

Trigger Id: CISCO_ROUTER_EVENT
Trigger description: Event for router macro
Trigger environment: NATIVE_VLAN=1
Trigger mapping function: CISCO_ROUTER_AUTO_SMARTPORT

Trigger Id: CISCO_SWITCH_EVENT
Trigger description: Event for switch macro
Trigger environment: NATIVE_VLAN=1
Trigger mapping function: CISCO_SWITCH_AUTO_SMARTPORT
```

```
Trigger Id: CISCO_WIRELESS_AP_EVENT
Trigger description: Event for Wireless Access Point macro
Trigger environment: NATIVE_VLAN=1
Trigger mapping function: CISCO_AP_AUTO_SMARTPORT

Trigger Id: CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT
Trigger description: Event for Wireless Lightweight Access Point macro
Trigger environment: NATIVE_VLAN=1
Trigger mapping function: CISCO_LWAP_AUTO_SMARTPORT
```

This example shows how to use the **show shell** *functions* privileged EXEC command to view the built-in macros in the switch software:

```
Switch# show shell functions
#User defined functions:

#Built-in functions:
function CISCO_AP_AUTO_SMARTPORT () {
    if [[ $LINKUP -eq YES ]]; then
        conf t
            interface  $INTERFACE
                macro description $TRIGGER
                switchport trunk encapsulation dot1q
                switchport trunk native vlan $NATIVE_VLAN
                switchport trunk allowed vlan ALL
                switchport mode trunk
                switchport nonegotiate
                auto qos voip trust
                mls qos trust cos
            exit
        end
    fi
    if [[ $LINKUP -eq NO ]]; then
        conf t
            interface  $INTERFACE
                no macro description
                no switchport nonegotiate
                no switchport trunk native vlan $NATIVE_VLAN
                no switchport trunk allowed vlan ALL
                no auto qos voip trust
                no mls qos trust cos
                if [[ $AUTH_ENABLED -eq NO ]]; then
                    no switchport mode
                    no switchport trunk encapsulation
                fi
            exit
        end
    fi
}

function CISCO_SWITCH_AUTO_SMARTPORT () {
    if [[ $LINKUP -eq YES ]]; then
        conf t
            interface  $INTERFACE
                macro description $TRIGGER
                auto qos voip trust
                switchport trunk encapsulation dot1q
                switchport trunk native vlan $NATIVE_VLAN
                switchport trunk allowed vlan ALL
                switchport mode trunk
            exit
        end
    else
```

```
            conf t
                interface  $INTERFACE
                    no macro description
                    no auto qos voip trust
                    no switchport mode trunk
                    no switchport trunk encapsulation dot1q
                    no switchport trunk native vlan $NATIVE_VLAN
                    no switchport trunk allowed vlan ALL
                exit
            end
    fi
}

<output truncated>
```

Related Commands	Command	Description
	macro auto global processing	Enables Auto Smartports on a switch.
	macro auto execute	Defines mapping from an event trigger to a built-in macro.
	shell trigger	Creates an event trigger.

show spanning-tree

Use the **show spanning-tree** user EXEC command to display spanning-tree state information.

> **show spanning-tree** [*bridge-group* | **active** [**detail**] | **backbonefast** | **blockedports** | **bridge** | **detail** [**active**] | **inconsistentports** | **interface** *interface-id* | **mst** | **pathcost method** | **root** | **summary** [**totals**] | **uplinkfast** | **vlan** *vlan-id*] [| {**begin** | **exclude** | **include**} *expression*]

> **show spanning-tree** *bridge-group* [**active** [**detail**] | **blockedports** | **bridge** | **detail** [**active**] | **inconsistentports** | **interface** *interface-id* | **root** | **summary**] [| {**begin** | **exclude** | **include**} *expression*]

> **show spanning-tree vlan** *vlan-id* [**active** [**detail**] | **blockedports** | **bridge** | **detail** [**active**] | **inconsistentports** | **interface** *interface-id* | **root** | **summary**] [| {**begin** | **exclude** | **include**} *expression*]

> **show spanning-tree** {**vlan** *vlan-id* | *bridge-group*} **bridge** [**address** | **detail** | **forward-time** | **hello-time** | **id** | **max-age** | **priority** [**system-id**] | **protocol**] [| {**begin** | **exclude** | **include**} *expression*]

> **show spanning-tree** {**vlan** *vlan-id* | *bridge-group*} **root** [**address** | **cost** | **detail** | **forward-time** | **hello-time** | **id** | **max-age** | **port** | **priority** [**system-id**] [| {**begin** | **exclude** | **include**} *expression*]

> **show spanning-tree interface** *interface-id* [**active** [**detail**] | **cost** | **detail** [**active**] | **inconsistency** | **portfast** | **priority** | **rootcost** | **state**] [| {**begin** | **exclude** | **include**} *expression*]

> **show spanning-tree mst** [**configuration** [digest]] | [*instance-id* [**detail** | **interface** *interface-id* [**detail**]] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description		
	bridge-group	(Optional) Specify the bridge group number. The range is 1 to 255.
	active [**detail**]	(Optional) Display spanning-tree information only on active interfaces (available only in privileged EXEC mode).
	backbonefast	(Optional) Display spanning-tree BackboneFast status.
	blockedports	(Optional) Display blocked port information (available only in privileged EXEC mode).
	bridge [**address** | **detail** | **forward-time** | **hello-time** | **id** | **max-age** | **priority** [**system-id**] | **protocol**]	(Optional) Display status and configuration of this switch (optional keywords available only in privileged EXEC mode).
	detail [**active**]	(Optional) Display a detailed summary of interface information (**active** keyword available only in privileged EXEC mode).
	inconsistentports	(Optional) Display inconsistent port information (available only in privileged EXEC mode).
	interface *interface-id* [**active** [**detail**] | **cost** | **detail** [**active**] | **inconsistency** | **portfast** | **priority** | **rootcost** | **state**]	(Optional) Display spanning-tree information for the specified interface (all options except **portfast** and **state** available only in privileged EXEC mode). Enter each interface separated by a space. Ranges are not supported. Valid interfaces include physical ports, VLANs, and port channels. The VLAN range is 1 to 4094. The port-channel range is 1 to 48.

mst [**configuration** [**digest**]] [*instance-id* [**detail** | **interface** *interface-id* [**detail**]]	(Optional) Display the multiple spanning-tree (MST) region configuration and status (available only in privileged EXEC mode).
	The keywords have these meanings:
	• **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).
	The terminology was updated for the implementation of the IEEE standard, and the *txholdcount* field was added.
	The new master role appears for boundary ports.
	The word *pre-standard* or *Pre-STD* appears when an IEEE standard bridge sends prestandard BPDUs on a port.
	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.
	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.
	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.
	• *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.
	• **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.
	• **detail**—(Optional) Display detailed information for the instance or interface.
pathcost method	(Optional) Display the default path cost method (available only in privileged EXEC mode).
root [**address** | **cost** | **detail** | **forward-time** | **hello-time** | **id** | **max-age** | **port** | **priority** [**system-id**]]	(Optional) Display root switch status and configuration (all keywords available only in privileged EXEC mode).
summary [**totals**]	(Optional) Display a summary of port states or the total lines of the spanning-tree state section. The words *IEEE Standard* identify the MST version running on a switch.
uplinkfast	(Optional) Display spanning-tree UplinkFast status.
vlan *vlan-id* [**active** [**detail**] | **backbonefast** | **blockedports** | **bridge** [**address** | **detail** | **forward-time** | **hello-time** | **id** | **max-age** | **priority** [**system-id**] | **protocol**]	(Optional) Display spanning-tree information for the specified VLAN (some keywords available only in privileged EXEC mode). You can specify a single VLAN identified by VLAN ID number, a range of VLANs separated by a hyphen, or a series of VLANs separated by a comma. The range is 1 to 4094.

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

Command Modes   User EXEC

Command History

Release	Modification
12.1(11)AX	This command was introduced.
12.1(14)EA1	The **mst** keyword and options were added.
12.2(25)SEC	The **digest** keyword was added, and new digest and transmit hold count fields appear.

Usage Guidelines   If the *vlan-id* variable is omitted, the command applies to the spanning-tree instance for all VLANs.

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

Examples   This is an example of output from the **show spanning-tree active** command:

```
Switch# show spanning-tree active
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32768
             Address     0001.42e2.cdd0
             Cost        3038
             Port        24 (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.

Command	Description
spanning-tree loopguard default	Prevents alternate or root ports from becoming the designated port because of a failure that leads to a unidirectional link.
spanning-tree mst configuration	Enters multiple spanning-tree (MST) configuration mode through which the MST region configuration occurs.
spanning-tree mst cost	Sets the path cost for MST calculations.
spanning-tree mst forward-time	Sets the forward-delay time for all MST instances.
spanning-tree mst hello-time	Sets the interval between hello BPDUs sent by root switch configuration messages.
spanning-tree mst max-age	Sets the interval between messages that the spanning tree receives from the root switch.
spanning-tree mst max-hops	Sets the number of hops in an MST region before the BPDU is discarded and the information held for an interface is aged.
spanning-tree mst port-priority	Configures an interface priority.
spanning-tree mst priority	Configures the switch priority for the specified spanning-tree instance.
spanning-tree mst root	Configures the MST root switch priority and timers based on the network diameter.
spanning-tree port-priority	Configures an interface priority.
spanning-tree portfast (global configuration)	Globally enables the BPDU filtering or the BPDU guard feature on Port Fast-enabled interfaces or enables the Port Fast feature on all nontrunking interfaces.
spanning-tree portfast (interface configuration)	Enables the Port Fast feature on an interface and all its associated VLANs.
spanning-tree uplinkfast	Accelerates the choice of a new root port when a link or switch fails or when the spanning tree reconfigures itself.
spanning-tree vlan	Configures spanning tree on a per-VLAN basis.

show storm-control

Use the **show storm-control** user EXEC command to display broadcast, multicast, or unicast storm control settings on the switch or on the specified interface or to display storm-control history.

> **show storm-control** [*interface-id*] [**broadcast** | **multicast** | **unicast**] [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

interface-id	(Optional) Interface ID for the physical port (including type, 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

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.

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

Examples   This is an example of a partial output from the **show storm-control** command when no keywords are entered. Because no traffic-type keyword was entered, the broadcast storm control settings appear.

```
Switch> show storm-control
Interface     Filter State  Upper       Lower      Current
---------     -------------  ----------  ---------  ---------
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> show storm-control gigabitethernet 1/0/1
Interface     Filter State   Upper       Lower       Current
---------     -------------  ----------  ---------   ---------
Gi1/0/1       Forwarding     20 pps      10 pps      5 pps
```

Table 2-36 describes the fields in the **show storm-control** display.

Table 2-36   show storm-control Field Descriptions

Field	Description
Interface	Displays the ID of the interface.
Filter State	Displays the status of the filter: • Blocking—Storm control is enabled, and a storm has occurred. • Forwarding—Storm control is enabled, and no storms have occurred. • 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** user EXEC command 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**]] [| {**begin** | **exclude** | **include**} *expression*]

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 [**summary**]	(Optional) Display port information for the entire stack. Use the **summary** keyword to 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.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

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

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 2-37 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 2-37   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. • Down—A cable is detected, but either no connected neighbor is up, or the StackWise port is disabled. • 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. 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 2-37   show switch stack-ports summary Command Output (continued)

Field	Description
Li nk OK	This shows if the link is stable.
	The *link partner* is a StackWise port on a neighbor switch.
	• No—The link partner receives invalid protocol messages from the port.
	• 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.
	• No—The port cannot send traffic to the link partner.
	• 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.
	• Yes—The link partner sends valid protocol messages to the port.
# Changes to LinkOK	This shows the relative stability of the link.
	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.
	• 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 [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show system mtu** command:

```
Switch# show system mtu
System MTU size is 1500 bytes
System Jumbo MTU size is 1550 bytes
Routing MTU size is 1500 bytes.
```

Related Commands

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

show udld

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

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

Syntax Description

interface-id	(Optional) ID of the interface and port number. Valid interfaces include physical ports and VLANs. The VLAN range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   User EXEC

Command History

Release	Modification
12.1(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.

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

Examples   This is an example of output from the **show udld** *interface-id* command. For this display, UDLD is enabled on both ends of the link, and UDLD detects that the link is bidirectional. Table 2-38 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 2-38   show udld Field Descriptions

Field	Description
Interface	The interface on the local device configured for UDLD.
Port enable administrative configuration setting	How UDLD is configured on the port. If UDLD is enabled or disabled, the port enable configuration setting is the same as the operational enable state. Otherwise, the enable operational setting depends on the global enable setting.
Port enable operational state	Operational state that shows whether UDLD is actually running on this port.
Current bidirectional state	The bidirectional state of the link. An unknown state appears if the link is down or if it is connected to an UDLD-incapable device. A bidirectional state appears if the link is a normal two-way connection to a UDLD-capable device. All other values mean miswiring.
Current operational state	The current phase of the UDLD state machine. For a normal bidirectional link, the state machine is most often in the Advertisement phase.
Message interval	How often advertisement messages are sent from the local device. Measured in seconds.
Time out interval	The time period, in seconds, that UDLD waits for echoes from a neighbor device during the detection window.
Entry 1	Information from the first cache entry, which contains a copy of echo information received from the neighbor.
Expiration time	The amount of time in seconds remaining before this cache entry is aged out.
Device ID	The neighbor device identification.
Current neighbor state	The neighbor's current state. If both the local and neighbor devices are running UDLD normally, the neighbor state and local state should be bidirectional. If the link is down or the neighbor is not UDLD-capable, no cache entries appear.
Device name	The device name or the system serial number of the neighbor. The system serial number appears if the device name is not set or is set to the default (Switch).
Port ID	The neighbor port ID enabled for UDLD.
Neighbor echo 1 device	The device name of the neighbors' neighbor from which the echo originated.
Neighbor echo 1 port	The port number ID of the neighbor from which the echo originated.
Message interval	The rate, in seconds, at which the neighbor is sending advertisement messages.
CDP device name	The CDP device name or the system serial number. The system serial number appears if the device name is not set or is set to the default (Switch).

Related Commands	Command	Description
	udld	Enables aggressive or normal mode in UDLD or sets the configurable message timer time.
	udld port	Enables UDLD on an individual interface or prevents a fiber-optic interface from being enabled by the **udld** global configuration command.
	udld reset	Resets all interfaces shutdown by UDLD and permits traffic to begin passing through them again.

show version

Use the **show version** user EXEC command to display version information for the hardware and firmware.

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

Syntax Description

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

Command Modes   User EXEC

Command History

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

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

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

✎
Note   Though visible in the **show version** output, the *configuration register* information is not supported on the switch.

```
Switch> show version
Cisco 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** user EXEC command to display the parameters for all configured VLANs or one VLAN (if the VLAN ID or name is specified) on the switch.

show vlan [**brief** | **dot1q tag native** | **id** *vlan-id* | **internal usage** | **mtu** | **name** *vlan-name* | **private-vlan** [**type**] | **remote-span** | **summary**] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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, formerly known as the enhanced multilayer image (EMI).
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.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

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

Command Modes   User EXEC

Command History

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

Release	Modification
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*.

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

Examples

This is an example of output from the **show vlan** command. Table 2-39 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, Fa11/0/21, 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 2-39   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, Fa1/0/20, Fa1/0/22, Gi1/0/1, Fa2/0/13,
                                   Fa2/0/22, Fa3/0/13, Fa3/0/14, Fa3/0/20, Gi3/0/1
20       30       community        Fa1/0/13, Fa1/0/20, Fa1/0/21, Gi1/0/1, Fa2/0/13,
                                   Fa2/0/20, Fa3/0/14, Fa3/0/20, Fa3/0/21, Gi3/0/1
20       35       community        Fa1/0/13, Fa1/0/20, Fa1/0/23, Fa1/0/33. Gi1/0/1,
                                   Fa2/0/13, Fa3/0/14, Fa3/0/20. Fa3/0/23, Fa3/0/33,
                                   Gi3/0/1
20       55       non-operational
2000    2500      isolated         Fa1/0/5, Fa1/0/10, Fa2/0/5, Fa2/0/10, Fa2/0/15
```

This is an example of output from the **show vlan private-vlan type** command:

```
Switch> show vlan private-vlan type
Vlan Type
---- ----------------
10   primary
501  isolated
502  community
503  normal
```

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

```
Switch> show vlan summary
Number of existing VLANs        : 45
 Number of existing VTP VLANs   : 45
 Number of existing extended VLANs : 0
```

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.
vlan (global configuration)	Enables VLAN configuration mode where you can configure VLANs 1 to 4094.
vlan (VLAN configuration)	Configures VLAN characteristics in the VLAN database. Only available for normal-range VLANs (VLAN IDs 1 to 1005). Do not enter leading zeros.

show vlan access-map

Use the **show vlan access-map** privileged EXEC command to display information about a particular VLAN access map or for all VLAN access maps.

show vlan access-map [*mapname*] [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description		
	mapname	(Optional) Name of a specific VLAN access map.
	| begin	(Optional) Display begins with the line that matches the *expression*.
	| exclude	(Optional) Display excludes lines that match the *expression*.
	| include	(Optional) Display includes lines that match the specified *expression*.
	expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.1(11)AX	This command was introduced.

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

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

```
Switch# show vlan access-map
Vlan access-map "SecWiz"  10
  Match clauses:
    ip  address: SecWiz_Gi0_3_in_ip
    ip  address: SecWiz_Fa10_3_in_ip

  Action:
    forward
```

Related Commands	Command	Description
	show vlan filter	Displays information about all VLAN filters or about a particular VLAN or VLAN access map.
	vlan access-map	Creates a VLAN map entry for VLAN packet filtering.
	vlan filter	Applies a VLAN map to one or more VLANs.

show vlan filter

Use the **show vlan filter** privileged EXEC command to display information about all VLAN filters or about a particular VLAN or VLAN access map.

show vlan filter [**access-map** *name* | **vlan** *vlan-id*] [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

access-map *name*	(Optional) Display filtering information for the specified VLAN access map.
vlan *vlan-id*	(Optional) Display filtering information for the specified VLAN. The range is 1 to 4094.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes   Privileged EXEC

Command History

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

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

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

```
Switch# show vlan filter
VLAN Map map_1 is filtering VLANs:
  20-22
```

Related Commands

Command	Description
show vlan access-map	Displays information about a particular VLAN access map or for all VLAN access maps.
vlan access-map	Creates a VLAN map entry for VLAN packet filtering.
vlan filter	Applies a VLAN map to one or more VLANs.

show vmps

Use the **show vmps** user EXEC command without keywords to display the VLAN Query Protocol (VQP) version, reconfirmation interval, retry count, VLAN Membership Policy Server (VMPS) IP addresses, and the current and primary servers, or use the **statistics** keyword to display client-side statistics.

show vmps [**statistics**] [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

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

Command Modes

User EXEC

Command History

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

Usage Guidelines

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

Examples

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

```
Switch> show vmps
VQP Client Status:
--------------------
VMPS VQP Version:   1
Reconfirm Interval: 60 min
Server Retry Count: 3
VMPS domain server:

Reconfirmation status
--------------------
VMPS Action:         other
```

This is an example of output from the **show vmps statistics** command. Table 2-40 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 2-40   show vmps statistics Field Descriptions

Field	Description
VQP Queries	Number of queries sent by the client to the VMPS.
VQP Responses	Number of responses sent to the client from the VMPS.
VMPS Changes	Number of times that the VMPS changed from one server to another.
VQP Shutdowns	Number of times the VMPS sent a response to shut down the port. The client disables the port and removes all dynamic addresses on this port from the address table. You must administratively re-enable the port to restore connectivity.
VQP Denied	Number of times the VMPS denied the client request for security reasons. When the VMPS response denies an address, no frame is forwarded to or from the workstation with that address (broadcast or multicast frames are delivered to the workstation if the port has been assigned to a VLAN). The client keeps the denied address in the address table as a blocked address to prevent more queries from being sent to the VMPS for each new packet received from this workstation. The client ages the address if no new packets are received from this workstation on this port within the aging time period.
VQP Wrong Domain	Number of times the management domain in the request does not match the one for the VMPS. Any previous VLAN assignments of the port are not changed. This response means that the server and the client have not been configured with the same VTP management domain.
VQP Wrong Version	Number of times the version field in the query packet contains a value that is higher than the version supported by the VMPS. The VLAN assignment of the port is not changed. The switches send only VMPS Version 1 requests.
VQP Insufficient Resource	Number of times the VMPS is unable to answer the request because of a resource availability problem. If the retry limit has not yet been reached, the client repeats the request with the same server or with the next alternate server, depending on whether the per-server retry count has been reached.

Related Commands	Command	Description
	clear vmps statistics	Clears the statistics maintained by the VQP client.
	vmps reconfirm (privileged EXEC)	Sends VQP queries to reconfirm all dynamic VLAN assignments with the VMPS.
	vmps retry	Configures the per-server retry count for the VQP client.
	vmps server	Configures the primary VMPS and up to three secondary servers.

show vtp

Use the **show vtp** user EXEC command to display general information about the VLAN Trunking Protocol (VTP) management domain, status, and counters.

show vtp {**counters** | **password** | **status**} [| {**begin** | **exclude** | **include**} *expression*]

Syntax Description

counters	Display the VTP statistics for the switch.
password	Display the configured VTP password.
status	Display general information about the VTP management domain status.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes

User EXEC

Command History

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

Usage Guidelines

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

Examples

This is an example of output from the **show vtp counters** command. Table 2-41 describes each field in the display.

```
Switch> show vtp counters

VTP statistics:
Summary advertisements received    : 0
Subset advertisements received     : 0
Request advertisements received    : 0
Summary advertisements transmitted : 0
Subset advertisements transmitted  : 0
Request advertisements transmitted : 0
Number of config revision errors   : 0
Number of config digest errors     : 0
Number of V1 summary errors        : 0
```

```
VTP pruning statistics:

Trunk            Join Transmitted Join Received    Summary advts received from
                                                   non-pruning-capable device
---------------- ---------------- ---------------- --------------------------
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 2-41   show vtp counters Field Descriptions

Field	Description
Summary advertisements received	Number of summary advertisements received by this switch on its trunk ports. Summary advertisements contain the management domain name, the configuration revision number, the update timestamp and identity, the authentication checksum, and the number of subset advertisements to follow.
Subset advertisements received	Number of subset advertisements received by this switch on its trunk ports. Subset advertisements contain all the information for one or more VLANs.
Request advertisements received	Number of advertisement requests received by this switch on its trunk ports. Advertisement requests normally request information on all VLANs. They can also request information on a subset of VLANs.
Summary advertisements transmitted	Number of summary advertisements sent by this switch on its trunk ports. Summary advertisements contain the management domain name, the configuration revision number, the update timestamp and identity, the authentication checksum, and the number of subset advertisements to follow.
Subset advertisements transmitted	Number of subset advertisements sent by this switch on its trunk ports. Subset advertisements contain all the information for one or more VLANs.
Request advertisements transmitted	Number of advertisement requests sent by this switch on its trunk ports. Advertisement requests normally request information on all VLANs. They can also request information on a subset of VLANs.
Number of configuration revision errors	Number of revision errors. 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. 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. These errors means that the switch is filtering incoming advertisements, which causes the VTP database to become unsynchronized across the network.

Table 2-41   show vtp counters Field Descriptions (continued)

Field	Description
Number of configuration digest errors	Number of MD5 digest errors.
	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.
	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.
	Version 1 summary errors increment whenever a switch in VTP V2 mode receives a VTP Version 1 frame. These errors mean that at least one neighboring switch is either running VTP Version 1 or VTP Version 2 with V2-mode disabled. To solve this problem, change the configuration of the switches in VTP V2-mode to disabled.
Join Transmitted	Number of VTP pruning messages sent on the trunk.
Join Received	Number of VTP pruning messages received on the trunk.
Summary Advts Received from non-pruning-capable device	Number of VTP summary messages received on the trunk from devices that do not support pruning.

This is an example of output from the **show vtp status** command. Table 2-42 describes each field in the display.

```
Switch> show vtp status
VTP Version                   : 2
Configuration Revision        : 0
Maximum VLANs supported locally : 1005
Number of existing VLANs      : 45
VTP Operating Mode            : Transparent
VTP Domain Name               : shared_testbed1
VTP Pruning Mode              : Disabled
VTP V2 Mode                   : Disabled
VTP Traps Generation          : Enabled
MD5 digest                    : 0x3A 0x29 0x86 0x39 0xB4 0x5D 0x58 0xD7
```

Table 2-42   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.
	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.
	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.
	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.
	Transparent: a switch in VTP transparent mode is disabled for VTP, does not send or learn from advertisements sent by other devices, and cannot affect VLAN configurations on other devices in the network. The switch receives VTP advertisements and forwards them on all trunk ports except the one on which the advertisement was received.
VTP Domain Name	Name that identifies the administrative domain for the switch.
VTP Pruning Mode	Displays whether pruning is enabled or disabled. Enabling pruning on a VTP server enables pruning for the entire management domain. Pruning restricts flooded traffic to those trunk links that the traffic must use to access the appropriate network devices.
VTP V2 Mode	Displays if VTP Version 2 mode is enabled. All VTP Version 2 switches operate in Version 1 mode by default. Each VTP switch automatically detects the capabilities of all the other VTP devices. A network of VTP devices should be configured to Version 2 only if all VTP switches in the network can operate in Version 2 mode.
VTP Traps Generation	Displays whether VTP traps are sent to a network management station.
MD5 Digest	A 16-byte checksum of the VTP configuration.
Configuration Last Modified	Displays the date and time of the last configuration modification. Displays the IP address of the switch that caused the configuration change to the database.

Related Commands

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

show vtp