rmon collection stats

Use the `rmon collection stats` interface configuration command to collect Ethernet group statistics, which include utilization 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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>index</code></td>
<td>Remote Network Monitoring (RMON) collection control index. The range is 1 to 65535.</td>
</tr>
<tr>
<td><code>owner name</code></td>
<td>(Optional) Owner of the RMON collection.</td>
</tr>
</tbody>
</table>

**Note**

Though visible in the command-line help, the `rmon native` and `rmon promiscuous` commands are not supported.

**Defaults**

The RMON statistics collection is disabled.

**Command Modes**

Interface configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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` on a port:

```
Switch(config)# interface gigabitethernet1/0/1
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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
</table>
sdm prefer

Use the `sdm prefer` global configuration command to configure the template used in the 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 utilization for routing or for VLAN configuration. Use the `no` form of this command to return to the default template.

```
  sdm prefer { default | routing | vlan }
```

```
  no sdm prefer
```

**Note**

Though visible in the command-line help string, the `dual-ipv4-and-ipv6` keywords are not supported.

**Syntax Description**

- **default**
  
  Set the switch to use the default template to balance resources among features.

- **routing**
  
  Provide maximum system utilization for unicast routing. You would typically use this template for a router or aggregator in the middle of a network.

  **Note**

  This template does not support policy-based routing.

- **vlan**
  
  Provide maximum system utilization for VLANs. This template maximizes system resources for use as a Layer 2 switch with no routing.

**Defaults**

The default template provides a balance to all features.

**Command Modes**

Global configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>The <code>routing-pbr</code> keywords for configuring the policy-based routing template were removed. This template is no longer required for policy-based routing.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

You must reload the switch for the configuration to take effect.

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

Do not use the routing template if you do not have routing enabled on your switch. Entering the `sdm prefer routing` global configuration command prevents other features from using the memory allocated to unicast routing in the routing template.
Table 2-17 lists the approximate number of each resource supported in each of the three templates for a switch. The first eight rows in the tables (unicast MAC addresses through security access control entries [ACEs]) represent approximate hardware boundaries set when you select a template. If a section of a hardware resource is full, all processing overflow is sent to the CPU, seriously impacting switch performance. The last row is a guideline used to calculate hardware resource consumption related to the other resource parameters.

**Table 2-17 Approximate Number of Feature Resources Allowed by Each Template**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Default</th>
<th>Routing</th>
<th>VLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unicast MAC addresses</td>
<td>6 K</td>
<td>3 K</td>
<td>12 K</td>
</tr>
<tr>
<td>Internet Group Management Protocol (IGMP) groups and multicast routes</td>
<td>1 K</td>
<td>1 K</td>
<td>1 K</td>
</tr>
<tr>
<td>Unicast routes</td>
<td>8 K</td>
<td>11 K</td>
<td>0</td>
</tr>
<tr>
<td>• Directly connected hosts</td>
<td>6 K</td>
<td>3 K</td>
<td>0</td>
</tr>
<tr>
<td>• Indirect routes</td>
<td>2 K</td>
<td>8 K</td>
<td>0</td>
</tr>
<tr>
<td>Policy-based routing ACEs</td>
<td>0</td>
<td>512</td>
<td>0</td>
</tr>
<tr>
<td>Quality of service (QoS) classification ACEs</td>
<td>512</td>
<td>512</td>
<td>512</td>
</tr>
<tr>
<td>Security ACEs</td>
<td>1 K</td>
<td>1 K</td>
<td>1 K</td>
</tr>
<tr>
<td>Layer 2 VLANs</td>
<td>1 K</td>
<td>1 K</td>
<td>1 K</td>
</tr>
</tbody>
</table>

**Examples**

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

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

This example shows how to change a switch template to the default template.

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

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

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show sdm prefer</td>
<td>Displays the current SDM template in use or displays the templates that can be used, with approximate resource allocation per feature.</td>
</tr>
</tbody>
</table>
service instance

Use the `service instance` interface configuration command to configure an Ethernet service instance on the interface and to enter Ethernet service configuration mode. Use the `no` form of this command to delete the service instance.

```
service instance id ethernet [evc-id]
no service instance id
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>id</code></td>
<td>Define a service instance identifier, a per-interface service identifier that does not map to a VLAN. The range is 1 to 4294967295.</td>
</tr>
<tr>
<td><code>ethernet</code></td>
<td>Identify the service instance as an Ethernet instance.</td>
</tr>
<tr>
<td><code>evc-id</code></td>
<td>(Optional) Attach an Ethernet virtual connection (EVC) to the service instance.</td>
</tr>
</tbody>
</table>

**Defaults**

No Ethernet service instances are defined.

**Command Modes**

Interface configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SEG</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

After you enter the `service instance id ethernet` command, the switch enters Ethernet service configuration mode, and these configuration commands are available:

- `default`: sets the service instance to its default state.
- `ethernet lmi ce-vlan map`: configures Ethernet Local Management Interface (LMI) parameters. See the `ethernet lmi ce-vlan map` command.
- `exit`: exits EVC configuration mode and returns to global configuration mode.
- `no`: negates a command or returns a command to its default setting.

**Examples**

This example shows how to define an Ethernet service instance and to enter Ethernet service configuration mode for EVC `test`:

```
Switch(config-if)# service instance 333 ethernet test
Switch(config-if-srv)#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show ethernet service instance</code></td>
<td>Displays information about configured Ethernet service instances.</td>
</tr>
</tbody>
</table>
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 boot process while the switch is powering up and to assign a new password. Use the **no** form of this command to disable part of the password-recovery functionality. When the password-recovery mechanism is disabled, interrupting the boot process is allowed only if the user agrees to set the system back to the default configuration.

```
  service password-recovery
  no service password-recovery
```

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

**Defaults**
The password-recovery mechanism is enabled.

**Command Modes**
Global configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 goes 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)?
```

If the user chooses not to reset the system back to the default configuration, the normal boot process continues, as if the **Mode** button had not been pressed. If you choose to reset the system back to the default configuration, the configuration file in flash memory is deleted, and the VLAN database file, flash:vlan.dat (if present), is deleted.
Note

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

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

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

Examples

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

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

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show version</td>
<td>Displays version information for the hardware and firmware.</td>
</tr>
</tbody>
</table>
service-policy (interface configuration)

Use the service-policy interface configuration command to apply a policy map defined by the policy-map command to a 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 | output } policy-map-name

no service-policy { input | output } policy-map-name
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>input policy-map-name</td>
<td>Apply the specified single-level ingress policy map to a standard or to an enhanced-services (ES) port. Apply the specified hierarchical policy map to the input of an enhanced-services (ES) port or Etherchannel made of ES ports.</td>
</tr>
<tr>
<td>output policy-map-name</td>
<td>Apply the specified single-level or hierarchical policy map to the output of an ES port or Etherchannel.</td>
</tr>
</tbody>
</table>

**Note**

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

**Defaults**

No policy maps are attached to the port.

**Command Modes**

Interface configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>Hierarchical service policies can be attached to inbound or outbound traffic on an ES port. Nonhierarchical dual-level service policies can attached to inbound traffic received on a switch virtual interface (SVI).</td>
</tr>
<tr>
<td>12.2(25)SE</td>
<td>Hierarchical service policies can be attached to an EtherChannel with no ports or with one or both ES ports</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Only one policy map per port is supported. With standard QoS, you can attach one nonhierarchical service policy to the input of a standard physical port, to an SVI, or to an ES port. You can also attach one ingress hierarchical dual-level service policy per SVI. With hierarchical QoS, you can attach one ingress hierarchical service policy and one egress hierarchical service policy per ES port. You can also attach a hierarchical service policy to an EtherChannel with no ports or with one or both ES ports.

Use the service-policy output policy-map-name command only in an egress policy map attached to an ES port. You cannot apply an egress policy to a standard port.
In software releases earlier than Cisco IOS Release 12.2(25)EY, policy maps can be configured only on physical ports. In Cisco IOS Release 12.2(25)EY or later, 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 dual-level policy map is configured and applied on an SVI, the interface-level policy map takes effect on the interface.

In software releases earlier than Cisco IOS Release 12.2(25)EY, you can apply a policy map only to the input of a physical port. In Cisco IOS Release 12.2(25)EY or later, you can apply a policy map to the input of a physical port or an SVI.

In Cisco IOS Release 12.2(35)SE or later, you can attach a hierarchical policy map to an EtherChannel made of ES ports.

When applying an ingress nonhierarchical policy map to a physical interface or an SVI or when applying an egress hierarchical policy map to a ES port, 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. However, if you are applying an ingress hierarchical policy to an ES port that includes the `set policy-map class configuration command or policing actions in a two-rate policer, the switch automatically applies a port trust state to the ES port. For example, if you configure the `set cos new-cos` command, the switch automatically configures the interface to trust CoS.

You can attach single-level policy maps as input policies on a standard ports or as input or output policies on ES ports. You cannot apply a single-level policy map to an egress standard port.

You can attach hierarchical policy maps as input or output policies on ES ports or ES EtherChannels. You cannot attach hierarchical policy maps to standard ports.

In releases earlier than Cisco IOS Release 12.2(35)SE, the switch does not support attaching a service policy to a logical interface (such as an EtherChannel). In these releases, you must configure quality of service (QoS) classification, policing, mapping, and queueing on the individual physical ports that comprise the EtherChannel. In Cisco IOS Release 12.2(35) or later, you can configure hierarchical policy maps on EtherChannels made of ES ports.

**Examples**

This example shows how to apply a policy map to the input of a standard port:

```bash
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# service-policy input plcmap1
```

This example shows how to apply a policy map to the output of an ES port:

```bash
Switch(config)# interface gigabitethernet1/1/1
Switch(config-if)# service-policy output plcmap3
```

You can verify your settings by entering the `show running-config` privileged EXEC command.
<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>policy-map</td>
<td>Creates or modifies a policy map that can be attached to multiple ports to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>specify a service policy.</td>
</tr>
<tr>
<td></td>
<td>show policy-map</td>
<td>Displays QoS policy maps.</td>
</tr>
<tr>
<td></td>
<td>show running-config</td>
<td>Displays the current operating configuration. For syntax information, select</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cisco IOS Configuration Fundamentals Command Reference, Release 12.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; File Management Commands &gt; Configuration File Management Commands.</td>
</tr>
</tbody>
</table>
service-policy (policy-map class)

Use the `service-policy` policy-map class configuration command to create a service policy that is a quality of service (QoS) policy within a policy map (called a hierarchical service policy). Use the `no` form of this command to disable the service policy within a policy map.

```
service-policy policy-map-name

no service-policy policy-map-name
```

**Syntax Description**

| `policy-map-name` | Name of the policy map. |

** Defaults**

No service policies maps are defined.

**Command Modes**

Policy-map class configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>Hierarchical service policies can be attached to inbound traffic received on an ES port or a switch virtual interface (SVI).</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the `service-policy` command only in a hierarchical policy map attached to an enhanced-services (ES) port. This command is valid in policy maps at any level of the hierarchy.

You can create a hierarchy by associating a class-level policy map with a VLAN-level policy map, by associating that VLAN-level policy map with a physical-level policy map, and by attaching the physical-level policy map to an ES port. You can omit hierarchical levels, but the order of the levels (class level, VLAN level, and then the physical level) must be preserved.

If you use the `bandwidth` policy-map class configuration command in a child policy, you also must use it in the parent policy.

If you enter this command in policy-map class configuration mode, you return to policy-map configuration mode by using the `exit` command. To return to privileged EXEC mode, use the `end` command.

**Examples**

This example shows how to create a hierarchical service policy in the service policy called `parent`:

```
Switch(config)# policy-map child
Switch(config-pmap)# class voice
Switch(config-pmap-c)# priority
Switch(config-pmap-c)# exit
Switch(config-pmap)# exit
Switch(config)# policy-map parent
Switch(config-pmap)# class class1
Switch(config-pmap-c)# shape average 10000000
Switch(config-pmap-c)# service-policy child
```
This example shows how to create a hierarchical service policy in which all levels are present. This configuration associates a class-level policy map with a VLAN-level policy map, associates the VLAN-level policy map with a physical-level policy map, and attaches the physical-level policy map to a port.

```
Switch(config)# class-map my-class
Switch(config-cmap)# match ip precedence 1
Switch(config-cmap)# exit
Switch(config)# class-map my-logical-class
Switch(config-cmap)# match vlan 5
Switch(config-cmap)# exit
Switch(config)# policy-map my-class-policy
Switch(config-pmap)# class my-class
Switch(config-pmap-c)# set precedence 2
Switch(config-pmap-c)# exit
Switch(config-cmap)# exit
Switch(config)# policy-map my-logical-policy
Switch(config-pmap)# class my-logical-class
Switch(config-pmap-c)# shape average 400000000
Switch(config-pmap-c)# service-policy my-class-policy
Switch(config-pmap-c)# exit
Switch(config-pmap)# exit
Switch(config)# policy-map my-physical-policy
Switch(config-pmap)# class class-default
Switch(config-pmap-c)# shape average 500000000
Switch(config-pmap-c)# service-policy my-logical-policy
Switch(config-pmap-c)# exit
Switch(config-pmap)# exit
Switch(config)# interface gigabitethernet1/1/1
Switch(config)# service-policy input my-physical-policy
```

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

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bandwidth</td>
<td>Specifies or modifies the minimum bandwidth provided to a class belonging to a policy map attached to an ES port.</td>
</tr>
<tr>
<td>class</td>
<td>Specifies the name of the class whose traffic policy you want to create or change.</td>
</tr>
<tr>
<td>policy-map</td>
<td>Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.</td>
</tr>
<tr>
<td>priority</td>
<td>Enables the strict-priority queue and gives priority to a class of traffic belonging to a policy map attached to an ES port.</td>
</tr>
<tr>
<td>queue-limit</td>
<td>Configures the maximum threshold for tail drop in a policy map attached to an ES port.</td>
</tr>
<tr>
<td>random-detect</td>
<td>Configures Weighted Random Early Detection (WRED) in a policy map attached to an ES port.</td>
</tr>
<tr>
<td>shape</td>
<td>Enables traffic shaping in a policy map attached to an ES port.</td>
</tr>
<tr>
<td>show policy-map</td>
<td>Displays QoS policy maps.</td>
</tr>
</tbody>
</table>
set

Use the `set` policy-map class configuration command to classify IP traffic by setting a class of service (CoS), a Differentiated Services Code Point (DSCP), an IP-precedence, or the multiprotocol label switching (MPLS) experimental (EXP) bits in the packet. Use the `no` form of this command to remove the traffic classification.

```
set {cos new-cos | [ip] {dscp new-dscp | precedence new-precedence} | mpls experimental exp-number}
```

Use the `no` form of this command to remove the traffic classification.

```
no set cos new-cos | ip {dscp new-dscp | precedence new-precedence} | mpls experimental exp-number}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cos new-cos</code></td>
<td>New CoS value assigned to the classified traffic. The range is 0 to 7.</td>
</tr>
<tr>
<td><code>ip dscp new-dscp</code></td>
<td>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. The specified value sets the type of service (ToS) byte in the packet header.</td>
</tr>
<tr>
<td><code>ip precedence new-precedence</code></td>
<td>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. The specified value sets the precedence bit in the IP header.</td>
</tr>
<tr>
<td><code>mpls experimental exp-number</code></td>
<td>New MPLS experimental value assigned to the classified traffic. The range is 0 to 7. The specified value sets the MPLS experimental 3-bit field in the packet header.</td>
</tr>
</tbody>
</table>

**Defaults**

No traffic classification is defined.

**Command Modes**

Policy-map class configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>Hierarchical service policies can be attached to inbound traffic received on an ES port.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

You can use the `set` command only in class-level classes.

The `set dscp new-dscp` and the `set precedence new-precedence` commands are the same as the `set ip dscp new-dscp` and the `set ip precedence new-precedence` commands.

For the `set dscp new-dscp` or the `set 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 precedence critical` command, which is the same as entering the `set precedence 5` command. For a list of supported mnemonics, enter the `set dscp ?` or the `set precedence ?` command to see the command-line help strings.
You can configure the `set cos new-cos`, `set dscp new-dscp`, `set precedence new-precedence`, or the `set mpls experimental exp-number` command in an ingress and an egress policy map attached to an enhanced-services (ES) port. You can configure only the `set dscp new-dscp` or the `set precedence new-precedence` command in an ingress nonhierarchical policy map attached to an standard SVI or an ES port.

If an ingress hierarchical policy map includes `set cos new-cos`, the `set dscp new-dscp`, or the `set precedence new-precedence` command, the switch automatically applies the port trust state to the ES port. The switch applies the port trust state to all inbound traffic on the ES port, including traffic that does not match the traffic class. For example, if you enter the `set cos new-cos` command, the switch automatically configures the interface to trust CoS.

In an ingress policy map, you cannot combine Layer 2 and Layer 3 `set` actions because the port can trust only one value in the inbound packet. For example, the switch does not support this policy map:

```
policy-map p1
  class cos1
    police cir per 10 conform-action set-cos-transmit 3
    set dscp af22
```

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 create a policy map called `p1` with CoS values assigned to different traffic types. Class maps for `voice` and `video-data` have already been created.

```
Switch(config)# policy-map p1
Switch(config-pmap)# class voice
Switch(config-pmap-c)# set cos 1
Switch(config-pmap)# exit
Switch(config-pmap)# class video-data
Switch(config-pmap-c)# set cos 2
Switch(config-pmap)# exit
```

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

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class</td>
<td>Specifies the name of the class whose traffic policy you want to create or change.</td>
</tr>
<tr>
<td>policy-map</td>
<td>Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.</td>
</tr>
<tr>
<td>show policy-map</td>
<td>Displays quality of service (QoS) policy maps.</td>
</tr>
<tr>
<td>trust</td>
<td>Defines a trust state for traffic class.</td>
</tr>
</tbody>
</table>
**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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, return to the setup program without saving, or return to the command-line prompt without saving the configuration.

**Examples**

This is an example of output from the `setup` command:

```
Switch# setup
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: yes

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

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

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

Enter host name [switch]: host-name

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

Enter enable secret [<Use current 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? [yes]: yes

Community string [public]:

Current interface summary

<table>
<thead>
<tr>
<th>Interface</th>
<th>IP-Address</th>
<th>OK? Method Status</th>
<th>Prol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vlan1</td>
<td>10.1.2.3</td>
<td>YES NVRAM up</td>
<td>up</td>
</tr>
<tr>
<td>Vlan100</td>
<td>unassigned</td>
<td>YES NVRAM down</td>
<td>down</td>
</tr>
<tr>
<td>Vlan150</td>
<td>unassigned</td>
<td>YES NVRAM down</td>
<td>down</td>
</tr>
<tr>
<td>Vlan901</td>
<td>unassigned</td>
<td>YES NVRAM down</td>
<td>down</td>
</tr>
<tr>
<td>FastEthernet1/0/1</td>
<td>unassigned</td>
<td>YES unset up</td>
<td>up</td>
</tr>
<tr>
<td>FastEthernet1/0/2</td>
<td>111.1.1.1</td>
<td>YES NVRAM up</td>
<td>up</td>
</tr>
</tbody>
</table>

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

Class A network is 10.0.0.0, 8 subnet bits; mask is /8

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 $1$ZzDa$X8ic4TpKggQ5wOgQ/xqdz1
enable password enable-password
line vty 0 15
password terminal-password
snmp-server community public
!
no ip routing
!
interface Vlan1
no shutdown
ip address 10.1.2.3 255.0.0.0
!
interface Vlan100
shutdown
no ip address
!
interface Vlan150
```
setup

shutdown
no ip address
!
interface Vlan901
shutdown
no ip address
!
interface FastEthernet1/0/1
!
interface FastEthernet1/0/2
shutdown
no ip address
!

<output truncated>

cluster enable cluster-name
!
end

[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]:

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>show version</td>
<td>Displays version information for the hardware and firmware.</td>
</tr>
</tbody>
</table>
**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 with the CLI-based setup program.

When you press the Mode button for 2 seconds on a configured switch, the LEDs next to 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.

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.
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 mode LEDs 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 if Express Setup mode is not enabled on the switch.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show setup express</code></td>
<td>Displays if Express Setup mode is active.</td>
</tr>
</tbody>
</table>
shape

Use the `shape` policy-map class configuration command to enable traffic shaping in a hierarchical policy map attached to an enhanced-services (ES) port. Traffic shaping limits the data transmission rate. Use the `no` form of this command to return to the default setting.

`shape average cir-bps`

`no shape average`

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>average</code></td>
<td>Enables average-rate traffic shaping.</td>
</tr>
<tr>
<td><code>cir-bps</code></td>
<td>Committed information rate, the bit rate that traffic is shaped to, in bps.</td>
</tr>
<tr>
<td></td>
<td>This is the access bit rate that you contract with your service provider or</td>
</tr>
<tr>
<td></td>
<td>the service levels that you intend to maintain. The range is 64000 to 2000000000 bps. Allocate the shaped rate in 100-kbps increments; otherwise, the software rounds down the rate to the nearest 100-kbps increment.</td>
</tr>
</tbody>
</table>

### Defaults

Average-rate traffic shaping is disabled.

### Command Modes

Policy-map class configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>Hierarchical service policies can be attached to inbound traffic received on an ES port.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

Use the `shape` command only in a hierarchical policy map attached to an ES port. This command is valid in policy maps at any level of the hierarchy.

Shaping is the process of delaying out-of-profile packets in queues so that they conform to a specified profile. Shaping is distinct from policing. Policing drops packets that exceed a configured threshold, but shaping buffers packets so that traffic remains within the threshold. Shaping offers greater smoothness in handling traffic than policing.

You must configure the `bandwidth` or the `shape` policy-map class configuration command before you configure either the `queue-limit` or the `random-detect` policy-map class configuration command in a class policy.

You cannot use the `bandwidth`, `queue-limit`, `random-detect`, and the `shape` policy-map class configuration commands with the `priority` policy-map class configuration command in the same class within the same policy map. However, you can use these commands in the same policy map.

To return to policy-map configuration mode, use the `exit` command. To return to privileged EXEC mode, use the `end` command.
The switch follows these rules when allocating bandwidth for VLAN-level and class-level classes:

- Shaping restricts the bandwidth available to VLAN-level classes. The shaping rate configured in the physical-level policy map becomes the total bandwidth available to all VLAN-level classes.
- For VLAN-level and class-level classes, the shaping rate becomes the available bandwidth if the bandwidth is not specified for that class.
- For VLAN-level and class-level classes, the shaping rate must be greater or equal to the bandwidth allocated at that level.
- The total bandwidth for VLAN-level classes, including the class-default, cannot exceed the available bandwidth of the port.
- The total bandwidth for class-level classes, including the class-default, cannot exceed the available bandwidth at the parent VLAN level.
- At the VLAN level and at the class level, the configured bandwidth is summed for all the children. If the summed bandwidth is less than the available bandwidth for the parent, the remaining bandwidth is distributed equally among the children.

**Examples**

This example shows how to limit the specified traffic class to a data transmission rate of 256 kbps:

```
Switch(config)# policy-map policy1
Switch(config-pmap)# class class1
Switch(config-pmap-c)# shape average 256000
Switch(config-pmap-c)# exit
Switch(config-pmap)# exit
Switch(config)# interface gigabitethernet1/1/1
Switch(config-if)# service-policy output policy1
```

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

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>bandwidth</code></td>
<td>Specifies or modifies the minimum bandwidth provided to a class belonging to a policy map attached to an ES port.</td>
</tr>
<tr>
<td><code>class</code></td>
<td>Specifies the name of the class whose traffic policy you want to create or change.</td>
</tr>
<tr>
<td><code>policy-map</code></td>
<td>Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.</td>
</tr>
<tr>
<td><code>priority</code></td>
<td>Enables the strict-priority queue and gives priority to a class of traffic belonging to a policy map attached to an ES port.</td>
</tr>
<tr>
<td><code>queue-limit</code></td>
<td>Configures the maximum threshold for tail drop in a policy map attached to an ES port.</td>
</tr>
<tr>
<td><code>random-detect</code></td>
<td>Configures Weighted Random Early Detection (WRED) in a policy map attached to an ES port.</td>
</tr>
<tr>
<td><code>service-policy</code> (policy-map class)</td>
<td>Creates a service policy as a quality of service (QoS) policy within a policy map.</td>
</tr>
<tr>
<td><code>show policy-map</code></td>
<td>Displays QoS policy maps.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.
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-NAT 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: 0
  Drop: All bytes count: 0
  Bridge Only: All frame count: 0
  Bridge Only: All bytes count: 0
  Forwarding To CPU: All frame count: 0
  Forwarding To CPU: All bytes count: 0

L3 ACL INPUT Statistics
  Drop: All frame count: 0
  Drop: All bytes count: 0
  Bridge Only: All frame count: 0
  Bridge Only: All bytes count: 0
  Forwarding To CPU: All frame count: 0
  Forwarding To CPU: All bytes count: 0
  Forwarded: All frame count: 0
  Forwarded: All bytes count: 0
  Drop And Log: All frame count: 0
  Drop And Log: All bytes count: 0
  Bridge Only And Log: All frame count: 0
  Bridge Only And Log: All bytes count: 0
  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
  Bridge Only: All frame count: 61
  Bridge Only: All bytes count: 3904
  Forwarding To CPU: All frame count: 0
  Forwarding To CPU: All bytes count: 0

<output truncated>
This is an example of output from the `show access-lists ipc` command:

Switch# `show access-lists ipc`
LC Access List Config Updates Rcvd
Standard Access Lists rcvd : 0
Simple Named Access Lists rcvd : 0
Extended Access Lists rcvd : 0
Extended Named Access Lists rcvd : 0
Rate-Limit Access Lists rcvd : 0
Delete one Access List rcvd : 0

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

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

**Syntax Description**

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

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

If you do not have a TFTP server, you can use the Cluster Management Suite (CMS) to download the image by using the HTTP protocol. 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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>archive download-sw</td>
<td>Downloads a new image from a TFTP server to the switch.</td>
</tr>
</tbody>
</table>
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 (ACLs).

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

This command is available only if your switch is running the enhanced multilayer image (EMI).

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>acl-name</td>
<td>(Optional) Name of the ACL.</td>
</tr>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>arp access-list</code></td>
<td>Defines an ARP ACL.</td>
</tr>
<tr>
<td><code>deny (ARP access-list config-uration)</code></td>
<td>Denies an ARP packet based on matches against the DHCP bindings.</td>
</tr>
<tr>
<td><code>ip arp inspection filter vlan</code></td>
<td>Permits ARP requests and responses from a host configured with a static IP address.</td>
</tr>
<tr>
<td><code>permit (ARP access-list config-uration)</code></td>
<td>Permits an ARP packet based on matches against the DHCP bindings.</td>
</tr>
</tbody>
</table>
**show auto qos**

Use the `show auto qos` user EXEC command to display the initial configuration that is generated by the automatic quality of service (auto-QoS) feature.

```
show auto qos [interface [interface-id]] [ | begin | exclude | include | expression]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface [interface-id]</code></td>
<td>(Optional) Display auto-QoS information for the specified port or for all ports.</td>
</tr>
<tr>
<td>`</td>
<td>begin`</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

In releases earlier than Cisco IOS Release 12.2(25)EY, the `show auto qos [interface [interface-id]]` command output shows the initial generated auto-QoS configuration.

In Cisco IOS Release 12.2(25)EY or later, 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.

On an enhanced-services (ES) port, the `srr-queue bandwidth shape` interface configuration command is not part of the generated `auto qos voip` command list.

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`

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 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
GigabitEthernet1/0/1
auto qos voip cisco-softphone
GigabitEthernet1/0/2
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 1/0/1
GigabitEthernet1/0/1
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 input dscp-map queue 2 threshold 3  5
mls qos srr-queue input dscp-map queue 3 threshold 3  6 7
mls qos srr-queue input dscp-map queue 3 threshold 3  3 4
mls qos srr-queue input dscp-map queue 4 threshold 2  1
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 3 threshold 3  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 320000 8000 exceed-action policed-dscp-transmit
!
!
interface GigabitEthernet1/0/1
  switchport mode access
  switchport port-security maximum 400
  service-policy input AutoQoS-Police-SoftPhone
  speed 100
duplex half
srr-queue bandwidth share 10 10 60 20
srr-queue bandwidth shape 10 0 0 0
auto qos voip cisco-softphone
!
interface GigabitEthernet1/0/2
  switchport mode access
  switchport port-security maximum 1999
  speed 100
duplex full
srr-queue bandwidth share 10 10 60 20
srr-queue bandwidth shape 10 0 0 0
mls qos trust device cisco-phone
mls qos trust cos
auto qos voip cisco-phone
!
<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-phone
```

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

```
Switch> show auto qos
AutoQoS not enabled on any interface
```

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

```
Switch> show auto qos interface gigabitethernet1/0/1
AutoQoS is disabled
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>auto qos voip</strong></td>
<td>Automatically configures QoS for VoIP within a QoS domain.</td>
</tr>
<tr>
<td><strong>debug auto qos</strong></td>
<td>Enables debugging of the auto-QoS feature.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

This is an example of output from the show boot command. Table 2-18 describes each field in the display.

```
Switch# show boot
BOOT path-list : flash:c3750-19-mz
Config file : flash:/config.text
Private Config file : flash:/private-config.text
Enable Break : no
Manual Boot : yes
HELPF path-list : 
```
Table 2-18  show boot Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOOT path-list</td>
<td>Displays a semicolon separated list of executable files to try to load and execute when automatically booting. 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 the first bootable file that it can find in the flash file system.</td>
</tr>
<tr>
<td>Config file</td>
<td>Displays the filename that the software uses to read and write a nonvolatile copy of the system configuration.</td>
</tr>
<tr>
<td>Private Config file</td>
<td>Displays the filename that the software uses to read and write a nonvolatile copy of the system configuration.</td>
</tr>
<tr>
<td>Enable Break</td>
<td>Displays whether a break during booting is enabled or disabled. If it is set to yes, on, or 1, you can interrupt the automatic boot process by pressing the Break key on the console after the flash file system is initialized.</td>
</tr>
<tr>
<td>Manual Boot</td>
<td>Displays whether the switch automatically or manually boots. If it is set to no or 0, the boot loader attempts to automatically boot the system. If it is set to anything else, you must manually boot the switch from the boot loader mode.</td>
</tr>
<tr>
<td>Helper path-list</td>
<td>Displays a semicolon separated list of loadable files to dynamically load during the boot loader initialization. Helper files extend or patch the functionality of the boot loader.</td>
</tr>
</tbody>
</table>

Note

Though visible in the display, the Auto upgrade field is not supported.

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>boot config-file</td>
<td>Specifies the filename that the software uses to read and write a nonvolatile copy of the system configuration.</td>
</tr>
<tr>
<td>boot enable-break</td>
<td>Enables interrupting the automatic boot process.</td>
</tr>
<tr>
<td>boot manual</td>
<td>Enables manually booting the switch during the next boot cycle.</td>
</tr>
<tr>
<td>boot private-config-file</td>
<td>Specifies the filename that software uses to read and write a nonvolatile copy of the private configuration.</td>
</tr>
<tr>
<td>boot system</td>
<td>Specifies the image to load during the next boot cycle.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class-map</td>
<td>Creates a class map to be used for matching packets to the class whose name you specify.</td>
</tr>
<tr>
<td>match (class-map configuration)</td>
<td>Defines the match criteria for a class map.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th><strong>Option</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
</tbody>
</table>

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

Command Modes

User EXEC

Command History

Release | Modification
------- | --------------
12.1(14)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, 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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cluster enable</td>
<td>Enables a command-capable switch as the cluster command switch, assigns a cluster name, and optionally assigns a member number to it.</td>
</tr>
<tr>
<td>show cluster candidates</td>
<td>Displays a list of candidate switches.</td>
</tr>
<tr>
<td>show cluster members</td>
<td>Displays information about the cluster members.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>detail</td>
<td>(Optional) Display detailed information for all candidates.</td>
</tr>
<tr>
<td>mac-address H.H.H.</td>
<td>(Optional) MAC address of the cluster candidate.</td>
</tr>
<tr>
<td></td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td></td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

### Command Modes

User EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

This command is available only on the 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
```

<table>
<thead>
<tr>
<th>MAC Address</th>
<th>Name</th>
<th>Device Type</th>
<th>PortIf</th>
<th>FEC</th>
<th>Hops</th>
<th>SN</th>
<th>PortIf</th>
<th>FEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>00d0.7961.c4c0</td>
<td>StLouis-2</td>
<td>WS-C3750 -12T</td>
<td>G1/0/1</td>
<td>2</td>
<td>1</td>
<td>Fa0/11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00d0.bbf5.e900</td>
<td>ldf-dist-128</td>
<td>WS-C3524-XL</td>
<td>Fa0/7</td>
<td>1</td>
<td>0</td>
<td>Fa0/24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00e0.1e7e.be80</td>
<td>1900_Switch</td>
<td>1900</td>
<td></td>
<td>3</td>
<td>0</td>
<td>Fa0/11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00e0.1e9f.7a00</td>
<td>Surfers-24</td>
<td>WS-C2924-XL</td>
<td>Fa0/5</td>
<td>1</td>
<td>0</td>
<td>Fa0/3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00e0.1e9f.8c00</td>
<td>Surfers-12-2</td>
<td>WS-C2912-XL</td>
<td>Fa0/4</td>
<td>1</td>
<td>0</td>
<td>Fa0/7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00e0.1e9f.8c40</td>
<td>Surfers-12-1</td>
<td>WS-C2912-XL</td>
<td>Fa0/1</td>
<td>1</td>
<td>0</td>
<td>Fa0/9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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:               Gi1/0/1   FEC number:
  Upstream port:            Gi1/0/11  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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show cluster</code></td>
<td>Displays the cluster status and a summary of the cluster to which the switch belongs.</td>
</tr>
<tr>
<td><code>show cluster members</code></td>
<td>Displays information about the cluster members.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>(Optional) Number that identifies a cluster member. The range is 0 to 15.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Display detailed information for all cluster members.</td>
</tr>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command is available only on the 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

<table>
<thead>
<tr>
<th>SN</th>
<th>MAC Address</th>
<th>Name</th>
<th>PortIf</th>
<th>FEC</th>
<th>Hops</th>
<th>SN</th>
<th>PortIf</th>
<th>FEC</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0002.4b29.2e00</td>
<td>StLouis1</td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>Up</td>
</tr>
<tr>
<td>1</td>
<td>0030.946c.d740</td>
<td>tal-switch-1</td>
<td>Fa0/13</td>
<td>1</td>
<td>0</td>
<td>G10/1</td>
<td>Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0002.b922.7180</td>
<td>nms-2820</td>
<td>Gi0/1</td>
<td>2</td>
<td>1</td>
<td>Fa0/18</td>
<td>Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0002.4b29.4400</td>
<td>SanJuan2</td>
<td>G10/1</td>
<td>2</td>
<td>1</td>
<td>Fa0/11</td>
<td>Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0002.4b28.c480</td>
<td>GenieTest</td>
<td>G10/2</td>
<td>2</td>
<td>1</td>
<td>Fa0/9</td>
<td>Up</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---Upstream---

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-C3750-12T
MAC address: 0002.4b29.4400
Upstream MAC address: 0030.946c.d740 (Cluster member 1)
Local port: G11/0/1 FEC number:
Upstream port: G11/0/11 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-C3750-12T
  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-C3750-12T
  MAC address: 0002.4b29.4400
  Upstream MAC address: 0030.946c.d740 (Cluster member 1)
  Local port: Gi1/0/1  FEC number: 
  Upstream port: Fa1/0/11  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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>show cluster</strong></td>
<td>Displays the cluster status and a summary of the cluster to which the switch belongs.</td>
</tr>
<tr>
<td><strong>show cluster candidates</strong></td>
<td>Displays a list of candidate switches.</td>
</tr>
</tbody>
</table>
**show controllers cpu-interface**

Use the `show controllers cpu-interface` privileged EXEC command to display the state of the CPU network interface application-specific integrated circuit (ASIC) and the send and receive statistics for packets reaching the CPU.

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

Privileged EXEC

**Command History**

**Release** | **Modification**
--- | ---
12.1(14)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 13EAE0D4
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              0000FFFF
MicTimeOutPeriod:            FrameTOPeriod: 00000EA6 DirectTOPeriod: 00004000
```

<output truncated>

### MicTransmitFifoInfo:

```
Fifo0:  StartPtrs:   038C2800  ReadPtr:    038C2C38
        WritePtrs:   038C2C38  Fifo_Flag:  8A800800
        Weights:    001E001E
Fifo1:  StartPtr:    03A9B6C0  ReadPtr:    03A9B6D0
        WritePtrs:   03A9B6C60  Fifo_Flag:  89800400
        WriteHeaderPtr: 03A9B660
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show controllers</td>
<td>Displays per-interface send and receive statistics read from the hardware or the interface internal registers.</td>
</tr>
<tr>
<td>ethernet-controller</td>
<td>Displays the administrative and operational status of all interfaces or a specified interface.</td>
</tr>
<tr>
<td>show interfaces</td>
<td></td>
</tr>
</tbody>
</table>
**show controllers ethernet-controller**

Use the `show controllers ethernet-controller` privileged EXEC command without keywords to display per-port send and receive statistics read from the hardware. Use with the `phy` keyword to display the port internal registers or the `port-asic` keyword to display information about the port application-specific integrated circuit (ASIC).

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

**Syntax Description**

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

**Command Modes**

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

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This display without keywords provides traffic statistics, basically the Remote Network Monitoring (RMON) statistics for all ports or for the specified port.

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 a port:

```
Switch# show controllers ethernet-controller gigabitethernet1/0/1

Transmit GigabitEthernet1/0/1               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  Minimum size frames
0  7 collision frames                         0  65 to 127 byte frames
0  8 collision frames                         0  128 to 255 byte frames
0  9 collision frames                         0  256 to 511 byte frames
0 10 collision frames                         0  512 to 1023 byte frames
0 11 collision frames                         0  1024 to 1518 byte frames
0 12 collision frames                         0  Overrun frames
0 13 collision frames                         0  Pause frames
0 14 collision frames                         0  Symbol error frames
0 15 collision 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  Too old frames
0  255 byte frames                            0  Valid oversize frames
0  511 byte frames                            0  System FCS error frames
0 1023 byte frames                            0  RxPortFifoFull drop frame
0 1518 byte frames                            0  Too large frames
0  Good (1 coll) frames
```

This is an example of output from the `show controllers ethernet-controller phy` command for a specific port. Note that the last line of the display shows the Auto-MDIX setting for the port.

```
Switch# show controllers ethernet-controller fastethernet1/0/3 phy

Control Register : 0011 0001 0000 0000
Control STATUS   : 0111 1000 0000 1001
Phy ID 1         : 0000 0000 0001 0011
Phy ID 2         : 0111 1000 1111 1011
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 Rx Regi    : 0000 0000 0000 0000
Port Configuration Register      : 0000 0001 1010 0100
Port Status Register             : 0000 0001 0000 0000
Interrupt Enable Register        : 1010 0000 0000 0000
Interrupt Status Register        : 0000 0000 0101 0100
LED Configuration Register       : 1001 1001 1001 0000
Trim Enable Register             : 0000 1101 0000 0000
Auto-MDIX                     : Off  [AdminState=0  Flags=0x00002248
```
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                : 00A0F01
GeneralIO                          : 000003F9 00000000 00000004
StackPcsInfo                       : FFFFFF00 860329BD 5555FFFF FFFFFFFF
                                : FF000000 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    : 00000000
NetworkActivity                    : 00000000 00000000 00000000 02400000
DroppedStatistics                  : 00000000
FrameLengthDeltaSelect             : 00000001
SneakPortFifoInfo                  : 00000000
MacInfo                            : 0EC0801C 00000001 0EC0801B 00000001
                                : 0EC0001D 00000001 0EC0001E 00000001
```

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
```

<output truncated>
show controllers ethernet-controller

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 TxQueue Bandwidth Drop Count 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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show boot</td>
<td>Displays the state of the CPU network ASIC and send and receive statistics for packets reaching the CPU.</td>
</tr>
<tr>
<td>show controllers tcam</td>
<td>Displays the state of registers for all ternary content addressable memory (TCAM) and TCAM ASICs.</td>
</tr>
</tbody>
</table>
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 port application-specific integrated circuits (ASICs) that are CAM controllers.

```
show controllers tcam [asic [number]] [detail] [(begin | exclude | include) expression]
```

**Syntax Description**

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

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 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
```
show controllers tcam

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 0012800 0012900

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show controllers cpu-interface</td>
<td>Displays the state of the CPU network ASIC and send and receive statistics for packets reaching the CPU.</td>
</tr>
<tr>
<td>show controllers ethernet-controller</td>
<td>Displays per-port send and receive statistics read from the hardware or the port internal registers.</td>
</tr>
</tbody>
</table>
show dot1q-tunnel

Use the **show dot1q-tunnel** user EXEC command to display information about 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 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 dot1q-tunnel** command:

```
Switch> show dot1q-tunnel
Port
-----
G1/1/1
G1/1/2
Po2
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>show vlan dot1q tag native</strong></td>
<td>Displays 802.1Q native VLAN tagging status.</td>
</tr>
<tr>
<td><strong>switchport mode dot1q-tunnel</strong></td>
<td>Configures an interface as an 802.1Q tunnel port.</td>
</tr>
</tbody>
</table>
show dot1x

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

```
show dot1x [all | interface interface-id | statistics interface interface-id] [ | begin | exclude | include] expression]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>(Optional) Display the 802.1x status for all ports.</td>
</tr>
<tr>
<td>interface</td>
<td>(Optional) Display the 802.1x status for the specified port (including type,</td>
</tr>
<tr>
<td>interface-id</td>
<td>module, and port number).</td>
</tr>
<tr>
<td>statistics</td>
<td>(Optional) Display 802.1x statistics for the switch or the specified port</td>
</tr>
<tr>
<td>statistics-interface</td>
<td>(Optional) Display 802.1x statistics for the switch or the specified port</td>
</tr>
<tr>
<td>expression</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

### Command Modes

Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

If you do not specify a port, global parameters and a summary are displayed. If you specify a port, details for that port are displayed.

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

This is an example of output from the `show dot1x` and the `show dot1x all` commands:

```
Switch# show dot1x
Sysauthcontrol = Enabled
Dot1x Protocol Version = 1
Dot1x Oper Controlled Directions = Both
Dot1x Admin Controlled Directions = Both

Switch# show dot1x all
Dot1x Info for interface FastEthernet1/0/3
----------------------------------------------------
Supplicant MAC 00d0.b71b.35de
AuthSM State      = CONNECTING
BendSM State      = IDLE
PortStatus        = UNAUTHORIZED
MaxReq            = 2
HostMode          = Single
Port Control      = Auto
QuietPeriod       = 60 Seconds
Re-authentication = Disabled
ReAuthPeriod      = 3600 Seconds
ServerTimeout     = 30 Seconds
SuppTimeout       = 30 Seconds
TxPeriod          = 30 Seconds
Guest-Vlan        = 0

Dot1x Info for interface FastEthernet1/0/7
----------------------------------------------------
PortStatus        = UNAUTHORIZED
MaxReq            = 2
HostMode          = Multi
Port Control      = Auto
QuietPeriod       = 60 Seconds
Re-authentication = Disabled
ReAuthPeriod      = 3600 Seconds
ServerTimeout     = 30 Seconds
SuppTimeout       = 30 Seconds
TxPeriod          = 30 Seconds
Guest-Vlan        = 0
```

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

```
Switch# show dot1x interface fastethernet1/0/3
Supplicant MAC 00d0.b71b.35de
  AuthSM State      = AUTHENTICATED
  BendSM State      = IDLE
  PortStatus        = AUTHORIZED
  MaxReq            = 2
  HostMode          = Single
  Port Control      = Auto
  QuietPeriod       = 60 Seconds
  Re-authentication = Disabled
  ReAuthPeriod      = 3600 Seconds
  ServerTimeout     = 30 Seconds
  SuppTimeout       = 30 Seconds
  TxPeriod          = 30 Seconds
  Guest-Vlan        = 0
```
This is an example of output from the `show dot1x statistics interface interface-id` command. Table 2-19 describes the fields in the display.

Switch# `show dot1x statistics interface fastethernet1/0/3`
PortStatistics Parameters for Dot1x

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TxReqId</td>
<td>Number of Extensible Authentication Protocol (EAP)-request/identity frames that have been sent.</td>
</tr>
<tr>
<td>TxReq</td>
<td>Number of EAP-request frames (other than request/identity frames) that have been sent.</td>
</tr>
<tr>
<td>TxTotal</td>
<td>Number of Extensible Authentication Protocol over LAN (EAPOL) frames of any type that have been sent.</td>
</tr>
<tr>
<td>RxStart</td>
<td>Number of valid EAPOL-start frames that have been received.</td>
</tr>
<tr>
<td>RxLogoff</td>
<td>Number of EAPOL-logoff frames that have been received.</td>
</tr>
<tr>
<td>RxRespId</td>
<td>Number of EAP-response/identity frames that have been received.</td>
</tr>
<tr>
<td>RxResp</td>
<td>Number of valid EAP-response frames (other than response/identity frames) that have been received.</td>
</tr>
<tr>
<td>RxInvalid</td>
<td>Number of EAPOL frames that have been received and have an unrecognized frame type.</td>
</tr>
<tr>
<td>RxLenError</td>
<td>Number of EAPOL frames that have been received in which the packet body length field is invalid.</td>
</tr>
<tr>
<td>RxTotal</td>
<td>Number of valid EAPOL frames of any type that have been received.</td>
</tr>
<tr>
<td>RxVersion</td>
<td>Number of received packets in the 802.1x version 1 format.</td>
</tr>
<tr>
<td>LastRxSrcMac</td>
<td>Source MAC address carried in the most recently received EAPOL frame.</td>
</tr>
</tbody>
</table>

Table 2-19  `show dot1x statistics Field Descriptions`

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dot1x default</code></td>
<td>Resets the configurable 802.1x parameters to their default values.</td>
</tr>
</tbody>
</table>
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** (Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, module, and port number).
- **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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 interface-id** command:

```
Switch# show dtp interface fastethernet1/0/1
DTP information for FastEthernet1/0/1:
    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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show interfaces</td>
<td>Displays interface trunking information.</td>
</tr>
</tbody>
</table>
show env

Use the `show env` user EXEC command to display fan, temperature, redundant power system (RPS) availability, and power information for the switch.

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Display both fan and temperature environmental status.</td>
</tr>
<tr>
<td>fan</td>
<td>Display the switch fan status.</td>
</tr>
<tr>
<td>power</td>
<td>Display the switch power status.</td>
</tr>
<tr>
<td>rps</td>
<td>Display whether an RPS 300 Redundant Power System is connected to the switch.</td>
</tr>
<tr>
<td>temperature</td>
<td>Display the switch temperature status.</td>
</tr>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the <code>expression</code>.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the <code>expression</code>.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified <code>expression</code>.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 env all` command:

```
Switch> show env all
FAN is OK
TEMPERATURE is OK
POWER is OK
RPS is NOT PRESENT
```

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

```
Switch> show env fan
FAN is OK
```
show errdisable detect

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

```
show errdisable detect [ | begin | exclude | include] expression
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>`</td>
<td>begin`</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

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

**Examples**

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

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

**Note**

Though visible, the `dhcp-rate-limit` and `unicast-flood` reasons are not supported.

**Note**

Though visible in the output, the `ilpower`, `storm-control`, and `unicast-flood` fields are not valid.
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>errdisable detect cause</code></td>
<td>Enables error-disabled detection for a specific cause or all causes.</td>
</tr>
<tr>
<td><code>show errdisable flap-values</code></td>
<td>Displays error condition recognition information.</td>
</tr>
<tr>
<td><code>show errdisable recovery</code></td>
<td>Displays error-disabled recovery timer information.</td>
</tr>
<tr>
<td><code>show interfaces status</code></td>
<td>Displays interface status or a list of interfaces in error-disabled state.</td>
</tr>
</tbody>
</table>
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
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>`</td>
<td>begin<code>(Optional) Display begins with the line that matches the</code>expression`.</td>
</tr>
<tr>
<td>`</td>
<td>exclude<code>(Optional) Display excludes lines that match the</code>expression`.</td>
</tr>
<tr>
<td>`</td>
<td>include<code>(Optional) Display includes lines that match the specified</code>expression`.</td>
</tr>
<tr>
<td><code>expression</code> Expression in the output to use as a reference point.</td>
<td></td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>ErrDisable Reason</th>
<th>Flaps</th>
<th>Time (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pagp-flap</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>dtp-flap</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>link-flap</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>errdisable detect cause</td>
<td>Enables error-disable detection for a specific cause or all causes.</td>
</tr>
<tr>
<td>show errdisable detect</td>
<td>Displays error-disable detection status.</td>
</tr>
<tr>
<td>show errdisable recovery</td>
<td>Displays error-disable recovery timer information.</td>
</tr>
<tr>
<td>show interfaces status</td>
<td>Displays interface status or a list of interfaces in error-disabled state.</td>
</tr>
</tbody>
</table>
show errdisable recovery

Use the `show errdisable recovery` user EXEC command to display the error-disable 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`.

**Command Modes**
User EXEC

**Command History**
```
Release   Modification
12.1(14)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.

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

**Examples**

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

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

Timer interval:300 seconds
```

**Note**
Though visible, the dhcp-rate-limit and unicast-flood reasons are not supported.
<table>
<thead>
<tr>
<th>Interface</th>
<th>Errdisable reason</th>
<th>Time left (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa1/0/4</td>
<td>link-flap</td>
<td>279</td>
</tr>
</tbody>
</table>

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

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>errdisable recovery</code></td>
<td>Configures the recover mechanism variables.</td>
</tr>
<tr>
<td><code>show errdisable detect</code></td>
<td>Displays error disable detection status.</td>
</tr>
<tr>
<td><code>show errdisable flap-values</code></td>
<td>Displays error condition recognition information.</td>
</tr>
<tr>
<td><code>show interfaces status</code></td>
<td>Displays interface status or a list of interfaces in error-disabled state.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>channel-group-number</td>
<td>(Optional) Number of the channel group. The range is 1 to 12.</td>
</tr>
<tr>
<td>detail</td>
<td>Display detailed EtherChannel information.</td>
</tr>
<tr>
<td>load-balance</td>
<td>Display the load-balance or frame-distribution scheme among interfaces in the port channel.</td>
</tr>
<tr>
<td>port</td>
<td>Display EtherChannel port information.</td>
</tr>
<tr>
<td>port-channel</td>
<td>Display port-channel information.</td>
</tr>
<tr>
<td>protocol</td>
<td>Display the protocol that is being used in the EtherChannel.</td>
</tr>
<tr>
<td>summary</td>
<td>Display a one-line summary per channel-group.</td>
</tr>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

In the output, the Passive port list field appears only for Layer 3 port channels. The appearance of 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 `include output`, the lines that contain output are not displayed, but the lines that contain Output are displayed.
Examples

This is an example of output from the `show etherchannel 1 detail` command:

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

       --------------
       Ports in the group:

       Port: 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 LACPDUs
       A - Device is in active mode. P - Device is in passive mode.

Local information:

       LACP port Admin Oper Port Port
       Flags State Priority Key Key Number State
Fa1/0/1 SA bndl 32768 0x1 0x1 0x101 0x3D
Fa1/0/2 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
```
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 `show etherchannel protocol` command:

```
Switch# show etherchannel protocol
    Channel-group listing:
    ----------------------
    Group: 1
    --------
    Protocol:  LACP
    Group: 2
    --------
    Protocol:  PAgP
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>channel-group</code></td>
<td>Assigns an Ethernet port to an EtherChannel group.</td>
</tr>
<tr>
<td><code>channel-protocol</code></td>
<td>Restricts the protocol used on an interface to manage channeling.</td>
</tr>
<tr>
<td><code>interface port-channel</code></td>
<td>Accesses or creates the port channel.</td>
</tr>
</tbody>
</table>
show ethernet service evc

Use the `show ethernet service evc` privileged EXEC command to display information about Ethernet virtual connection (EVC) customer-service instances.

```
show ethernet service evc [id evc-id | interface interface-id] [detail] [ | {begin | exclude | include} expression]
```

### Syntax Description

| **id evc-id** | (Optional) Display EVC information for the specified service. The EVC identifier can be a string of from 1 to 100 characters. |
| **interface interface-id** | (Optional) Display EVC information for the specified interface. |
| **detail interface-id** | (Optional) Display detailed information about EVC service or the specified EVC ID or 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

Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th><strong>Release</strong></th>
<th><strong>Modification</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.2(25)SEG</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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 ethernet service evc` command:

```
Switch# show ethernet service evc
Identifier    Type  Act-UNI-cnt Status
BLUE          P-P    2       Active
PINK          MP-MP  2       PartiallyActive
PURPLE        P-P    2       Active
BROWN         MP-MP  2       Active
GREEN         P-P    3       Active
YELLOW        MP-MP  2       PartiallyActive
BANANAS       P-P    0       InActive
TEST2         P-P    0       NotDefined
ORANGE        P-P    2       Active
TEAL          P-P    0       InActive
```

### Related Commands

<table>
<thead>
<tr>
<th><strong>Command</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ethernet evc evc-id</code></td>
<td>Defines an EVC and enters EVC configuration mode.</td>
</tr>
</tbody>
</table>
show ethernet service instance

Use the `show ethernet service instance` privileged EXEC command to display information about Ethernet customer-service instances.

```
show ethernet service instance [id id] [interface interface-id] [detail] [ | begin | exclude | include] expression
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>id id</code></td>
<td>(Optional) Display information for the specified service-instance identifier, a per-interface service identifier that does not map to a VLAN. The range is 1 to 4294967295.</td>
</tr>
<tr>
<td><code>interface interface-id</code></td>
<td>(Optional) Display service-instance information for the specified interface.</td>
</tr>
<tr>
<td><code>detail</code></td>
<td>(Optional) Display detailed information about service instances or the specified service-instance ID or interface.</td>
</tr>
<tr>
<td>`</td>
<td>begin`</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

### Command Modes

Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SEG</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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 ethernet service instance` command:

```
Switch# show ethernet service instance
Identifier  Interface      CE-Vlans
222          FastEthernet0/1  untagged,1-4094
10           FastEthernet0/2  200
222          FastEthernet0/2  200
333          FastEthernet0/2  default
10           FastEthernet0/3  300
11           FastEthernet0/3  300
10           FastEthernet0/4  300
10           FastEthernet0/6  untagged,1-4094
10           FastEthernet0/7  untagged,1-4094
10           FastEthernet0/8  untagged,1-4094
10           FastEthernet0/9  untagged
20           FastEthernet0/9  300
222          FastEthernet0/11  300-350,900-999
333          FastEthernet0/11  100-200,1000,1999-4094
222          FastEthernet0/12  20
```
### show ethernet service instance

<table>
<thead>
<tr>
<th>Service ID</th>
<th>Ethernet Port</th>
<th>Service Port</th>
<th>Service Port ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>333</td>
<td>FastEthernet0/12</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>FastEthernet0/13</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>FastEthernet0/13</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>FastEthernet0/13</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>FastEthernet0/13</td>
<td>222</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>FastEthernet0/14</td>
<td>200,222</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>FastEthernet0/14</td>
<td>333</td>
<td></td>
</tr>
<tr>
<td>555</td>
<td>FastEthernet0/14</td>
<td>555</td>
<td></td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>service instance id ethernet</code></td>
<td>Defines an Ethernet service instance and enters Ethernet service configuration mode.</td>
</tr>
</tbody>
</table>
show ethernet service interface

Use the `show ethernet service interface` privileged EXEC command to display interface-based information about Ethernet customer-service instances for all interfaces or a specified interface.

```
show ethernet service interface [interface-id] [detail] [ | begin | exclude | include ] expression
```

### Syntax Description
- **interface-id** (Optional) Display service-instance information for the specified interface.
- **detail** (Optional) Display detailed information about service instances on all interfaces or the specified 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
Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SEG</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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 outputs from the `show ethernet service interface` commands:

```
Switch# show ethernet service interface gigabitethernet0/1
Interface Identifier
GigabitEthernet0/1 PE2-G101

Switch# show ethernet service interface detail
Interface: FastEthernet0/1
ID:
CE-VLANS:
EVC Map Type: Bundling-Multiplexing
Interface: FastEthernet0/2
ID:
CE-VLANS:
EVC Map Type: Bundling-Multiplexing
Interface: FastEthernet0/3
ID:
CE-VLANS:
EVC Map Type: Bundling-Multiplexing

<output truncated>

Interface: GigabitEthernet0/1
ID: PE2-G101
```
show ethernet service interface

CE-VLANS: 10,20,30
EVC Map Type: Bundling-Multiplexing
Associated EVCs:
EVC-ID CE-VLAN
WHITE 30
RED 20
BLUE 10
Associated Service Instances:
Service-Instance-ID CE-VLAN
10 10
20 20
30 30

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>service instance id ethernet</code></td>
<td>Defines an Ethernet service instance and enters Ethernet service configuration mode from interface configuration mode.</td>
</tr>
</tbody>
</table>
show interfaces

show interfaces [interface-id] [vlan vlan-id] [accounting] [capabilities] [module number] [counters] [description] [etherchannel] [flowcontrol] [pruning] [stats] [status] [err-disabled] [switchport] [backup] [module number] [transceiver] [properties] [detail] [module number] [trunk] [ | begin | exclude | include | expression]

Syntax Description

- **interface-id** (Optional) Valid interfaces include physical ports (including type, module, and port number) and port channels. The port-channel range is 1 to 48.
- **vlan vlan-id** (Optional) VLAN identification. The range is 1 to 4094.
- **accounting** (Optional) Display accounting information on the interface, including active protocols and input and output packets and octets.
- **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 interface. This option is not available if you entered a specific interface ID.
- **counters** (Optional) See the `show interfaces counters` command.
- **description** (Optional) Display the administrative status and description set for an interface.
- **etherchannel** (Optional) Display interface EtherChannel information.
- **flowcontrol** (Optional) Display interface flowcontrol information.
- **pruning** (Optional) Display interface trunk VTP pruning information.
- **stats** (Optional) Display the input and output packets by switching path for the interface.
- **status** (Optional) Display the status of the interface. A status of `unsupported` in the Type field means that a non-Cisco small form-factor pluggable (SFP) module is inserted in the module slot.
- **err-disabled** (Optional) Display interfaces in error-disabled state.
- **switchport** (Optional) Display the administrative and operational status of a switching (nonrouting) port, including port blocking and port protection settings.
- **backup** (Optional) Display Flex Link backup interface configuration and status for the specified interface.
- **transceiver** [detail | properties] (Optional) Display the physical properties of a CWDM or DWDM 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.
show interfaces

<table>
<thead>
<tr>
<th>begin</th>
<th>(Optional) Display begins with the line that matches the expression.</th>
</tr>
</thead>
<tbody>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>The backup, transceiver detail, properties, and private-vlan mapping keywords were added.</td>
</tr>
<tr>
<td>12.2(25)SEE</td>
<td>Added the backup, counters, detail, and trunk keywords.</td>
</tr>
</tbody>
</table>

Usage Guidelines

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

- Entering show interface capabilities module 1 displays the capabilities of all interfaces on the switch. If you enter a number other than 1, the output is blank. This keyword is not available if you enter a specific interface ID before the capabilities keyword.
- Entering show interfaces interface-id capabilities displays the capabilities of the specified interface.
- Entering show interfaces capabilities (with no module number or interface ID) displays the capabilities of all interfaces on the switch.

The vlan mapping option is available only when you have entered any interface-ID or vlan vlan-id; however, the display shows VLAN mapping information only for ES ports.

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

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

```
Switch# show interfaces gigabitethernet0/2
GigabitEthernet0/2 is down, line protocol is down
    Hardware is Gigabit Ethernet, address is 0009.43a7.d085 (bia 0009.43a7.d085)
    MTU 1500 bytes, BW 10000 Rbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
    Encapsulation ARPA, loopback not set
    Keepalive set (10 sec)
    Auto-duplex, Auto-speed
    input flow-control is off, output flow-control is off
    ARP type: ARPA, ARP Timeout 04:00:00 Last input never, output never, output hang never
    Last clearing of "show interface" counters never
    Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
    Queueing strategy: fifo
    Output queue :0/40 (size/max)
    5 minute input rate 0 bits/sec, 0 packets/sec
    5 minute output rate 0 bits/sec, 0 packets/sec
    2 packets input, 1040 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog, 0 multicast, 0 pause input
    0 input packets with dribble condition detected
    4 packets output, 1040 bytes, 0 underruns
    0 output errors, 0 collisions, 3 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier, 0 PAUSE output
    0 output buffer failures, 0 output buffers swapped out
```

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

```
Switch# show interfaces accounting
Vlan1
  Protocol   Pkts In   Chars In   Pkts Out  Chars Out
  IP         1094395  131900022     559555   84077157
  Spanning Tree  283896   17033760         42       2520
  ARP          63738    3825680        231      13860
Interface Vlan2 is disabled
Vlan7
  Protocol   Pkts In   Chars In   Pkts Out  Chars Out
  No traffic sent or received on this interface.
Vlan31
  Protocol   Pkts In   Chars In   Pkts Out  Chars Out
  No traffic sent or received on this interface.
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,negotiate
  Channel:               yes
  Broadcast suppression: percentage(0-100)
  Flowcontrol:           rx-(off,on,deseired),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 interface-id pruning` command when pruning is enabled in the VTP domain:

```
Switch# show interfaces gigabitethernet1/0/2 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   18          auto   auto Not Present
Fa1/0/4                      notconnect   18          auto   auto 10/100BaseTX
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
```

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 2-20 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
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
Unknown unicast blocked: disabled
Unknown multicast blocked: disabled
Voice VLAN: none (Inactive)
Appliance trust: none
```
This is an example of 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 interface-id pruning` command:

```
Switch# show interfaces gigabitethernet1/0/2 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.

<table>
<thead>
<tr>
<th>Port</th>
<th>Temperature (Celsius)</th>
<th>High Alarm Threshold (Celsius)</th>
<th>High Warn Threshold (Celsius)</th>
<th>Low Warn Threshold (Celsius)</th>
<th>Low Alarm Threshold (Celsius)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/0/3</td>
<td>41.5</td>
<td>110.0</td>
<td>103.0</td>
<td>-8.0</td>
<td>-12.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>Voltage (Volts)</th>
<th>High Alarm Threshold (Volts)</th>
<th>High Warn Threshold (Volts)</th>
<th>Low Warn Threshold (Volts)</th>
<th>Low Alarm Threshold (Volts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/0/3</td>
<td>3.20</td>
<td>4.00</td>
<td>3.70</td>
<td>3.00</td>
<td>2.95</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>Current (milliamperes)</th>
<th>High Alarm Threshold (mA)</th>
<th>High Warn Threshold (mA)</th>
<th>Low Warn Threshold (mA)</th>
<th>Low Alarm Threshold (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/0/3</td>
<td>31.0</td>
<td>84.0</td>
<td>70.0</td>
<td>4.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>Optical Transmit Power (dBm)</th>
<th>High Alarm Threshold (dBm)</th>
<th>High Warn Threshold (dBm)</th>
<th>Low Warn Threshold (dBm)</th>
<th>Low Alarm Threshold (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/0/3</td>
<td>-0.0 (-0.0)</td>
<td>-0.0</td>
<td>-0.0</td>
<td>-0.0</td>
<td>-0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>Optical Receive Power</th>
<th>High Alarm Threshold</th>
<th>High Warn Threshold</th>
<th>Low Warn Threshold</th>
<th>Low Alarm Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>switchport access</code></td>
<td>Configures a port as a static-access or a dynamic-access port.</td>
</tr>
<tr>
<td><code>switchport block</code></td>
<td>Blocks unknown unicast or multicast traffic on an interface.</td>
</tr>
<tr>
<td><code>switchport backup interface</code></td>
<td>Configures Flex Links, a pair of Layer 2 interfaces that provide mutual backup.</td>
</tr>
<tr>
<td><code>switchport mode</code></td>
<td>Configures the VLAN membership mode of a port.</td>
</tr>
<tr>
<td><code>switchport protected</code></td>
<td>Isolates unicast, multicast, and broadcast traffic at Layer 2 from other protected ports on the same switch.</td>
</tr>
<tr>
<td><code>switchport trunk pruning</code></td>
<td>Configures the VLAN pruning-eligible list for ports in trunking mode.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>(dBm)</th>
<th>(dBm)</th>
<th>(dBm)</th>
<th>(dBm)</th>
<th>(dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/0/3</td>
<td>N/A</td>
<td>( -0.0)</td>
<td>--</td>
<td>-0.0</td>
<td>-0.0</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface-id</td>
<td>(Optional) ID of the physical interface, including type, module, and port number.</td>
</tr>
<tr>
<td>errors</td>
<td>(Optional) Display error counters.</td>
</tr>
<tr>
<td>etherchannel</td>
<td>(Optional) Display EtherChannel counters, including octets, broadcast packets, multicast packets, and unicast packets received and sent.</td>
</tr>
<tr>
<td>module switch-number</td>
<td>(Optional) Display counters for the specified module. The only valid value is 1.</td>
</tr>
<tr>
<td>protocol status</td>
<td>(Optional) Display status of protocols enabled on interfaces.</td>
</tr>
<tr>
<td>trunk</td>
<td>(Optional) Display trunk counters.</td>
</tr>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Note**

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

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>The <code>etherchannel</code> and <code>protocol status</code> keywords were added. The <code>broadcast</code>, <code>multicast</code>, and <code>unicast</code> keywords were removed.</td>
</tr>
</tbody>
</table>

**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.

```
Switch# show interfaces counters module 1
Port | InOctets | InUcastPkts | InMcastPkts | InBcastPkts
--- | --- | --- | --- | ---
Fa1/0/1 | 475256 | 105 | 4335 | 593
Fa1/0/2 | 0 | 0 | 0 | 0
Fa1/0/3 | 0 | 0 | 0 | 0
Fa1/0/4 | 0 | 0 | 0 | 0
Fa1/0/5 | 0 | 0 | 0 | 0
Fa1/0/6 | 0 | 0 | 0 | 0
Fa1/0/7 | 0 | 0 | 0 | 0
Fa1/0/8 | 0 | 0 | 0 | 0
Fa1/0/9 | 0 | 0 | 0 | 0
Fa1/0/10 | 0 | 0 | 0 | 0
Fa1/0/11 | 0 | 0 | 0 | 0
Fa1/0/12 | 0 | 0 | 0 | 0
Fa1/0/13 | 5689160 | 11548 | 63746 | 0
Fa1/0/14 | 1998856 | 11547 | 6092 | 0
Fa1/0/15 | 1999304 | 11548 | 6095 | 0
Fa1/0/16 | 1999752 | 11547 | 6099 | 0
Fa1/0/17 | 1999496 | 11547 | 6097 | 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
Fa1/0/1    0              0           0
Fa1/0/2    0              0           0
Fa1/0/3    80678           4155           0
Fa1/0/4    82320           126           0
Fa1/0/5    0              0           0
<output truncated>
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show interfaces</code></td>
<td>Displays additional interface characteristics.</td>
</tr>
</tbody>
</table>
show inventory

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

```
show inventory [entity-name | raw] [ | begin | exclude | include] expression
```

**Syntax Description**

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

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SEG</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The command is case sensitive. With no arguments, the show inventory command produces a compact display of all identifiable entities that have a product identifier. The compact display shows the entity location (slot identity), entity description, and the unique device identifier (UDI), including PID, Version Identifier (VID), and Serial Number (SN) of that entity.

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

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

**Examples**

This is example output from the show inventory command:

```
Switch> show inventory
NAME: "1",  DESCR:  "ME-C3750-24TE"
PID:       ,  VID:    ,  SN:  

NAME: "GigabitEthernet1/1/2",  DESCR:  "1000BaseSX SFP"
PID:       ,  VID:    ,  SN:  A50015093
```
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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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.
This is an example of output from the `show ip arp inspection interfaces` command:

```
Switch# show ip arp inspection interfaces

<table>
<thead>
<tr>
<th>Interface</th>
<th>Trust State</th>
<th>Rate (pps)</th>
<th>Burst Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/0/1</td>
<td>Untrusted</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Gi1/0/2</td>
<td>Untrusted</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Gi1/0/3</td>
<td>Untrusted</td>
<td>15</td>
<td>1</td>
</tr>
</tbody>
</table>
```

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

<table>
<thead>
<tr>
<th>Interface</th>
<th>Trust State</th>
<th>Rate (pps)</th>
<th>Burst Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/0/1</td>
<td>Untrusted</td>
<td>15</td>
<td>1</td>
</tr>
</tbody>
</table>
```

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.

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

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

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Forwarded</th>
<th>Dropped</th>
<th>DHCP Drops</th>
<th>ACL Drops</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3</td>
<td>4618</td>
<td>4605</td>
<td>4</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vlan</th>
<th>DHCP Permits</th>
<th>ACL Permits</th>
<th>Source MAC Failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Dest MAC Failures</th>
<th>IP Validation Failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
```
For the `show ip arp inspection statistics` command, the switch increments the number of forwarded packets for each ARP request and response packet on a trusted dynamic ARP inspection port. The switch increments the number of ACL- or DHCP-permitted packets for each packet that is denied by source MAC, destination MAC, or IP validation checks, and the switch increments the appropriate failure count.

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

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

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

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

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

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

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

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

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>arp access-list</code></td>
<td>Defines an ARP ACL.</td>
</tr>
<tr>
<td><code>clear ip arp inspection log</code></td>
<td>Clears the dynamic ARP inspection log buffer.</td>
</tr>
<tr>
<td><code>clear ip arp inspection statistics</code></td>
<td>Clears the dynamic ARP inspection statistics.</td>
</tr>
<tr>
<td><code>ip arp inspection log-buffer</code></td>
<td>Configures the dynamic ARP inspection logging buffer.</td>
</tr>
<tr>
<td><code>ip arp inspection vlan logging</code></td>
<td>Controls the type of packets that are logged per VLAN.</td>
</tr>
<tr>
<td><code>show arp access-list</code></td>
<td>Displays detailed information about ARP access lists.</td>
</tr>
</tbody>
</table>
show ip dhcp snooping

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

```
show ip dhcp snooping
```

**Syntax Description**

This command has no arguments or keywords.

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)SEE</td>
<td>The command output was updated to show the global suboption configuration.</td>
</tr>
</tbody>
</table>

**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
  Verification of hwaddr field is enabled
  Interface                      Trusted     Rate limit (pps)
  ------------------------------ -------     ----------------
  FastEthernet1/0/1               yes         unlimited
  FastEthernet1/0/2               yes         unlimited
  FastEthernet1/0/3                 no          2000
  FastEthernet1/0/4               yes         unlimited
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show ip dhcp snooping binding</code></td>
<td>Displays the DHCP snooping binding information.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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    GigabitEthernet1/0/1
00:D0:B7:1B:35:DE   10.1.2.151       237         dhcp-snooping  20    GigabitEthernet1/0/2
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
```

<table>
<thead>
<tr>
<th>MacAddress</th>
<th>IpAddress</th>
<th>Lease(sec)</th>
<th>Type</th>
<th>VLAN</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:02:03:04:05:06</td>
<td>10.1.2.150</td>
<td>9810</td>
<td>dhcp-snooping</td>
<td>20</td>
<td>GigabitEthernet1/0/1</td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>MacAddress</th>
<th>IpAddress</th>
<th>Lease(sec)</th>
<th>Type</th>
<th>VLAN</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:02:03:04:05:06</td>
<td>10.1.2.150</td>
<td>9788</td>
<td>dhcp-snooping</td>
<td>20</td>
<td>GigabitEthernet1/0/2</td>
</tr>
</tbody>
</table>

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 gigabitethernet1/0/2
```

<table>
<thead>
<tr>
<th>MacAddress</th>
<th>IpAddress</th>
<th>Lease(sec)</th>
<th>Type</th>
<th>VLAN</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:30:94:C2:EF:35</td>
<td>10.1.2.151</td>
<td>290</td>
<td>dhcp-snooping</td>
<td>20</td>
<td>GigabitEthernet1/0/2</td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>MacAddress</th>
<th>IpAddress</th>
<th>Lease(sec)</th>
<th>Type</th>
<th>VLAN</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:02:03:04:05:06</td>
<td>10.1.2.150</td>
<td>9747</td>
<td>dhcp-snooping</td>
<td>20</td>
<td>GigabitEthernet1/0/1</td>
</tr>
<tr>
<td>00:00:00:00:00:02</td>
<td>10.1.2.151</td>
<td>65</td>
<td>dhcp-snooping</td>
<td>20</td>
<td>GigabitEthernet1/0/2</td>
</tr>
</tbody>
</table>

Total number of bindings: 2

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacAddress</td>
<td>Client hardware MAC address</td>
</tr>
<tr>
<td>IpAddress</td>
<td>Client IP address assigned from the DHCP server</td>
</tr>
<tr>
<td>Lease(sec)</td>
<td>Remaining lease time for the IP address</td>
</tr>
<tr>
<td>Type</td>
<td>Binding type</td>
</tr>
<tr>
<td>VLAN</td>
<td>VLAN number of the client interface</td>
</tr>
<tr>
<td>Interface</td>
<td>Interface that connects to the DHCP client host</td>
</tr>
<tr>
<td>Total number of bindings</td>
<td>Total number of bindings configured on the switch</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip dhcp snooping binding</td>
<td>Configures the DHCP snooping binding database</td>
</tr>
<tr>
<td>show ip dhcp snooping</td>
<td>Displays the DHCP snooping configuration.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 Succeed 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 Succeed 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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip dhcp snooping</code></td>
<td>Enables DHCP snooping on a VLAN.</td>
</tr>
<tr>
<td><code>ip dhcp snooping database</code></td>
<td>Configures the DHCP snooping binding database agent or the binding file.</td>
</tr>
<tr>
<td><code>show ip dhcp snooping</code></td>
<td>Displays DHCP snooping information.</td>
</tr>
</tbody>
</table>
show ip igmp profile

Use the `show ip igmp profile` privileged EXEC command to view 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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` 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 229.9.9.0 229.9.9.0
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip igmp profile</td>
<td>Configures the specified IGMP profile number.</td>
</tr>
</tbody>
</table>
show ip igmp snooping

Use the `show ip igmp snooping` privileged 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.
- **| 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>The <code>groups</code> keyword was added. The <code>show ip igmp snooping groups</code> command replaced the <code>show ip igmp snooping multicast</code> command.</td>
</tr>
</tbody>
</table>

**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 for IGMP snooping.

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 igmp snooping` command. It shows how to display snooping characteristics for all VLANs on the switch.

```
Switch# show ip igmp snooping
vlan 1
-------
IGMP snooping is globally enabled
IGMP snooping TCN solicit query is globally disabled
IGMP snooping global TCN flood query count is 2
IGMP snooping is enabled on this Vlan
IGMP snooping immeicate-leave is disabled on this Vlan
IGMP snooping mrouter learn mode is plm-dvmrp on this Vlan
IGMP snooping source only learning age timer is 10
IGMP snooping is running in IGMP_ONLY mode on this Vlan
IGMP snooping report suppression is enabled on this Vlan
```
vlan 2

----------
IGMP snooping is globally enabled
IGMP snooping TCN solicit query is globally disabled
IGMP snooping global TCN flood query count is 2

<output truncated>

This is an example of output from the `show ip igmp snooping vlan 1` command. It shows how to display snooping characteristics for a specific VLAN.

Switch# show ip igmp snooping vlan 1
vlan 1
----------
IGMP snooping is globally enabled
IGMP snooping TCN solicit query is globally disabled
IGMP snooping global TCN flood query count is 2
IGMP snooping is enabled on this Vlan
IGMP snooping immediate-leave is disabled on this Vlan
IGMP snooping mrouter learn mode is pim-dvmrp on this Vlan
IGMP snooping source only learning age timer is 10
IGMP snooping is running in IGMP_ONLY mode on this Vlan
IGMP snooping report suppression is enabled on this Vlan

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip igmp snooping</td>
<td>Enables IGMP snooping on the switch or on a VLAN.</td>
</tr>
<tr>
<td>ip igmp snooping querier</td>
<td>Enables the IGMP querier function in Layer 2 networks.</td>
</tr>
<tr>
<td>ip igmp snooping report-suppression</td>
<td>Enables IGMP report suppression.</td>
</tr>
<tr>
<td>ip igmp snooping vlan immediate-leave</td>
<td>Enables IGMP snooping immediate-leave processing on a VLAN.</td>
</tr>
<tr>
<td>ip igmp snooping vlan mrouter</td>
<td>Adds a multicast router port or configures the multicast learning method.</td>
</tr>
<tr>
<td>ip igmp snooping vlan static</td>
<td>Statically adds a Layer 2 port as a member of a multicast group.</td>
</tr>
<tr>
<td>show ip igmp snooping groups</td>
<td>Displays the IGMP snooping multicast table for the switch.</td>
</tr>
<tr>
<td>show ip igmp snooping mrouter</td>
<td>Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN.</td>
</tr>
<tr>
<td>show ip igmp snooping querier</td>
<td>Displays the configuration and operation information for the IGMP querier configured on a switch.</td>
</tr>
</tbody>
</table>
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 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced. It replaced the <code>show ip igmp snooping multicast</code> command.</td>
</tr>
</tbody>
</table>

**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.
show ip igmp snooping groups

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

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

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

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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` are not displayed, but the lines that contain `Output` are displayed.

**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
-----   -----  
200    Fa1/0/13(static), Fa1/0/14(static)
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ip igmp snooping</strong></td>
<td>Enables IGMP snooping on the switch or on a VLAN.</td>
</tr>
<tr>
<td><strong>ip igmp snooping vlan mrouter</strong></td>
<td>Adds a multicast router port.</td>
</tr>
<tr>
<td><strong>ip igmp snooping vlan static</strong></td>
<td>Statically adds a Layer 2 port as a member of a multicast group.</td>
</tr>
<tr>
<td><strong>show ip igmp snooping</strong></td>
<td>Displays the IGMP snooping configuration of the switch or the VLAN.</td>
</tr>
<tr>
<td><strong>show ip igmp snooping groups</strong></td>
<td>Displays IGMP snooping multicast information for the switch or for the specified parameter.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>detail</code></td>
<td>Optional) Display detailed IGMP querier information.</td>
</tr>
<tr>
<td><code>vlan vlan-id [detail]</code></td>
<td>Optional) Display IGMP querier information for the specified VLAN. The range is 1 to 1001 and 1006 to 4094. Use the <code>detail</code> keyword to display detailed information.</td>
</tr>
<tr>
<td>`{begin</td>
<td>exclude</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 with 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.
show ip igmp snooping querier

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     Fa1/0/1
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 Fa1/0/1
----------------------------------
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip igmp snooping</td>
<td>Enables IGMP snooping on the switch or on a VLAN.</td>
</tr>
<tr>
<td>ip igmp snooping querier</td>
<td>Enables the IGMP querier function in Layer 2 networks.</td>
</tr>
<tr>
<td>show ip igmp snooping</td>
<td>Displays IGMP snooping multicast router ports for the switch or for the specified multicast VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

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

```
Switch> show ip source binding
MacAddr   IpAddr    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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ip dhcp snooping binding</strong></td>
<td>Configures the DHCP snooping binding database.</td>
</tr>
<tr>
<td><strong>ip source binding</strong></td>
<td>Configures static IP source bindings on the switch.</td>
</tr>
</tbody>
</table>
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**

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

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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
-------------------------------------------------------------------------------------------
Fa1/0/1          ip               active         10.0.0.1
Fa1/0/1          ip               active         deny-all
Fa1/0/2          ip               inactive-trust-port
Fa1/0/3          ip               inactive-no-snooping-vlan
Fa1/0/4          ip-mac           active         10.0.0.2    aaaa.bbbb.cccc  10
Fa1/0/4          ip-mac           active         11.0.0.1    aaaa.bbbb.cccd  11
Fa1/0/4          ip-mac           active         deny-all   deny-all       12-20
Fa1/0/5          ip-mac           active         10.0.0.3    permit-all    10
Fa1/0/5          ip-mac           active         deny-all   permit-all    11-20
```
In the previous example, this is the IP source guard configuration:

- On the Fast Ethernet 1/0/1 interface, DHCP snooping is enabled on VLANs 10 to 20. For VLAN 10, IP source guard with IP address filtering is configured on the interface, and a binding exists on the interface. For VLANs 11 to 20, the second entry shows that a default port access control list (ACL) is applied on the interface for the VLANs on which IP source guard is not configured.
- The Fast Ethernet 1/0/2 interface is configured as trusted for DHCP snooping.
- On the Fast Ethernet 1/0/3 interface, DHCP snooping is not enabled on the VLANs to which the interface belongs.
- On the Fast Ethernet 1/0/4 interface, IP source guard with source IP and MAC address filtering is enabled, and static IP source bindings are configured on VLANs 10 and 11. For VLANs 12 to 20, the default port ACL is applied on the interface for the VLANs on which IP source guard is not configured.
- On the Fast Ethernet 1/0/5 interface, IP source guard with source IP and MAC address filtering is enabled and configured with a static IP binding, but port security is disabled. The switch cannot filter source MAC addresses.

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

```
Switch> show ip verify source fastethernet1/0/6
IP source guard is not configured on the interface fa1/0/6.
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip verify source</td>
<td>Enables IP source guard on an interface.</td>
</tr>
</tbody>
</table>
**show l2protocol-tunnel**

Use the `show l2protocol-tunnel` user EXEC command to display information about Layer 2 protocol tunnel ports. The output displays information for the specified interface or all 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 12.
- `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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 l2protocol-tunnel` command:

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

Port | Protocol | Shutdown Threshold | Drop Threshold | Encapsulation Counter | Decapsulation Counter | Drop Counter |
----- | -------- | ------------------ |--------------- |----------------------- |---------------------- |------------|
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 | --- | --- | --- | --- | --- | --- |
```

```
pagp | --- | --- | 0 | 242500 |
lacp | --- | --- | 24268 | 242640 |
udld | --- | --- | 0 | 897960 |
```

```
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 | --- | --- | --- | --- | --- | --- |
```

```
pagp | 1000 | --- | 24249 | 242700 |
lacp | --- | --- | 24256 | 242660 |
udld | --- | --- | 0 | 897960 |
```
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

<table>
<thead>
<tr>
<th>Port</th>
<th>Protocol</th>
<th>Shutdown Threshold (cdp/stp/vtp)</th>
<th>Drop Threshold (cdp/stp/vtp)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(pagp/lacp/udld)</td>
<td>(pagp/lacp/udld)</td>
<td></td>
</tr>
<tr>
<td>Fa1/0/2</td>
<td>--- --- ---</td>
<td>----/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
<tr>
<td></td>
<td>pagp lacp udld</td>
<td>1000/----/----</td>
<td>----/----/----</td>
<td></td>
</tr>
<tr>
<td>Fa1/0/3</td>
<td>--- --- ---</td>
<td>----/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
<tr>
<td></td>
<td>pagp lacp udld</td>
<td>1000/----/----</td>
<td>----/----/----</td>
<td></td>
</tr>
<tr>
<td>Fa1/0/4</td>
<td>--- --- ---</td>
<td>----/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
<tr>
<td></td>
<td>pagp lacp udld</td>
<td>1000/500/----</td>
<td>----/----/----</td>
<td></td>
</tr>
<tr>
<td>Fa1/0/5</td>
<td>cdp stp vtp</td>
<td>----/----/----</td>
<td>----/----/----</td>
<td>down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000/----/----</td>
<td>----/----/----</td>
<td></td>
</tr>
<tr>
<td>Fa1/0/6</td>
<td>--- --- ---</td>
<td>----/----/----</td>
<td>----/----/----</td>
<td>down</td>
</tr>
<tr>
<td></td>
<td>pagp</td>
<td>1000/----/----</td>
<td>----/----/----</td>
<td></td>
</tr>
<tr>
<td>Fa1/0/7</td>
<td>--- --- ---</td>
<td>----/----/----</td>
<td>----/----/----</td>
<td>down</td>
</tr>
<tr>
<td></td>
<td>pagp</td>
<td>1000/----/----</td>
<td>----/----/----</td>
<td></td>
</tr>
</tbody>
</table>
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear l2protocol-tunnel counters</td>
<td>Clears counters for protocol tunneling ports.</td>
</tr>
<tr>
<td>l2protocol-tunnel</td>
<td>Enables Layer 2 protocol tunneling for Cisco Discovery Protocol (CDP), Spanning Tree Protocol (STP), or VLAN Trunking Protocol (VTP) packets on an interface.</td>
</tr>
<tr>
<td>l2protocol-tunnel cos</td>
<td>Configures a class of service (CoS) value for tunneled Layer 2 protocol packets.</td>
</tr>
</tbody>
</table>
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]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>channel-group-number</code></td>
<td>(Optional) Number of the channel group. The range is 1 to 12.</td>
</tr>
<tr>
<td><code>counters</code></td>
<td>Display traffic information.</td>
</tr>
<tr>
<td><code>internal</code></td>
<td>Display internal information.</td>
</tr>
<tr>
<td><code>neighbor</code></td>
<td>Display neighbor information.</td>
</tr>
<tr>
<td><code>sys-id</code></td>
<td>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.</td>
</tr>
<tr>
<td><code>begin</code></td>
<td>(Optional) Display begins with the line that matches the <code>expression</code>.</td>
</tr>
<tr>
<td><code>exclude</code></td>
<td>(Optional) Display excludes lines that match the <code>expression</code>.</td>
</tr>
<tr>
<td><code>include</code></td>
<td>(Optional) Display includes lines that match the specified <code>expression</code>.</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.
This is an example of output from the `show lacp counters` command user EXEC command. Table 2-22 describes the fields in the display.

```
Switch> show lacp counters
```

<table>
<thead>
<tr>
<th>Port</th>
<th>LACPUs</th>
<th>Marker</th>
<th>Marker Response</th>
<th>LACPUs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sent</td>
<td>Sent</td>
<td>Sent</td>
<td>Recv</td>
</tr>
<tr>
<td></td>
<td>Recv</td>
<td>Recv</td>
<td>Recv</td>
<td>Pkts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Err</td>
</tr>
</tbody>
</table>

Channel group: 1

<table>
<thead>
<tr>
<th>Port</th>
<th>LACPUs</th>
<th>Marker</th>
<th>Marker Response</th>
<th>LACPUs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sent</td>
<td>Sent</td>
<td>Sent</td>
<td>Recv</td>
</tr>
<tr>
<td></td>
<td>Recv</td>
<td>Recv</td>
<td>Recv</td>
<td>Pkts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Err</td>
</tr>
</tbody>
</table>

This is an example of output from the `show lacp internal` command:

```
Switch> show lacp 1 internal
```

Flags:  
S - Device is requesting Slow LACPUs  
F - Device is requesting Fast LACPUs  
A - Device is in Active mode  
P - Device is in Passive mode

<table>
<thead>
<tr>
<th>Port</th>
<th>Flags</th>
<th>State</th>
<th>Priority</th>
<th>Admin</th>
<th>Oper</th>
<th>Port</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa1/0/5</td>
<td>SA</td>
<td>bndl</td>
<td>32768</td>
<td>0x3</td>
<td>0x3</td>
<td>0x4</td>
<td>0x3D</td>
</tr>
<tr>
<td>Fa1/0/6</td>
<td>SA</td>
<td>bndl</td>
<td>32768</td>
<td>0x3</td>
<td>0x3</td>
<td>0x5</td>
<td>0x3D</td>
</tr>
<tr>
<td>Fa1/0/7</td>
<td>SA</td>
<td>bndl</td>
<td>32768</td>
<td>0x3</td>
<td>0x3</td>
<td>0x6</td>
<td>0x3D</td>
</tr>
</tbody>
</table>

### Table 2-22  `show lacp counters` Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LACPUs Sent and Recv</td>
<td>The number of LACP packets sent and received by an interface.</td>
</tr>
<tr>
<td>Marker Sent and Recv</td>
<td>The number of LACP marker packets sent and received by an interface.</td>
</tr>
<tr>
<td>Marker Response Sent and Recv</td>
<td>The number of LACP marker response packets sent and received by an interface.</td>
</tr>
<tr>
<td>LACPUs Pkts and Err</td>
<td>The number of unknown and illegal packets received by LACP for an interface.</td>
</tr>
</tbody>
</table>
Table 2-23 describes the fields in the display:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>State of the specific port. These are the allowed values:</td>
</tr>
<tr>
<td></td>
<td>• <code>—</code> Port is in an unknown state.</td>
</tr>
<tr>
<td></td>
<td>• <code>bndl</code> Port is attached to an aggregator and bundled with other ports.</td>
</tr>
<tr>
<td></td>
<td>• <code>susp</code> Port is in a suspended state; it is not attached to any aggregator.</td>
</tr>
<tr>
<td></td>
<td>• <code>hot-sby</code> Port is in a hot-standby state.</td>
</tr>
<tr>
<td></td>
<td>• <code>indiv</code> Port is incapable of bundling with any other port.</td>
</tr>
<tr>
<td></td>
<td>• <code>indep</code> 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).</td>
</tr>
<tr>
<td></td>
<td>• <code>down</code> Port is down.</td>
</tr>
<tr>
<td>LACP Port Priority</td>
<td>Port priority setting. LACP uses the port priority to put ports in standby mode when there is a hardware limitation that prevents all compatible ports from aggregating.</td>
</tr>
<tr>
<td>Admin Key</td>
<td>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. The ability of a port to aggregate with other ports is controlled by the port physical characteristics (for example, data rate and duplex capability) and configuration restrictions that you establish.</td>
</tr>
<tr>
<td>Oper Key</td>
<td>Runtime operational key that is being used by this port. LACP automatically generates this value as a hexadecimal number.</td>
</tr>
<tr>
<td>Port Number</td>
<td>Port number.</td>
</tr>
<tr>
<td>Port State</td>
<td>State variables for the port, encoded as individual bits within a single octet with these meanings:</td>
</tr>
<tr>
<td></td>
<td>• bit0: LACP_Activity</td>
</tr>
<tr>
<td></td>
<td>• bit1: LACP_Timeout</td>
</tr>
<tr>
<td></td>
<td>• bit2: Aggregation</td>
</tr>
<tr>
<td></td>
<td>• bit3: Synchronization</td>
</tr>
<tr>
<td></td>
<td>• bit4: Collecting</td>
</tr>
<tr>
<td></td>
<td>• bit5: Distributing</td>
</tr>
<tr>
<td></td>
<td>• bit6: Defaulted</td>
</tr>
<tr>
<td></td>
<td>• bit7: Expired</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Port</th>
<th>System ID</th>
<th>Port Number</th>
<th>Age</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa1/0/3</td>
<td>32768,0007.eb49.5e80</td>
<td>0xC</td>
<td>19s</td>
<td>SP</td>
</tr>
</tbody>
</table>

Partner’s information:

<table>
<thead>
<tr>
<th>Port</th>
<th>System ID</th>
<th>Port Number</th>
<th>Age</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa1/0/4</td>
<td>32768,0007.eb49.5e80</td>
<td>0xD</td>
<td>15s</td>
<td>SP</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear lacp</td>
<td>Clears LACP channel-group information.</td>
</tr>
<tr>
<td>lacp port-priority</td>
<td>Configures the LACP port priority.</td>
</tr>
<tr>
<td>lacp system-priority</td>
<td>Configures the LACP system priority.</td>
</tr>
</tbody>
</table>
**show link state group**

Use the **show link state group** global configuration command to display the link-state group information.

```
show link state group [number] [detail] [ | begin | exclude | include ] expression
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>(Optional) Number of the link-state group.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Specify that detailed information appears.</td>
</tr>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Defaults**

There is no default.

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SEE</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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
Link State Group: 1 Status: Enabled, Down
Upstream Interfaces : Fa1/0/15(Dwn) Fa1/0/16(Dwn)
Downstream Interfaces : Fa1/0/11(Dis) Fa1/0/12(Dis) Fa1/0/13(Dis) Fa1/0/14(Dis)
```

```
Link State Group: 2 Status: Enabled, Down
Upstream Interfaces : Fa1/0/15(Dwn) Fa1/0/16(Dwn) Fa1/0/17(Dwn)
Downstream Interfaces : Fa1/0/11(Dis) Fa1/0/12(Dis) Fa1/0/13(Dis) Fa1/0/14(Dis)
```

(Up):Interface up (Dwn):Interface Down (Dis):Interface disabled

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>link state group</td>
<td>Configures an interface as a member of a link-state group.</td>
</tr>
<tr>
<td>link state track</td>
<td>Enables a link-state group.</td>
</tr>
<tr>
<td>show running-config</td>
<td>Displays the current operating configuration. For syntax information, select Cisco IOS Configuration Fundamentals Command Reference for Release 12.2 &gt; Cisco IOS File Management Commands &gt; Configuration File Commands.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface interface-id</td>
<td>(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 64.</td>
</tr>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC; the interface keyword is available only in privileged EXEC mode.

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mac-access-group command. In this display, Fast Ethernet interface 1/0/12 has the MAC access list macl_e1 applied; no MAC ACLs are applied to other interfaces.

```
Switch> show mac access-group
Interface FastEthernet1/0/1:
  Inbound access-list is not set
Interface FastEthernet1/0/2:
  Inbound access-list is macl_e1
Interface FastEthernet1/0/3:
  Inbound access-list is not set
Interface FastEthernet1/0/4:
  Inbound access-list is not set

Interface FastEthernet1/0/10:
  Inbound access-list is not set
Interface FastEthernet1/0/11:
  Inbound access-list is not set
Interface FastEthernet1/0/12:
  Inbound access-list is macl_e1

<output truncated>
```
This is an example of output from the `show mac access-group interface interface-id` command:

```
Switch# show mac access-group interface gigabitethernet1/0/2
Interface GigabitEthernet1/0/2:
   Inbound access-list is macl_e1
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>mac access-group</code></td>
<td>Applies a MAC access group to an interface.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>`</td>
<td>`</td>
</tr>
<tr>
<td>`</td>
<td>begin`</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mac address-table` command:

```
Switch> show mac address-table
Mac Address Table
------------------------------------------
<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>0000.0000.0001</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0000.0000.0002</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0000.0000.0003</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0000.0000.0009</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0000.0000.0012</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0180.c200.000b</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0180.c200.000c</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0180.c200.000d</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0180.c200.000e</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0180.c200.000f</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>All</td>
<td>0180.c200.0010</td>
<td>STATIC</td>
<td>CPU</td>
</tr>
<tr>
<td>1</td>
<td>0030.9441.6327</td>
<td>DYNAMIC</td>
<td>Fa1/0/23</td>
</tr>
</tbody>
</table>
Total Mac Addresses for this criterion: 12
```
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>clear mac address-table dynamic</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>show mac address-table aging-time</strong></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><strong>show mac address-table count</strong></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><strong>show mac address-table dynamic</strong></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><strong>show mac address-table interface</strong></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td><strong>show mac address-table multicast</strong></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><strong>show mac address-table notification</strong></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td><strong>show mac address-table static</strong></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td><strong>show mac address-table vlan</strong></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 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
```
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mac address-table aging-time</code></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table count</code></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table dynamic</code></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table interface</code></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table multicast</code></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table notification</code></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table static</code></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table vlan</code></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vlan vlan-id</code></td>
<td>(Optional) Display aging time information for a specific VLAN. The range is 1 to 4094.</td>
</tr>
<tr>
<td>`</td>
<td>begin`</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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` are not displayed, but the lines that contain `Output` are displayed.

**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
```
<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>show mac address-table aging-time</code></td>
<td>Sets the length of time that a dynamic entry remains in the MAC address table after the entry is used or updated.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table address</code></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table count</code></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table dynamic</code></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table interface</code></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table multicast</code></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table notification</code></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table static</code></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td></td>
<td><code>show mac address-table vlan</code></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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` are not displayed, but the lines that contain `Output` are displayed.

**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 10:
------------------------
Dynamic Address Count   : 0
Static Address Count    : 0
Total Mac Addresses     : 0

Mac Entries for Vlan 1:
-----------------------
Dynamic Address Count   : 10
Static Address Count    : 0
Total Mac Addresses     : 10

Total Mac Address Space Available: 6120
```
<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>show mac address-table address</strong></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td></td>
<td><strong>show mac address-table aging-time</strong></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td></td>
<td><strong>show mac address-table dynamic</strong></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td></td>
<td><strong>show mac address-table interface</strong></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td></td>
<td><strong>show mac address-table multicast</strong></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td></td>
<td><strong>show mac address-table notification</strong></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td></td>
<td><strong>show mac address-table static</strong></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td></td>
<td><strong>show mac address-table vlan</strong></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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; `address` keyword available only in privileged EXEC mode.

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mac address-table dynamic` command:

```
Switch> show mac address-table dynamic
Mac Address Table
------------------------------------------
Vlan    Mac Address       Type        Ports
----    -----------       --------    -----
 1    0000.0c07.ac00    DYNAMIC     Fa1/0/1
 1    0000.0c07.ac81    DYNAMIC     Fa1/0/1
 1    0004.5a5e.f635    DYNAMIC     Fa1/0/1
 1    0006.d713.8dd0    DYNAMIC     Fa1/0/1
 1    0006.d78b.5d80    DYNAMIC     Fa1/0/1
 1    0008.217a.ea00    DYNAMIC     Fa1/0/1
 1    000a.b7d1.6f5b    DYNAMIC     Fa1/0/1
 1    0010.7b3a.e967    DYNAMIC     Fa1/0/1
 1    0010.a4e6.6e58    DYNAMIC     Fa1/0/1
 1    0090.92cf.1400    DYNAMIC     Fa1/0/1
Total Mac Addresses for this criterion: 10
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>clear mac address-table dynamic</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>show mac address-table address</strong></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td><strong>show mac address-table aging-time</strong></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><strong>show mac address-table count</strong></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><strong>show mac address-table interface</strong></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td><strong>show mac address-table multicast</strong></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><strong>show mac address-table static</strong></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td><strong>show mac address-table vlan</strong></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface-id</code></td>
<td>Specify an interface type; valid interfaces include physical ports and port channels.</td>
<td></td>
</tr>
<tr>
<td><code>vlan vlan-id</code></td>
<td>(Optional) Display entries for a specific VLAN; the range is 1 to 4094.</td>
<td></td>
</tr>
<tr>
<td>`</td>
<td>begin`</td>
<td>(Optional) Display begins with the line that matches the <code>expression</code>.</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
<td>(Optional) Display excludes lines that match the <code>expression</code>.</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
<td>(Optional) Display includes lines that match the specified <code>expression</code>.</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>User EXEC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command History</th>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

| 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. |

<p>| Examples              | This is an example of output from the <code>show mac address-table interface interface-id</code> command: |
|-----------------------|---|---|---|---|</p>
<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0030.b635.7862</td>
<td>DYNAMIC</td>
<td>Fa1/0/2</td>
</tr>
<tr>
<td>1</td>
<td>00b0.6496.2741</td>
<td>DYNAMIC</td>
<td>Fa1/0/2</td>
</tr>
<tr>
<td>Total Mac Addresses for this criterion: 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mac address-table address</code></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td><code>show mac address-table aging-time</code></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table count</code></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table dynamic</code></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table multicast</code></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table notification</code></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table static</code></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table vlan</code></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SEG</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mac address-table learning vlan</td>
<td>Enables or disables MAC address learning on a VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SED</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>clear mac address-table move update</code></td>
<td>Clears the MAC address-table move update counters.</td>
</tr>
<tr>
<td><code>mac address-table move update</code></td>
<td>Configures MAC address-table move update on the switch.</td>
</tr>
</tbody>
</table>
show mac address-table multicast

Use the show mac address-table multicast user EXEC command to display the Layer 2 multicast entries for all VLANs. Use the command in privileged EXEC mode to display specific multicast entries.

```
show mac address-table multicast [vlan-id] [count | user [count]] [ | begin | exclude | include] expression
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vlan vlan-id</td>
<td>(Optional) Display addresses for a specific VLAN. The range is 1 to 4094.</td>
</tr>
<tr>
<td>count</td>
<td>(Optional) Display the total number of entries for the specified command options instead of the actual entries.</td>
</tr>
<tr>
<td>user</td>
<td>(Optional) Display only the user-configured multicast entries.</td>
</tr>
<tr>
<td>**</td>
<td>begin (Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>**</td>
<td>exclude (Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>**</td>
<td>include (Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Note**

Though visible in the command-line help string, the igmp-snooping keyword is not supported. Use the show ip source binding privileged EXEC command to display the Internet Group Management Protocol (IGMP) snooping multicast table.

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mac address-table multicast command. It shows how to display all multicast entries for the switch.

```
Switch> show mac address-table multicast
Vlan  Mac Address   Type    Ports
----  -----------   ----    -----  
    0100.5e00.0128 IGMP    Gi1/0/1
```

This is an example of output from the show mac address-table multicast count command. It shows how to display a total count of MAC address entries for the switch.

```
Switch> show mac address-table multicast count
Multicast MAC Entries for all vlans: 10
```
This is an example of output from the `show mac address-table multicast vlan 1 count` command. It shows how to display a total count of MAC address entries for a VLAN.

```
Switch> show mac address-table multicast vlan 1 count
Multicast MAC Entries for vlan 1:  4
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mac address-table address</code></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td><code>show mac address-table aging-time</code></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table count</code></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table dynamic</code></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table interface</code></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table notification</code></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table static</code></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table vlan</code></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface</td>
<td>(Optional) Display information for all interfaces. Valid interfaces include physical ports and port channels.</td>
</tr>
<tr>
<td>interface-id</td>
<td>(Optional) Display information for the specified interface. Valid interfaces include physical ports and port channels.</td>
</tr>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 are displayed.

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

MAC Notification Traps are Enabled

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>clear mac address-table notification</code></td>
<td>Clears the MAC address notification global counters.</td>
</tr>
<tr>
<td><code>show mac address-table address</code></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td><code>show mac address-table aging-time</code></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table count</code></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table dynamic</code></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table interface</code></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table multicast</code></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table static</code></td>
<td>Displays static MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table vlan</code></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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]

```

<table>
<thead>
<tr>
<th>Syntax Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>address mac-address</code> (Optional) Specify a 48-bit MAC address; the valid format is H.H.H (available in privileged EXEC mode only).</td>
</tr>
<tr>
<td><code>interface interface-id</code> (Optional) Specify an interface to match; valid interfaces include physical ports and port channels.</td>
</tr>
<tr>
<td><code>vlan vlan-id</code> (Optional) Display addresses for a specific VLAN. The range is 1 to 4094.</td>
</tr>
<tr>
<td>`</td>
</tr>
<tr>
<td>`</td>
</tr>
<tr>
<td>`</td>
</tr>
<tr>
<td><code>expression</code> Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>User EXEC; <code>address</code> keyword available only in privileged EXEC mode.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command History</th>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T2.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressions are case sensitive. For example, if you enter `</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is an example of output from the <code>show mac address-table static</code> command:</td>
</tr>
</tbody>
</table>

```
Switch> show mac address-table static

Mac Address Table
--------------------------

Vlan  Mac Address    Type    Ports
-----  ---------    -------    ----
All    0100.0ccc.cccc STATIC CPU
All    0180.e200.0000 STATIC CPU
All    0100.0ccc.cced STATIC CPU
All    0180.e200.0001 STATIC CPU
All    0180.e200.0004 STATIC CPU
All    0180.e200.0005 STATIC CPU
4      0001.0002.0004 STATIC Drop
6      0001.0002.0007 STATIC Drop

Total Mac Addresses for this criterion: 8
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>mac address-table static</code></td>
<td>Adds static addresses to the MAC address table.</td>
</tr>
<tr>
<td><code>show mac address-table address</code></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td><code>show mac address-table aging-time</code></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table count</code></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table dynamic</code></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table interface</code></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table multicast</code></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table notification</code></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table vlan</code></td>
<td>Displays the MAC address table information for the specified VLAN.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vlan-id</td>
<td>(Optional) Display addresses for a specific VLAN. The range is 1 to 4094.</td>
</tr>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 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.c200.0004 | 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: 10
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mac address-table address</code></td>
<td>Displays MAC address table information for the specified MAC address.</td>
</tr>
<tr>
<td><code>show mac address-table aging-time</code></td>
<td>Displays the aging time in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table count</code></td>
<td>Displays the number of addresses present in all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table dynamic</code></td>
<td>Displays dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac address-table interface</code></td>
<td>Displays the MAC address table information for the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table multicast</code></td>
<td>Displays the Layer 2 multicast entries for all VLANs or the specified VLAN.</td>
</tr>
<tr>
<td><code>show mac address-table notification</code></td>
<td>Displays the MAC address notification settings for all interfaces or the specified interface.</td>
</tr>
<tr>
<td><code>show mac address-table static</code></td>
<td>Displays static MAC address table entries only.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mls qos command when QoS is enabled and Differentiated Services Code Point (DSCP) transparency is disabled:

```
Switch> show mls qos
QoS is enabled
QoS ip packet dscp rewrite disabled
```

This is an example of output from the show mls qos command when QoS is enabled and DSCP transparency is enabled:

```
Switch> show mls qos
QoS is enabled
QoS ip packet dscp rewrite enabled
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mls qos</td>
<td>Enables QoS for the entire switch.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mls qos aggregate-policer command:

```
Switch> show mls qos aggregate-policer policer1
aggregate-policer policer1 88000 2000000 exceed-action drop
Not used by any policy map
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mls qos aggregate-policer</td>
<td>Defines policer parameters that can be shared by multiple classes within the same policy map.</td>
</tr>
</tbody>
</table>
## 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

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>`</td>
<td>begin`</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

### Command Modes

User EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
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</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
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</tr>
</tbody>
</table>

### 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 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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>mls qos srr-queue input bandwidth</code></td>
<td>Assigns shaped round robin (SRR) weights to an ingress queue.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input buffers</code></td>
<td>Allocates the buffers between the ingress queues.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input cos-map</code></td>
<td>Maps class of service (CoS) values to an ingress queue or assigns CoS values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input dscp-map</code></td>
<td>Maps Differentiated Services Code Point (DSCP) values to an ingress queue or assigns DSCP values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input priority-queue</code></td>
<td>Configures the ingress priority queue and guarantees bandwidth.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input threshold</code></td>
<td>Assigns weighted tail-drop (WTD) threshold percentages to an ingress queue.</td>
</tr>
</tbody>
</table>
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 Point (DSCP) and class of service (CoS) values, the number of packets queued or dropped, and the number of in-profile and out-of-profile packets for each policer.
- `| begin`: (Optional) Display begins with the line that matches the `expression`.
- `| exclude`: (Optional) Display excludes lines that match the `expression`.
- `| include`: (Optional) Display includes lines that match the specified `expression`.
- `expression`: Expression in the output to use as a reference point.

**Note**

Though visible in the command-line help string, the `policers` keyword is not supported.

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mls qos interface interface-id` command:

```
Switch# show mls qos interface fastethernet1/0/7
FastEthernet1/0/7
Attached policy-map for Ingress: videowizard_policy
trust state: not trusted
COS override: dis
default COS: 0
DSCP Mutation Map: Default DSCP Mutation Map
```
This is an example of output from the `show mls qos interface interface-id buffers` command:

```
Switch> show mls qos interface fastethernet1/0/7 buffers
FastEthernet1/0/7
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:

```
Switch> show mls qos interface fastethernet1/0/7 queueing
GigabitEthernet1/0/7
Egress Priority Queue :enabled
Shaped queue weights (absolute) : 25 0 0 0
Shared queue weights : 25 25 25 25
The port bandwidth limit : 100  (Operational Bandwidth:100.0)
The port is mapped to qset : 1
```

This is an example of output from the `show mls qos interface interface-id statistics` command. 
Table 2-24 describes the fields in this display.

```
Switch> show mls qos interface fastethernet1/0/7 statistics
FastEthernet1/0/7

dscp: incoming
-------------------------------
   0 -  4 :    4213          0          0          0          0          0
   5 -  9 :         0          0          0          0          0          0
  10 - 14 :         0          0          0          0          0          0
  15 - 19 :         0          0          0          0          0          0
  20 - 24 :         0          0          0          0          0          0
  25 - 29 :         0          0          0          0          0          0
  30 - 34 :         0          0          0          0          0          0
  35 - 39 :         0          0          0          0          0          0
  40 - 44 :         0          0          0          0          0          0
  45 - 49 :         0          0          0          0          0          0
  50 - 54 :         0          0          0          0          0          0
  55 - 59 :         0          0          0          0          0          0
  60 - 64 :         0          0          0          0          0          0

dscp: outgoing
-------------------------------
   0 -  4 :    363949          0          0          0          0          0
   5 -  9 :         0          0          0          0          0          0
  10 - 14 :         0          0          0          0          0          0
  15 - 19 :         0          0          0          0          0          0
  20 - 24 :         0          0          0          0          0          0
  25 - 29 :         0          0          0          0          0          0
  30 - 34 :         0          0          0          0          0          0
  35 - 39 :         0          0          0          0          0          0
  40 - 44 :         0          0          0          0          0          0
  45 - 49 :         0          0          0          0          0          0
  50 - 54 :         0          0          0          0          0          0
  55 - 59 :         0          0          0          0          0          0
  60 - 64 :         0          0          0          0          0          0

cos: incoming
-------------------------------
   0 -  4 :    132067          0          0          0          0          0
   5 -  9 :         0          0          0          0          0          0
```
show mls qos interface

```
cos: outgoing
-------------------------------
  0 - 4 :  739155  0  0  0  0  0
  5 - 9 :    90  0  0
Policer: Inprofile:  0  OutofProfile:  0
```

**Note**
The `show mls qos interface interface-id statistics` command output might show more throughput than the actual amount on the interface.

### Table 2-24  show mls qos interface statistics Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSCP</td>
<td>Number of received packets for each DSCP value.</td>
</tr>
<tr>
<td></td>
<td>Number of sent packets for each DSCP value.</td>
</tr>
<tr>
<td>CoS</td>
<td>Number of received packets for each CoS value.</td>
</tr>
<tr>
<td></td>
<td>Number of sent packets for each CoS value.</td>
</tr>
<tr>
<td>Policer</td>
<td>Number of in profile packets for each policer.</td>
</tr>
<tr>
<td></td>
<td>Number of out of profile packets for each policer.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>mls qos queue-set output buffers</code></td>
<td>Allocates buffers to a queue-set.</td>
</tr>
<tr>
<td><code>mls qos queue-set output threshold</code></td>
<td>Configures the weighted tail-drop (WTD) thresholds, guarantees the availability of buffers, and configures the maximum memory allocation to a queue-set.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input bandwidth</code></td>
<td>Assigns shaped round robin (SRR) weights to an ingress queue.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input buffers</code></td>
<td>Allocates the buffers between the ingress queues.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input cos-map</code></td>
<td>Maps CoS values to an ingress queue or maps CoS values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input dscp-map</code></td>
<td>Maps DSCP values to an ingress queue or maps DSCP values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input priority-queue</code></td>
<td>Configures the ingress priority queue and guarantees bandwidth.</td>
</tr>
<tr>
<td><code>mls qos srr-queue input threshold</code></td>
<td>Assigns WTD threshold percentages to an ingress queue.</td>
</tr>
<tr>
<td><code>mls qos srr-queue output cos-map</code></td>
<td>Maps CoS values to an egress queue or maps CoS values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><code>mls qos srr-queue output dscp-map</code></td>
<td>Maps DSCP values to an egress queue or maps DSCP values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><code>policy-map</code></td>
<td>Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.</td>
</tr>
<tr>
<td><code>priority-queue</code></td>
<td>Enables the egress priority queue on a port.</td>
</tr>
<tr>
<td><code>queue-set</code></td>
<td>Maps a port to a queue-set.</td>
</tr>
<tr>
<td><code>srr-queue bandwidth limit</code></td>
<td>Limits the maximum output on a standard port.</td>
</tr>
</tbody>
</table>
### Command Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>srr-queue bandwidth shape</code></td>
<td>Assigns the shaped weights and enables bandwidth shaping on the four egress queues mapped to a standard port.</td>
</tr>
<tr>
<td><code>srr-queue bandwidth share</code></td>
<td>Assigns the shared weights and enables bandwidth sharing on the four egress queues mapped to a port.</td>
</tr>
</tbody>
</table>
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
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cos-dscp</td>
<td>(Optional) Display class of service (CoS)-to-DSCP map.</td>
</tr>
<tr>
<td>cos-input-q</td>
<td>(Optional) Display the CoS input queue threshold map.</td>
</tr>
<tr>
<td>cos-output-q</td>
<td>(Optional) Display the CoS output queue threshold map.</td>
</tr>
<tr>
<td>dscp-cos</td>
<td>(Optional) Display DSCP-to-CoS map.</td>
</tr>
<tr>
<td>dscp-input-q</td>
<td>(Optional) Display the DSCP input queue threshold map.</td>
</tr>
<tr>
<td>dscp-mutation dscp-mutation-name</td>
<td>(Optional) Display the specified DSCP-to-DSCP-mutation map.</td>
</tr>
<tr>
<td>dscp-output-q</td>
<td>(Optional) Display the DSCP output queue threshold map.</td>
</tr>
<tr>
<td>ip-prec-dscp</td>
<td>(Optional) Display the IP-precedence-to-DSCP map.</td>
</tr>
<tr>
<td>policed-dscp</td>
<td>(Optional) Display the policed-DSCP map.</td>
</tr>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

The policed-DSCP, DSCP-to-CoS, and the DSCP-to-DSCP-mutation maps are displayed 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 are displayed 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 :    04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 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 04-01 04-01 04-01 04-01 04-01 04-01
```
### show mls qos maps

**Dscp-inputq-threshold map:**

<table>
<thead>
<tr>
<th>d1 : d2</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 01-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>01-01 01-01 01-01 01-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cos-outputq-threshold map:**

- **cos:** 0 1 2 3 4 5 6 7
- **queue-threshold:** 2-1 2-1 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:**

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

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mls qos map</strong></td>
<td>Defines the CoS-to-DSCP map, the DSCP-to-CoS map, the DSCP-to-DSCP-mutation map, the IP-precedence-to-DSCP map, and the policed-DSCP map.</td>
</tr>
<tr>
<td><strong>mls qos srr-queue input cos-map</strong></td>
<td>Maps CoS values to an ingress queue or maps CoS values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><strong>mls qos srr-queue input dscp-map</strong></td>
<td>Maps DSCP values to an ingress queue or maps DSCP values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><strong>mls qos srr-queue output cos-map</strong></td>
<td>Maps CoS values to an egress queue or maps CoS values to a queue and to a threshold ID.</td>
</tr>
<tr>
<td><strong>mls qos srr-queue output dscp-map</strong></td>
<td>Maps DSCP values to an egress queue or maps DSCP values to a queue and to a threshold ID.</td>
</tr>
</tbody>
</table>
show mls qos queue-set

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

```
show mls qos queue-set [qset-id] [ | begin | exclude | include ] expression
```

**Syntax Description**

- `qset-id` (Optional) ID of the queue-set. Each port belongs to a queue-set, which defines all the characteristics of the four egress queues per port. The range is 1 to 2.
- `| begin` (Optional) Display begins with the line that matches the `expression`.
- `| exclude` (Optional) Display excludes lines that match the `expression`.
- `| include` (Optional) Display includes lines that match the specified `expression`.
- `expression` Expression in the output to use as a reference point.

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mls qos queue-set` command:

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>mls qos queue-set</code></td>
<td>Allocates buffers to the queue-set.</td>
</tr>
<tr>
<td><code>output buffers</code></td>
<td></td>
</tr>
<tr>
<td><code>mls qos queue-set</code></td>
<td>Configures the weighted tail-drop (WTD) thresholds, guarantees the availability of buffers, and configures the maximum memory allocation of the queue-set.</td>
</tr>
<tr>
<td><code>output threshold</code></td>
<td></td>
</tr>
</tbody>
</table>
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
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Command Modes</th>
<th>Command History</th>
<th>Usage Guidelines</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vlan-id</code></td>
<td>User EXEC</td>
<td>Release</td>
<td>Expressions are case sensitive. For example, if you enter `</td>
<td>exclude output`, the lines that contain output do not appear, but the lines that contain Output appear.</td>
</tr>
<tr>
<td>Display the policy maps for the specified VLAN. The range is 1 to 4094.</td>
<td></td>
<td>12.2(25)EY</td>
<td></td>
<td>Switch&gt; <code>show mls qos vlan 10</code></td>
</tr>
<tr>
<td><code>begin</code></td>
<td></td>
<td>This command was introduced.</td>
<td></td>
<td>Vlan10</td>
</tr>
<tr>
<td>(Optional) Display begins with the line that matches the <code>expression</code>.</td>
<td></td>
<td></td>
<td></td>
<td>Attached policy-map for Ingress:pm-test-pm-2</td>
</tr>
<tr>
<td><code>exclude</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Optional) Display excludes lines that match the <code>expression</code>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>include</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Optional) Display includes lines that match the specified <code>expression</code>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>expression</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expression in the output to use as a reference point.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>policy-map</code></td>
<td></td>
<td>Creates or modifies a policy map that can be attached to multiple ports and enters policy-map configuration mode.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

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

This is an example of output for the `show monitor` command:

```
Switch# show monitor
Session 1
--------
Type : Local Session
Source Ports :
RX Only : Fa1/0/1
Both : Fa1/0/2-3,Fa1/0/5-6
Destination Ports : Fa1/0/20
Encapsulation : Replicate
Ingress : Disabled

Session 2
--------
Type : Remote Source Session
Source VLANs :
TX Only : 10
Both : 1-9
Dest RSPAN VLAN : 105
```

This is an example of output for the `show monitor` command for RSPAN source session 1:

```
Switch# show monitor session 1
Session 1
--------
Type : Local Session
Source Ports :
RX Only : Fa1/0/1
Both : Fa1/0/2-3,Fa1/0/5-6
Destination Ports : Fa1/0/20
Encapsulation : Replicate
Ingress : Disabled
```

This is an example of output for the `show monitor session all` command when ingress traffic forwarding is enabled:

```
Switch# show monitor session all
Session 1
--------
Type : Local Session
Source Ports :
Both : Fa1/0/2
Destination Ports : Fa1/0/3
Encapsulation : Native
Ingress : Enabled, default VLAN = 5
Ingress encap : DOT1Q

Session 2
--------
Type : Local Session
Source Ports :
Both : Fa1/0/8
Destination Ports : Fa1/0/12
Encapsulation : Replicate
Ingress : Enabled, default VLAN = 4
Ingress encap : Untagged
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>monitor session</code></td>
<td>Starts or modifies a SPAN or RSPAN session.</td>
</tr>
</tbody>
</table>
show mpls l2transport vc

Use the show mpls l2transport vc user EXEC command to provide information about the Ethernet over multiprotocol label switching (EoMPLS) virtual circuits (VCs) that have been enabled to route Layer 2 packets on a provider-edge device.

```
show mpls l2transport vc [detail] [summary] [vc-id] [vc-id-min - vc-id-max] [ | begin | exclude | include] expression
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>detail</td>
<td>(Optional) Display provides detailed information about the VCs on a provider-edge device.</td>
</tr>
<tr>
<td>summary</td>
<td>(Optional) Display provides a summary of the configured VCs on the provider-edge device MPLS interfaces.</td>
</tr>
<tr>
<td>vcid</td>
<td>(Optional) Display information about the specified VC. The range is 1 to 4294967295.</td>
</tr>
<tr>
<td>vc-id-min - vc-id-max</td>
<td>(Optional) Display information about the specified range of VCs. The range is 1 to 4294967295.</td>
</tr>
<tr>
<td></td>
<td>begin</td>
</tr>
<tr>
<td></td>
<td>exclude</td>
</tr>
<tr>
<td></td>
<td>include</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 mpls l2transport vc` command:

```
Switch> show mpls l2transport vc
Transport Client     VC     Trans Local       Remote      Tunnel
VC ID     Intf     State  Type  VC Label    VC Label    Label
49        Vl60     UP     vlan  18          18          implc-null
50        Vl80     DOWN   vlan  unassigned  unassigned  not ready
52        Fa1/0/2  UP     ether 17          17          implc-null
```
show mpls l2transport vc

Table 2-25 describes the fields in the display.

Table 2-25    show mpls l2 transport vc Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport VC ID</td>
<td>The virtual circuit identifier assigned to one of the interfaces on the device.</td>
</tr>
<tr>
<td>Client Intf</td>
<td>The ingress or egress interface through which the Layer 2 VLAN packet travels. The interface is a VLAN or a physical interface.</td>
</tr>
<tr>
<td>VC State</td>
<td>The state of the VC (UP or DOWN):</td>
</tr>
<tr>
<td></td>
<td>UP—The VC can carry traffic between the two VC end points. A VC is up when both the local and remote interfaces are programmed.</td>
</tr>
<tr>
<td></td>
<td>• The local interface is programmed if the VC is configured and the client interface is up.</td>
</tr>
<tr>
<td></td>
<td>• The remote interface is programmed if the remote interface is configured and there is a VC remote VC label and an IGP label. The IGP label</td>
</tr>
<tr>
<td></td>
<td>means that there is a label-switched path (LSP) to the peer.</td>
</tr>
<tr>
<td></td>
<td>DOWN—The VC is not ready to carry traffic between the two VC end points.</td>
</tr>
<tr>
<td>Trans Type</td>
<td>The forwarding mode used.</td>
</tr>
<tr>
<td>Local VC Label</td>
<td>The VC label that a device signals to its peer device. The local VC label determines the egress interface of a packet arriving from the MPLS backbone.</td>
</tr>
<tr>
<td>Remote VC Label</td>
<td>The VC label of the remote peer device.</td>
</tr>
<tr>
<td>Tunnel Label</td>
<td>An IGP label used to route the packet over the MPLS backbone to the destination device that has the egress interface.</td>
</tr>
</tbody>
</table>

This is an example of the output from the **show mpls l2transport vc summary** command:

Switch> show mpls l2transport vc summary
MPLS interface VC summary (active vc(s) only):

VC summary (active/non-active) by destination:
   destination: 172.22.255.255, Number of locally configured vc(s): 2

This is an example of the output from the **show mpls l2transport vc detail** command:

Switch> show mpls l2transport vc detail
vcid: 49, type: vlan , local groupid: 32, remote groupid: 36 (vc is up)
  client: V160 is up, destination: 192.168.255.255, Peer LDP Ident: 192.168.255.25
  5:0
  local label: 18, remote label: 18, tunnel label: implc-null
  outgoing interface: Gi1/1/1, next hop: 10.2.0.2
Local MTU: 1500, Remote MTU: 1500
Remote interface description: Vlan60
  Packet totals(in/out): 0/0
  byte totals(in/out): 0/0

vcid: 50, type: vlan , local groupid: 33, remote groupid: -1 (vc is down)
  client: V180 is not up, destination: 192.168.255.255, Peer LDP Ident: 192.168.25
  5.255:0
  local label: unassigned, remote label: unassigned, tunnel label: not ready
Local MTU: 1500, Remote MTU: 0
Remote interface description:
Packet totals(in/out): 0/0
byte totals(in/out): 0/0

vcid: 52, type: ether, local groupid: 3, remote groupid: 3 (vc is up)
client: Fa1/0/2 is up, destination: 192.168.255.255, Peer LDP Ident: 192.168.255.255
local label: 17, remote label: 17, tunnel label: implc-null
outgoing interface: Gi1/1/1, next hop: 10.2.0.2
Local MTU: 1500, Remote MTU: 1500
Remote interface description: FastEthernet1/0/2
Packet totals(in/out): 606955/0
byte totals(in/out): 47342490/0

Table 2-26 describes the fields in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vcid</td>
<td>The virtual circuit identifier assigned to one of the interfaces on the device.</td>
</tr>
<tr>
<td>type</td>
<td>The forwarding mode used.</td>
</tr>
<tr>
<td>local groupid</td>
<td>The ID used to group VCs locally. EoMPLS groups VCs by the hardware port, which is unique for each port on a device.</td>
</tr>
<tr>
<td>remote groupid</td>
<td>The ID used by the peer to group several VCs.</td>
</tr>
<tr>
<td>vc is up or vc is down</td>
<td>The state of the VC (up or down):</td>
</tr>
<tr>
<td>client</td>
<td>The ingress or egress interface through which the Layer 2 VLAN packet travels. The interface is a VLAN or physical interface.</td>
</tr>
<tr>
<td>destination</td>
<td>The destination specified for this VC. You specify the destination IP address as part of the mpls l2transport route interface configuration command.</td>
</tr>
<tr>
<td>Peer LDP Ident</td>
<td>The LDP IP address of the targeted peer.</td>
</tr>
<tr>
<td>local label</td>
<td>The VC label that a device signals to its peer device. The local VC label determines the egress interface of a packet arriving from the MPLS backbone.</td>
</tr>
<tr>
<td>remote label</td>
<td>The VC label of the remote peer device.</td>
</tr>
<tr>
<td>tunnel label</td>
<td>An IGP label used to route the packet over the MPLS backbone to the destination device with the egress interface.</td>
</tr>
<tr>
<td>Outgoing interface</td>
<td>The egress interface of the VC.</td>
</tr>
</tbody>
</table>
Table 2-26  show mpls l2 transport vc detail Field Descriptions (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next hop</td>
<td>The IP address of the next hop.</td>
</tr>
<tr>
<td>Local MTU</td>
<td>The maximum transmission unit specified for the client interface.</td>
</tr>
<tr>
<td>Remote MTU</td>
<td>The maximum transmission unit specified for the remote device client interface.</td>
</tr>
<tr>
<td>Remote interface description</td>
<td>The interface on the remote device that has been enabled to send and receive Layer 2 packets.</td>
</tr>
<tr>
<td>Packet totals (in/out)</td>
<td>The total number of packets forwarded in each direction.</td>
</tr>
<tr>
<td>byte totals (in/out)</td>
<td>The total number of bytes forwarded in each direction.</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mpls l2transport route</td>
<td>Enables routing Layer 2 packets over a specified point-to-point VC by using EoMPLS.</td>
</tr>
</tbody>
</table>
**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

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
</table>
| | (Optional) Display begins with the line that matches the `expression`.
| | (Optional) Display excludes lines that match the `expression`.
| | (Optional) Display includes lines that match the specified `expression`.

### Command Modes

Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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 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 inter-operability 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).
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>mvr (global configuration)</code></td>
<td>Enables and configures multicast VLAN registration on the switch.</td>
</tr>
<tr>
<td><code>mvr (interface configuration)</code></td>
<td>Configures MVR ports.</td>
</tr>
<tr>
<td><code>show mvr interface</code></td>
<td>Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the <code>interface</code> and <code>members</code> keywords are appended to the command.</td>
</tr>
<tr>
<td><code>show mvr members</code></td>
<td>Displays all ports that are members of an MVR multicast group or, if there are no members, means the group is inactive.</td>
</tr>
</tbody>
</table>
show mvr interface

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

```
show mvr interface [interface-id [members [vlan vlan-id]]] [ | begin | exclude | include] expression
```

**Syntax Description**

- `interface-id` (Optional) Display MVR type, status, and Immediate Leave setting for the interface.
  Valid interfaces include physical ports (including type, module, and port number.

- `members` (Optional) Display all MVR groups to which the specified interface belongs.

- `vlan vlan-id` (Optional) Display all MVR group members on this VLAN. The VLAN ID 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(35)SE</td>
<td>The Mode and VLAN fields were added to the output display.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If you enter only the `show mvr interface` command, the output shows all MVR-enabled ports on the switch.

If you enter the `show mvr interface interface-id` command and the specified port is a non-MVR port, the output displays NON MVR in the Type field. For active MVR ports, it displays the port type (RECEIVER or SOURCE), mode (access or trunk), VLAN, status, and Immediate-Leave setting.

If you enter the `members` keyword, all MVR group members on the interface are displayed. If you enter a VLAN ID, all MVR group members in the VLAN are displayed.

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

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

```
Switch# show mvr interface
Port    Type            Mode            VLAN    Status          Immediate Leave
----    ----            ----            ----    -------         ---------------
Fa0/1   Receiver        Trunk          1      ACTIVE/UP      DISABLED
Fa0/1   Receiver        Trunk          2000   ACTIVE/DOWN    DISABLED
Fa0/2   Receiver        Trunk          2      ACTIVE/UP      DISABLED
Fa0/2   Receiver        Trunk          3000   ACTIVE/UP      DISABLED
Fa0/3   Receiver        Trunk          2      ACTIVE/UP      DISABLED
Fa0/3   Receiver        Trunk          3000   ACTIVE/UP      DISABLED
Fa0/10  Source          Access         10     ACTIVE/UP      DISABLED

In the preceding display, Status is defined as follows:

- Active means that 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 interface-id` command:

```
switch# show mvr interface fa0/10
Port    Type            Mode            VLAN    Status          Immediate Leave
----    ----            ----            ----    -------         ---------------
Fa0/10  RECEIVER        Trunk           201     ACTIVE/DOWN     DISABLED

This is an example of output from the `show mvr interface interface-id members` command:

```
Switch# show mvr interface fastethernet1/0/6 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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>mvr (global configuration)</code></td>
<td>Enables and configures multicast VLAN registration on the switch.</td>
</tr>
<tr>
<td><code>mvr (interface configuration)</code></td>
<td>Configures MVR ports.</td>
</tr>
<tr>
<td><code>show mvr</code></td>
<td>Displays the global MVR configuration on the switch.</td>
</tr>
<tr>
<td><code>show mvr members</code></td>
<td>Displays all receiver ports that are members of an MVR multicast group.</td>
</tr>
</tbody>
</table>
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 are displayed. 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)SEF</td>
<td>The VLAN and Membership fields were added to the output display.</td>
</tr>
</tbody>
</table>

**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` are not displayed, but the lines that contain `Output` are displayed.

**Examples**

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

```
Switch# show mvr members

+---------+----------+----------+-----+----------+
| MVR Group | Status   | Members  | VLAN | Membership |
|-----------+----------+----------+-----+-----------|
| 239.1.1.1 | ACTIVE   | Fa0/1    | 1   | Static    |
| 239.1.1.1 | ACTIVE   | Fa0/1    | 2000| Static    |
| 239.1.1.1 | ACTIVE   | Fa0/2    | 2   | Static    |
| 239.1.1.1 | ACTIVE   | Fa0/2    | 3000| Static    |
| 239.1.1.1 | ACTIVE   | Fa0/1    | 1   | Static    |
| 239.1.1.1 | ACTIVE   | Fa0/2    | 2   | Static    |

<output truncated>

239.255.0.255 INACTIVE None
239.255.1.0 INACTIVE None
```
This is an example of output from the `show mvr members ip-address` command. It shows how to view the members of the IP multicast group 239.255.0.2.

```
Switch# show mvr members 239.255.0.2
Switch# show mvr members 239.255.0.2
239.255.0.2     ACTIVE               Fa1/0/1(d), Fa1/0/2(d), Fa1/0/3(d)
                 Fa1/0/4(d), Fa1/0/5(s)
```

<table>
<thead>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mvr (global configuration)</td>
<td>Enables and configures multicast VLAN registration on the switch.</td>
</tr>
<tr>
<td>mvr (interface configuration)</td>
<td>Configures MVR ports.</td>
</tr>
<tr>
<td>show mvr</td>
<td>Displays the global MVR configuration on the switch.</td>
</tr>
<tr>
<td>show mvr interface</td>
<td>Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the <code>members</code> keyword is appended to the command.</td>
</tr>
</tbody>
</table>
show pagp

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

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

**Syntax Description**
- **channel-group-number** (Optional) Number of the channel group. The range is 1 to 12.
- **counters** Display traffic information.
- **internal** Display internal information.
- **neighbor** Display neighbor information.
- **| begin** (Optional) Display begins with the line that matches the `expression`.
- **| exclude** (Optional) Display excludes lines that match the `expression`.
- **| include** (Optional) Display includes lines that match the specified `expression`.
- **expression** Expression in the output to use as a reference point.

**Command Modes** User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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` are not displayed, but the lines that contain `Output` are displayed.

**Examples**

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

```
Switch> show pagp 1 counters

Port    Information      Flush   PAgP    Err    Pkts
Sent    Recv    Sent    Recv
------------------------------
Channel group: 1
Gi1/0/1  0    0       0    0   0
Gi1/0/1  0    0       0    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

<table>
<thead>
<tr>
<th>Port</th>
<th>Flags</th>
<th>State</th>
<th>Timers</th>
<th>Hello Interval</th>
<th>Count</th>
<th>Priority</th>
<th>Method</th>
<th>Ifindex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/0/1</td>
<td>SC</td>
<td>U6/S7</td>
<td>H</td>
<td>30s</td>
<td>1</td>
<td>128</td>
<td>Any</td>
<td>16</td>
</tr>
<tr>
<td>Gi1/0/2</td>
<td>SC</td>
<td>U6/S7</td>
<td>H</td>
<td>30s</td>
<td>1</td>
<td>128</td>
<td>Any</td>
<td>16</td>
</tr>
</tbody>
</table>
```

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

<table>
<thead>
<tr>
<th>Port</th>
<th>Partner</th>
<th>Partner ID</th>
<th>Age</th>
<th>Flags</th>
<th>Cap.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/0/1</td>
<td>switch-p2</td>
<td>0002.4b29.4600</td>
<td>9s</td>
<td>SC</td>
<td>10001</td>
</tr>
<tr>
<td>Gi1/0/2</td>
<td>switch-p2</td>
<td>0002.4b29.4600</td>
<td>24s</td>
<td>SC</td>
<td>10001</td>
</tr>
</tbody>
</table>
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear pagp</td>
<td>Clears PAgP channel-group information.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>brief</td>
<td>(Optional) Display the name of each macro.</td>
</tr>
<tr>
<td>description [interface interface-id]</td>
<td>(Optional) Display all macro descriptions or the description of a specific interface.</td>
</tr>
<tr>
<td>name macro-name</td>
<td>(Optional) Display information about a single macro identified by the macro name.</td>
</tr>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

### Command Modes

User EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.2(25)EY</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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  
# 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  
# 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 pagg

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)
--------------------------------------------------------------
Fa1/0/1        standard-switch10
Fa1/0/2       this is test macro
--------------------------------------------------------------

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

Switch# `show parser macro description interface fastethernet1/0/2`
Interface    Macro Description
--------------------------------------------------------------
Fa1/0/2      this is test macro
--------------------------------------------------------------

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>macro apply</code></td>
<td>Applies a macro on an interface or applies and traces a macro on an interface.</td>
</tr>
<tr>
<td><code>macro description</code></td>
<td>Adds a description about the macros that are applied to an interface.</td>
</tr>
<tr>
<td><code>macro global</code></td>
<td>Applies a macro on a switch or applies and traces a macro on a switch.</td>
</tr>
<tr>
<td><code>macro global description</code></td>
<td>Adds a description about the macros that are applied to the switch.</td>
</tr>
<tr>
<td><code>macro name</code></td>
<td>Creates a macro.</td>
</tr>
<tr>
<td><code>show running-config</code></td>
<td>Displays the current operating configuration, including defined macros. For syntax information, select <em>Cisco IOS Configuration Fundamentals Command Reference, Release 12.2 &gt; File Management Commands &gt; Configuration File Management Commands.</em></td>
</tr>
</tbody>
</table>
show policy-map

Use the `show policy-map` user EXEC command to display quality of service (QoS) policy maps, which define the traffic policy for a traffic class. 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-name] | interface interface-id [input | output] [class class-name]] [ | begin | exclude | include] expression
```

### Syntax Description

- **policy-map-name [class class-name]**: (Optional) Display the specified policy map and policy actions for the specified class.
- **interface interface-id [input | output] [class class-name]**: (Optional) For ingress ports, display the policy-map name that is applied to the specified port. For enhanced-services (ES) ports, display the policy-map configuration, Weighted Random Early Detection (WRED) statistics, and policer counters.

The keywords have these meanings:

- **input**: Display the ingress policy-map name applied to the specified port.
- **output**: Display the egress policy-map information applied to the specified ES port.
- **class class-name**: Display statistics for an 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`.

### Command Modes

User EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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 policy-map` command:

```
Switch> show policy-map

Policy Map p1
  class c1
  Bandwidth 20 (%)
  exponential weight 9

  dscp         min-threshold max-threshold mark-probability
  --------------------------
  af11          -          -            1/10
  af12          -          -            1/10
  af13          -          -            1/10
  af21          -          -            1/10
  af22          -          -            1/10
  af23          -          -            1/10
  af31          -          -            1/10
  af32          -          -            1/10
  af33          -          -            1/10
  af41          -          -            1/10
  af42          -          -            1/10
  af43          -          -            1/10
  cs1           -          -            1/10
  cs2           -          -            1/10
  cs3           -          -            1/10
  cs4           -          -            1/10
  cs5           -          -            1/10
  cs6           -          -            1/10
  cs7           -          -            1/10
  ef            -          -            1/10
  s  1000       6000         1/2000
  rsvp         -          -            1/10
  default      -          -            1/10

  Bandwidth 20 (%)
  exponential weight 9

  class    min-threshold max-threshold mark-probability
  --------------------------
  0        -          -            1/10
  1        -          -            1/10
  2        -          -            1/10
  3        -          -            1/10
  4        -          -            1/10
  5        1000       6000         1/2000
  6        -          -            1/10
  7        -          -            1/10
  rsvp     -          -            1/10
```
This is an example of output from the `show policy-map interface interface-id` command:

```
Switch> show policy-map interface gigabitethernet1/1/2
GigabitEthernet1/1/2

  service-policy output: vlan-policy

  class-map: vlan10-class (match-all)
  0 packets, 0 bytes
  5 minute offered rate 0 bps, drop rate 0 bps
  match: vlan 10

  Output Queue: Conversation 265
    Bandwidth 80 (%) (800000 kbps) Max Thresh 64 (packets)
  Statistics:
    WRED Packets Drop: 0
    WRED Bytes Drop: 0
    Tail Packets Drop: 0
    Tail Bytes Drop: 0
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>policy-map</strong></td>
<td>Creates or modifies a policy map that can be attached to multiple ports to specify a service policy.</td>
</tr>
</tbody>
</table>
show port-security

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

```
show port-security [interface interface-id] [address | vlan] [ | begin | exclude | include] expression
```

**Syntax Description**

- **interface interface-id** (Optional) Display port security settings for the specified interface. Valid interfaces include physical ports (including type, module, and port number).
- **address** (Optional) Display all secure MAC addresses on all ports or a specified port.
- **vlan** (Optional) Display port security settings for all VLANs on the specified interface. This keyword is visible only on interfaces that have the switchport mode set to trunk.
- **| begin** (Optional) Display begins with the line that matches the expression.
- **| exclude** (Optional) Display excludes lines that match the expression.
- **| include** (Optional) Display includes lines that match the specified expression.
- **expression** Expression in the output to use as a reference point.

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 show port-security address 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 show port-security interface interface-id address 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 show port-security address interface interface-id vlan 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 are not displayed, but the lines that contain Output are displayed.
This is an example of the output from the `show port-security` command:

```
Switch# show port-security
Secure Port  MaxSecureAddr (Count)  CurrentAddr (Count)  SecurityViolation (Count)  Security Action
-----------------------------------------------
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 interface-id 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
```
<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>switchport port-security</strong></td>
<td>Enables port security on a port, restricts the use of the port to a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>user-defined group of stations, and configures secure MAC addresses.</td>
</tr>
</tbody>
</table>
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 system resources for a particular feature, or use the command without a keyword to display the template in use.

```
show sdm prefer [default | routing | vlan] [ | begin | exclude | include] expression
```

**Note**
Though visible in the command-line help string, the `dual-ipv4-and-ipv6` keywords are not supported.

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>(Optional) Display the template that balances system resources among features.</td>
</tr>
<tr>
<td>routing</td>
<td>(Optional) Display the template that maximizes system resources for routing.</td>
</tr>
<tr>
<td>vlan</td>
<td>(Optional) Display the template that maximizes system resources for Layer 2 VLANs.</td>
</tr>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>The <code>routing-pbr</code> keywords were removed.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If you did not reload the switch after entering the `sdm prefer` global configuration command, the `show sdm prefer` privileged EXEC command displays the template in use and not the newly configured template.

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` are not displayed, but the lines that contain `Output` are displayed.
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 an example of output from the `show sdm prefer routing` command:

```
Switch# show sdm prefer routing
“desktop routing” template:
The selected template optimizes the resources in the switch to support this level of features for 8 routed interfaces and 1024 VLANs.

number of unicast mac addresses: 3K
number of 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
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>sdm prefer</code></td>
<td>Sets the SDM template to maximize resources for routing, policy-based routing, or VLANs, or to the default template.</td>
</tr>
</tbody>
</table>
**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]
```

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

**Defaults**

No default is defined.

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of output from the `show setup express` command:

```
Switch# show setup express
express setup mode is active
```
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 [active] [inconsistentports] [interface interface-id] [mst] [pathcost method] [root [summary] [total]] [uplinkfast] [vlan vlan-id] [1 {begin | exclude | include} expression]
```

```
show spanning-tree bridge-group [active [detail]] [blockedports] [bridge [active] [inconsistentports] [interface interface-id] [root [summary]] [1 {begin | exclude | include} expression]
```

```
show spanning-tree vlan vlan-id [active [detail]] [blockedports] [bridge [active] [inconsistentports] [interface interface-id] [root [summary]] [1 {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] [1 {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] | protocol] [1 {begin | exclude | include} expression]
```

```
show spanning-tree interface interface-id [active [detail]] [cost | detail [active] | inconsistency | portfast | priority | rootcost | state] [1 {begin | exclude | include} expression]
```

```
show spanning-tree mst [configuration [digest]] [instance-id [detail] [interface interface-id [detail]] [1 {begin | exclude | include} expression]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bridge-group</td>
<td>(Optional) Specify the bridge group number. The range is 1 to 255.</td>
</tr>
<tr>
<td>active [detail]</td>
<td>(Optional) Display spanning-tree information only on active interfaces</td>
</tr>
<tr>
<td></td>
<td>(available only in privileged EXEC mode).</td>
</tr>
<tr>
<td>backbonefast</td>
<td>(Optional) Display spanning-tree BackboneFast status.</td>
</tr>
<tr>
<td>blockedports</td>
<td>(Optional) Display blocked port information (available only in privileged</td>
</tr>
<tr>
<td></td>
<td>EXEC mode).</td>
</tr>
<tr>
<td>bridge [address</td>
<td>(Optional) Display status and configuration of this switch (optional</td>
</tr>
<tr>
<td>forward-time]</td>
<td>keywords available only in privileged EXEC mode).</td>
</tr>
<tr>
<td>hello-time]</td>
<td></td>
</tr>
<tr>
<td>id</td>
<td>max-age</td>
</tr>
<tr>
<td>detail [active]</td>
<td>(Optional) Display a detailed summary of interface information (active</td>
</tr>
<tr>
<td></td>
<td>keyword available only in privileged EXEC mode).</td>
</tr>
<tr>
<td>inconsistentports</td>
<td>(Optional) Display inconsistent port information (available only in</td>
</tr>
<tr>
<td></td>
<td>privileged EXEC mode).</td>
</tr>
<tr>
<td>interface [active [detail]</td>
<td>(Optional) Display spanning-tree information for the specified interface</td>
</tr>
<tr>
<td>interface-id</td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>(all options except portfast and state available only in privileged EXEC</td>
</tr>
<tr>
<td></td>
<td>mode). Enter each interface separated by a space. Ranges are not</td>
</tr>
<tr>
<td></td>
<td>supported. Valid interfaces include physical ports, VLANs, and port</td>
</tr>
<tr>
<td></td>
<td>channels. The VLAN range is 1 to 4094. The port-channel range is 1 to</td>
</tr>
<tr>
<td></td>
<td>12.</td>
</tr>
</tbody>
</table>
### show spanning-tree

The `show spanning-tree` command displays the current status of the multiple spanning-tree (MST) region configuration, including the MST region name, ID, and version information.

#### Syntax

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

- **mst** (Optional) Display the multiple spanning-tree (MST) region configuration and status (available only in privileged EXEC mode).
- **configuration** (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).
- **instance-id** (Optional) Display the current MST region instance ID. The range is 1 to 4094. The display shows the number of currently configured instances.
- **interface interface-id** (Optional) Valid interfaces include physical interfaces, VLANs, and NNI 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 interface states or the total lines of the spanning-tree state section.
- **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.
show spanning-tree

**Command Modes**

User EXEC; indicated keywords available only in privileged EXEC mode.

**Command History**

**Release** | **Modification**
---|---
12.1(14)AX | This command was introduced.
12.2(25)SEG | 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` are not displayed, but the lines that contain `Output` are displayed.

**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 (GigabitEthernet1/0/1)
  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
  ------------------- ---- --- -------- -------------------
  Gi1/0/1       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 24 (GigabitEthernet1/0/1), 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 2, max age 20, forward delay 15
  Timers: hello 0, topology change 0, notification 0, aging 300
  Uplinkfast enabled

Port 1 (GigabitEthernet1/0/1) 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 gigabitethernet1/0/1
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 gigabitethernet1/0/1
GigabitEthernet1/0/1 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
-------------------- ---- ----- --------- ---- --------------------------------
GigabitEthernet1/0/2 desg FWD 200000 128 P2P bound(STP)
Port-channel1       desg FWD 200000 128 P2P bound(STP)

Related Commands

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

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

```
show storm-control [interface-id] [broadcast | multicast | unicast] [ | begin | exclude | include] expression
```

### Syntax Description

- **interface-id**: (Optional) Interface ID for the physical port (including type, module, and port number).
- **broadcast**: (Optional) Display broadcast storm threshold setting.
- **multicast**: (Optional) Display multicast storm threshold setting.
- **unicast**: (Optional) Display unicast storm threshold setting.
- **begin**: (Optional) Display begins with the line that matches the `expression`.
- **exclude**: (Optional) Display excludes lines that match the `expression`.
- **include**: (Optional) Display includes lines that match the specified `expression`.
- **expression**: Expression in the output to use as a reference point.

### Command Modes

User EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

When you enter an `interface-id`, the storm control thresholds are displayed for the specified interface.

If you do not enter an `interface-id`, settings are displayed for one traffic type for all ports on the switch.

If you do not enter a traffic type, settings are displayed for broadcast storm control.

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 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
```

### Table 2-27: show storm-control Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Displays the ID of the interface.</td>
</tr>
<tr>
<td>Filter State</td>
<td>Displays the status of the filter:</td>
</tr>
<tr>
<td></td>
<td>- Blocking—Storm control is enabled, and a storm has occurred.</td>
</tr>
<tr>
<td></td>
<td>- Forwarding—Storm control is enabled, and no storms have occurred.</td>
</tr>
<tr>
<td></td>
<td>- Inactive—Storm control is disabled.</td>
</tr>
<tr>
<td>Upper</td>
<td>Displays the rising suppression level as a percentage of total available</td>
</tr>
<tr>
<td></td>
<td>bandwidth in packets per second or in bits per second.</td>
</tr>
<tr>
<td>Lower</td>
<td>Displays the falling suppression level as a percentage of total available</td>
</tr>
<tr>
<td></td>
<td>bandwidth in packets per second or in bits per second.</td>
</tr>
<tr>
<td>Current</td>
<td>Displays the bandwidth usage of broadcast traffic or the specified traffic</td>
</tr>
<tr>
<td></td>
<td>type (broadcast, multicast, or unicast) as a percentage of total available</td>
</tr>
<tr>
<td></td>
<td>bandwidth. This field is only valid when storm control is enabled.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>switchport</td>
<td>Sets the broadcast, multicast, or unicast storm</td>
</tr>
<tr>
<td></td>
<td>control levels for the switch.</td>
</tr>
</tbody>
</table>
# 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

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

## Command Modes

Privileged EXEC

## Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

## 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 10/100 ports; the system jumbo MTU refers to Gigabit ports.

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 system mtu** command:

```
Switch# show system mtu

System MTU size is 1500 bytes
System Jumbo MTU size is 1500 bytes
Routing MTU size is 1550 bytes.
```

## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>system mtu</code></td>
<td>Sets the MTU size for the Fast Ethernet or Gigabit Ethernet ports.</td>
</tr>
</tbody>
</table>
show udld

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

```
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
If you do not enter an `interface-id`, administrative and operational UDLD status for all interfaces are displayed.

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

**Examples**
This is an example of output from the `show 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 2-28 describes the fields in this display.

```
Switch> show udld fastethernet1/0/11
Interface fa1/0/11
---
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: Fa1/0/12
   Neighbor echo 1 device: Switch-B
   Neighbor echo 1 port: Fa1/0/11
   Message interval: 5
   CDP Device name: Switch-A
```
### show udld Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>The interface on the local device configured for UDLD.</td>
</tr>
<tr>
<td>Port enable administrative configuration setting</td>
<td>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.</td>
</tr>
<tr>
<td>Port enable operational state</td>
<td>Operational state that shows whether UDLD is actually running on this port.</td>
</tr>
<tr>
<td>Current bidirectional state</td>
<td>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.</td>
</tr>
<tr>
<td>Current operational state</td>
<td>The current phase of the UDLD state machine. For a normal bidirectional link, the state machine is most often in the Advertisement phase.</td>
</tr>
<tr>
<td>Message interval</td>
<td>How often advertisement messages are sent from the local device. Measured in seconds.</td>
</tr>
<tr>
<td>Time out interval</td>
<td>The time period, in seconds, that UDLD waits for echoes from a neighbor device during the detection window.</td>
</tr>
<tr>
<td>Entry 1</td>
<td>Information from the first cache entry, which contains a copy of echo information received from the neighbor.</td>
</tr>
<tr>
<td>Expiration time</td>
<td>The amount of time in seconds remaining before this cache entry is aged out.</td>
</tr>
<tr>
<td>Device ID</td>
<td>The neighbor device identification.</td>
</tr>
<tr>
<td>Current neighbor state</td>
<td>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 are displayed.</td>
</tr>
<tr>
<td>Device name</td>
<td>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).</td>
</tr>
<tr>
<td>Port ID</td>
<td>The neighbor port ID enabled for UDLD.</td>
</tr>
<tr>
<td>Neighbor echo 1 device</td>
<td>The device name of the neighbors’ neighbor from which the echo originated.</td>
</tr>
<tr>
<td>Neighbor echo 1 port</td>
<td>The port number ID of the neighbor from which the echo originated.</td>
</tr>
<tr>
<td>Message interval</td>
<td>The rate, in seconds, at which the neighbor is sending advertisement messages.</td>
</tr>
<tr>
<td>CDP device name</td>
<td>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).</td>
</tr>
</tbody>
</table>
This is an example of output from the `show udld interface-id` command when the aggressive mode is configured:

```console
Switch# show udld gigabitethernet1/0/1
Interface Gi1/0/1
---
Port enable administrative configuration setting:Enabled / in aggressive mode
Port enable operational state:Enabled / in aggressive mode
Current bidirectional state:Unknown
Current operational state:Link down
Message interval:7
Time out interval:5
No neighbor cache information stored
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>udld (global configuration)</code></td>
<td>Enables aggressive or normal mode in UDLD or sets the configurable message timer time.</td>
</tr>
<tr>
<td><code>udld (interface configuration)</code></td>
<td>Enables UDLD on an individual interface or prevents a fiber-optic port from being enabled by the <code>udld</code> global configuration command.</td>
</tr>
<tr>
<td><code>udld reset</code></td>
<td>Resets all interfaces shut down by UDLD and permits traffic to begin passing through them again.</td>
</tr>
</tbody>
</table>
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**

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

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 version command:

```
Switch> show version
Cisco Internetwork Operating System Software
IOS (tm) C3750ME Software (C3750ME-I5-M), Version 12.2(0.0.35)AX, CISCO DEVELOPMENT
Copyright (c) 1986-2003 by cisco Systems, Inc.
Compiled Mon 13-Oct-03 13:45 by yenanh
Image text-base: 0x00003000, data-base: 0x00A7C3F8

ROM: Bootstrap program is C3750 boot loader
BOO TLDR: C3750ME Boot Loader (C3750ME-HBOOT-M), Version 12.2 [jharrod-congo 100]

SwitchA uptime is 18 hours, 3 minutes
System returned to ROM by power-on
System image file is "flash:c3750me-i5-mz"

cisco 3750me-24-2-2 (PowerPC405) processor with 120822K/10240K bytes of memory.
Last reset from power-on
```

**Note**

Though visible in the show version output, the configuration register information is not supported on the switch.
Bridging software.
Target IOS Version 12.2(14)AX
1 Virtual Ethernet/IEEE 802.3 interface(s)
24 FastEthernet/IEEE 802.3 interface(s)
4 Gigabit Ethernet/IEEE 802.3 interface(s)
The password-recovery mechanism is enabled.
<output truncated>
1024K bytes of flash-simulated non-volatile configuration memory.
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 | mapping | name vlan-name | private-vlan [type] | remote-span | summary] [ | ] begin | exclude | include] expression
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>brief</strong></td>
<td>(Optional) Display one line for each VLAN with the VLAN name, status, and its ports.</td>
</tr>
<tr>
<td><strong>dot1q tag native</strong></td>
<td>(Optional) Display the 802.1Q native VLAN tagging status.</td>
</tr>
<tr>
<td><strong>id vlan-id</strong></td>
<td>(Optional) Display information about a single VLAN identified by VLAN ID number. For vlan-id, the range is 1 to 4094.</td>
</tr>
<tr>
<td><strong>internal usage</strong></td>
<td>(Optional) Display list of VLANs being used internally by the switch. These VLANs are always from the extended range (VLAN IDs 1006 to 4094). You cannot create VLANs with these IDs by using the <code>vlan</code> global configuration command until you remove them from internal use.</td>
</tr>
<tr>
<td><strong>mapping</strong></td>
<td>(Optional) Display VLAN mapping information (contents of the VLAN mapping table) for the enhanced-services (ES) ports. This command is supported only in privileged EXEC mode.</td>
</tr>
<tr>
<td><strong>name vlan-name</strong></td>
<td>(Optional) Display information about a single VLAN identified by VLAN name. The VLAN name is an ASCII string from 1 to 32 characters.</td>
</tr>
<tr>
<td><strong>private-vlan</strong></td>
<td>(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 EMI.</td>
</tr>
<tr>
<td><strong>type</strong></td>
<td>(Optional) Display only private VLAN ID and type.</td>
</tr>
<tr>
<td><strong>remote-span</strong></td>
<td>(Optional) Display information about Remote SPAN (RSPAN) VLANs.</td>
</tr>
<tr>
<td><strong>summary</strong></td>
<td>(Optional) Display VLAN summary information.</td>
</tr>
<tr>
<td><strong>begin</strong></td>
<td>(Optional) Display begins with the line that matches the <code>expression</code>.</td>
</tr>
<tr>
<td><strong>exclude</strong></td>
<td>(Optional) Display excludes lines that match the <code>expression</code>.</td>
</tr>
<tr>
<td><strong>include</strong></td>
<td>(Optional) Display includes lines that match the specified <code>expression</code>.</td>
</tr>
<tr>
<td><strong>expression</strong></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Note**

Though visible in the command-line help string, the `ifindex` and `private-vlan` keywords are not supported.

**Command Modes**

User EXEC, Privileged EXEC
**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.2(25)EY</td>
<td>The <code>private-vlan</code> keyword was added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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` are not displayed, but the lines that contain `Output` are displayed.

**Examples**

This is an example of output from the `show vlan` command. Table 2-29 describes each field in the display.

```
Switch> show vlan
VLAN Name     Status   Ports
---- -------------- -------------------------------
 1    default      active    Fa1/0/1, 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, Fa1/0/22
                              Fa1/0/23, Fa1/0/24, Gi1/0/1
                              Gi1/0/2, Gi1/1/1, Gi1/1/2
 30   VLAN0030      active    Fa1/0/2
 50   VLAN0050      active
 200  VLAN0200      active
 300  VLAN0300      active
 400  VLAN0400      active
1002 fddi-default act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default act/unsup
1005 trnet-default act/unsup

VLAN Type   SAID    MTU    Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
---- -------- --- ----- ------- -------- ---- ------- ---- ---- ---- ----
  1 enet    100001 1500   -     -     -     -      0      0     0     0
 30 enet    100030 1500   -     -     -     -      0      0     0     0
 50 enet    100050 1500   -     -     -     -      0      0     0     0
 200 enet   100200 1500   -     -     -     -      0      0     0     0
 300 enet   100300 1500   -     -     -     -      0      0     0     0
 400 enet   100400 1500   -     -     -     -      0      0     0     0
1002 fddi   101002 1500   -     -     -     -      0      0     0     0
1003 tr    101003 1500   -     -     -     -      0      0     0     0
1004 fdnet 101004 1500   -     -     -     -      ieee    0     0     0
1005 trnet 101005 1500   -     -     -     -      ibm     0     0     0
```
Remote SPAN VLANs

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Type</th>
<th>Ports</th>
</tr>
</thead>
</table>

Table 2-29  show vlan Command Output Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLAN</td>
<td>VLAN number.</td>
</tr>
<tr>
<td>Name</td>
<td>Name, if configured, of the VLAN.</td>
</tr>
<tr>
<td>Status</td>
<td>Status of the VLAN (active or suspend).</td>
</tr>
<tr>
<td>Ports</td>
<td>Ports that belong to the VLAN.</td>
</tr>
<tr>
<td>Type</td>
<td>Media type of the VLAN.</td>
</tr>
<tr>
<td>SAID</td>
<td>Security association ID value for the VLAN.</td>
</tr>
<tr>
<td>MTU</td>
<td>Maximum transmission unit size for the VLAN.</td>
</tr>
<tr>
<td>Parent</td>
<td>Parent VLAN, if one exists.</td>
</tr>
<tr>
<td>RingNo</td>
<td>Ring number for the VLAN, if applicable.</td>
</tr>
<tr>
<td>BrdgNo</td>
<td>Bridge number for the VLAN, if applicable.</td>
</tr>
<tr>
<td>Stp</td>
<td>Spanning Tree Protocol type used on the VLAN.</td>
</tr>
<tr>
<td>BrdgMode</td>
<td>Bridging mode for this VLAN—possible values are source-route bridging (SRB) and source-route transparent (SRT); the default is SRB.</td>
</tr>
<tr>
<td>Trans1</td>
<td>Translation bridge 1.</td>
</tr>
<tr>
<td>Trans2</td>
<td>Translation bridge 2.</td>
</tr>
<tr>
<td>Remote SPAN VLANs</td>
<td>Identifies any RSPAN VLANs that have been configured.</td>
</tr>
<tr>
<td>Primary/Secondary/</td>
<td>Not applicable to this release.</td>
</tr>
<tr>
<td>Type/Ports</td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>VLAN</th>
<th>Name</th>
<th>Status</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>VLAN0200</td>
<td>active</td>
<td>Fa1/0/17, Fa1/0/18, Fa1/0/21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G1/0/1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VLAN</th>
<th>Type</th>
<th>SAID</th>
<th>MTU</th>
<th>Parent</th>
<th>RingNo</th>
<th>BridgeNo</th>
<th>Stp</th>
<th>BrdgMode</th>
<th>Trans1</th>
<th>Trans2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>enet</td>
<td>100002</td>
<td>1500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Remote SPAN VLAN

Disabled
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 internal usage` command. It shows that VLANs 1025 and 1026 are being used as internal VLANs for Fast Ethernet routed ports 23 and 24. 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.

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, 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 mapping` command:

```
Switch# show vlan mapping

Interface Gi1/1/1:

<table>
<thead>
<tr>
<th>Outer VLAN</th>
<th>Inner VLAN</th>
<th>Translated VLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>20</td>
<td>120</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>drop</td>
</tr>
<tr>
<td>10</td>
<td>21</td>
<td>121</td>
</tr>
<tr>
<td>11</td>
<td>30</td>
<td>130</td>
</tr>
<tr>
<td>11</td>
<td>31</td>
<td>131</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>51</td>
<td></td>
<td>61</td>
</tr>
</tbody>
</table>
```

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. 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.

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, 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 internal usage` command. It shows that VLANs 1025 and 1026 are being used as internal VLANs for Fast Ethernet routed ports 23 and 24. 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.

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, 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 internal usage` command. It shows that VLANs 1025 and 1026 are being used as internal VLANs for Fast Ethernet routed ports 23 and 24. 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.

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, 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
```
show vlan

Interface Gi1/1/2:

<table>
<thead>
<tr>
<th>Outer VLAN</th>
<th>Inner VLAN</th>
<th>Translated VLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>-</td>
<td>drop</td>
</tr>
<tr>
<td>11</td>
<td>30</td>
<td>130</td>
</tr>
<tr>
<td>11</td>
<td>31</td>
<td>131</td>
</tr>
<tr>
<td>80</td>
<td>-</td>
<td>800</td>
</tr>
<tr>
<td>90</td>
<td>-</td>
<td>900</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>private-vlan</td>
<td>Configures a VLAN as a community, isolated, or primary VLAN or associates a primary VLAN with secondary VLANs.</td>
</tr>
<tr>
<td>switchport mode</td>
<td>Configures the VLAN membership mode of a port.</td>
</tr>
<tr>
<td>vlan (global configuration)</td>
<td>Enables config-vlan mode where you can configure VLANs 1 to 4094.</td>
</tr>
<tr>
<td>vlan (VLAN configuration)</td>
<td>Configures VLAN characteristics in the VLAN database. Only available for normal-range VLANs (VLAN IDs 1 to 1005). Do not enter leading zeros.</td>
</tr>
</tbody>
</table>
show vlan access-map

Use the `show vlan access-map` privileged EXEC command to display information about a particular VLAN access map or 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** 12.1(14)AX
- **Modification** 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 vlan access-map` command:

```
Switch# show vlan access-map
Vlan access-map 'SecWiz' 10
  Match clauses:
    ip  address: SecWiz_Fa1/0_3_in_ip
  Action:
    forward
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show vlan filter</code></td>
<td>Displays information about all VLAN filters or about a particular VLAN or VLAN access map.</td>
</tr>
<tr>
<td><code>vlan access-map</code></td>
<td>Creates a VLAN map entry for VLAN packet filtering.</td>
</tr>
<tr>
<td><code>vlan filter</code></td>
<td>Applies a VLAN map to one or more VLANs.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>access-map name</td>
<td>(Optional) Display filtering information for the specified VLAN access map.</td>
</tr>
<tr>
<td>vlan vlan-id</td>
<td>(Optional) Display filtering information for the specified VLAN. The range is 1 to 4094.</td>
</tr>
<tr>
<td>begin</td>
<td>(Optional) Display begins with the line that matches the expression.</td>
</tr>
<tr>
<td>exclude</td>
<td>(Optional) Display excludes lines that match the expression.</td>
</tr>
<tr>
<td>include</td>
<td>(Optional) Display includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 vlan filter command:

```
Switch# show vlan filter
VLAN Map map_1 is filtering VLANs:
  20-22
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show vlan access-map</td>
<td>Displays information about a particular VLAN access map or all VLAN access maps.</td>
</tr>
<tr>
<td>vlan access-map</td>
<td>Creates a VLAN map entry for VLAN packet filtering.</td>
</tr>
<tr>
<td>vlan filter</td>
<td>Applies a VLAN map to one or more VLANs.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>statistics</code></td>
<td>(Optional) Display VQP client-side statistics and counters.</td>
</tr>
<tr>
<td>`</td>
<td>begin`</td>
</tr>
<tr>
<td>`</td>
<td>exclude`</td>
</tr>
<tr>
<td>`</td>
<td>include`</td>
</tr>
<tr>
<td><code>expression</code></td>
<td>Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(14)AX</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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 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 2-30 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 2-30  show vmps statistics Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VQP Queries</td>
<td>Number of queries sent by the client to the VMPS.</td>
</tr>
<tr>
<td>VQP Responses</td>
<td>Number of responses sent to the client from the VMPS.</td>
</tr>
<tr>
<td>VMPS Changes</td>
<td>Number of times that the VMPS changed from one server to another.</td>
</tr>
<tr>
<td>VQP Shutdowns</td>
<td>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.</td>
</tr>
<tr>
<td>VQP Denied</td>
<td>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.</td>
</tr>
<tr>
<td>VQP Wrong Domain</td>
<td>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.</td>
</tr>
<tr>
<td>VQP Wrong Version</td>
<td>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.</td>
</tr>
<tr>
<td>VQP Insufficient Resource</td>
<td>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.</td>
</tr>
</tbody>
</table>
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>clear vmps statistics</code></td>
<td>Clears the statistics maintained by the VQP client.</td>
</tr>
<tr>
<td><code>vmps reconfirm</code></td>
<td>Sends VQP queries to reconfirm all dynamic VLAN assignments with the VMPS.</td>
</tr>
<tr>
<td><code>(privileged EXEC)</code></td>
<td></td>
</tr>
<tr>
<td><code>vmps retry</code></td>
<td>Configures the per-server retry count for the VQP client.</td>
</tr>
<tr>
<td><code>vmps server</code></td>
<td>Configures the primary VMPS and up to three secondary servers.</td>
</tr>
</tbody>
</table>
show vtp

Use the `show vtp` user EXEC command to display general information about the VLAN Trunking Protocol (VTP) management domain, status, and counters.

```plaintext
show vtp {counters | status} [ | begin | exclude | include] expression
```

**Syntax Description**

- `counters` Display the VTP statistics for the switch.
- `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 12.1(14)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 vtp counters` command. Table 2-31 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:

<table>
<thead>
<tr>
<th>Trunk</th>
<th>Join Transmitted</th>
<th>Join Received</th>
<th>Summary advts received from non-pruning-capable device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa1/0/17</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fa1/0/18</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
```
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary advertisements</td>
<td>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.</td>
</tr>
<tr>
<td>received</td>
<td></td>
</tr>
<tr>
<td>Subset advertisements</td>
<td>Number of subset advertisements received by this switch on its trunk ports. Subset advertisements contain all the information for one or more VLANs.</td>
</tr>
<tr>
<td>received</td>
<td></td>
</tr>
<tr>
<td>Request advertisements</td>
<td>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.</td>
</tr>
<tr>
<td>received</td>
<td></td>
</tr>
<tr>
<td>Summary advertisements</td>
<td>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.</td>
</tr>
<tr>
<td>transmitted</td>
<td></td>
</tr>
<tr>
<td>Subset advertisements</td>
<td>Number of subset advertisements sent by this switch on its trunk ports. Subset advertisements contain all the information for one or more VLANs.</td>
</tr>
<tr>
<td>transmitted</td>
<td></td>
</tr>
<tr>
<td>Request advertisements</td>
<td>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.</td>
</tr>
<tr>
<td>transmitted</td>
<td></td>
</tr>
<tr>
<td>Number of configuration</td>
<td>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.</td>
</tr>
<tr>
<td>revision errors</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>These errors means that the switch is filtering incoming advertisements, which causes the VTP database to become unsynchronized across the network.</td>
</tr>
<tr>
<td>Number of configuration</td>
<td>Number of MD5 digest errors.</td>
</tr>
<tr>
<td>digest errors</td>
<td>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 that the VTP password on all switches is the same.</td>
</tr>
<tr>
<td></td>
<td>These errors mean that the switch is filtering incoming advertisements, which causes the VTP database to become unsynchronized across the network.</td>
</tr>
</tbody>
</table>
This is an example of output from the `show vtp status` command. Table 2-32 describes each field in the display.

```
Switch> show vtp status
VTP Version : 2
Configuration Revision : 39
Maximum VLANs supported locally : 1005
Number of existing VLANs : 10
VTP Operating Mode : Server
VTP Domain Name :
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x77 0x26 0x9F 0x96 0x03 0x7D 0xFC 0xB2
Configuration last modified by 10.89.152.146 at 3-1-93 00:04:30
Local updater ID is 10.89.152.146 on interface Vl1 (lowest numbered VLAN interf)
```
### Table 2-32  `show vtp status` Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTP Version</td>
<td>Displays the VTP version operating on the switch. By default, the switch implements version 1 but can be set to version 2.</td>
</tr>
<tr>
<td>Configuration Revision</td>
<td>Current configuration revision number on this switch.</td>
</tr>
<tr>
<td>Maximum VLANs Supported Locally</td>
<td>Maximum number of VLANs supported locally.</td>
</tr>
<tr>
<td>Number of Existing VLANs</td>
<td>Number of existing VLANs.</td>
</tr>
<tr>
<td>VTP Operating Mode</td>
<td>Displays the VTP operating mode, which can be server, client, or transparent.</td>
</tr>
<tr>
<td></td>
<td><strong>Server:</strong> 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.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> 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.</td>
</tr>
<tr>
<td></td>
<td><strong>Client:</strong> 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.</td>
</tr>
<tr>
<td></td>
<td><strong>Transparent:</strong> 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.</td>
</tr>
<tr>
<td>VTP Domain Name</td>
<td>Name that identifies the administrative domain for the switch.</td>
</tr>
<tr>
<td>VTP Pruning Mode</td>
<td>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.</td>
</tr>
<tr>
<td>VTP V2 Mode</td>
<td>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.</td>
</tr>
<tr>
<td>VTP Traps Generation</td>
<td>Displays whether VTP traps are sent to a network management station.</td>
</tr>
<tr>
<td>MD5 Digest</td>
<td>A 16-byte checksum of the VTP configuration.</td>
</tr>
<tr>
<td>Configuration Last Modified</td>
<td>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.</td>
</tr>
<tr>
<td>Related Commands</td>
<td>Command</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>clear vtp counters</td>
</tr>
<tr>
<td></td>
<td>vtp (global configuration)</td>
</tr>
<tr>
<td></td>
<td>vtp (VLAN configuration)</td>
</tr>
</tbody>
</table>
show vtp