show access-group mode interface

To display the ACL configuration on a Layer 2 interface, use the `show access-group mode interface` command.

```
show access-group mode interface [interface interface-number]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface</code></td>
<td>(Optional) Interface type; valid values are ethernet, fastethernet, gigabitethernet, tengigabitethernet, and port-channel.</td>
</tr>
<tr>
<td><code>interface-number</code></td>
<td>(Optional) Interface number.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The valid values for the port number depend on the chassis used.

**Examples**

This example shows how to display the ACL configuration on the Fast Ethernet interface 6/1:

```
Switch# show access-group mode interface fa6/1
Interface FastEthernet6/1:
  Access group mode is: merge
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>access-group mode</td>
<td>Specifies the override modes (for example, VACL overrides PACL) and the non-override modes (for example, merge or strict mode).</td>
</tr>
</tbody>
</table>
show adjacency

To display information about the Layer 3 switching adjacency table, use the `show adjacency` command.

```
show adjacency [[interface interface-number] | [null interface-number] | [port-channel number] |
[vlan vlan-id] | detail | internal | summary]
```

**Syntax Description**

- **interface** (Optional) Interface type; possible valid values are `ethernet`, `fastethernet`, `gigabitethernet`, `tengigabitethernet`, `pos`, `ge-wan`, and `atm`.
- **interface-number** (Optional) Module and port number; see the “Usage Guidelines” section for valid values.
- **null interface-number** (Optional) Specifies the null interface; the valid value is `0`.
- **port-channel number** (Optional) Specifies the channel interface; valid values are a maximum of 64 values ranging from 1 to 256.
- **vlan vlan-id** (Optional) Specifies the VLAN; valid values are from 1 to 4094.
- **detail** (Optional) Displays the information about the protocol detail and timer.
- **internal** (Optional) Displays the information about the internal data structure.
- **summary** (Optional) Displays a summary of CEF-adjacency information.

**Defaults**

This command has no default settings.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EW</td>
<td>Extended to include the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The `interface-number` argument designates the module and port number. Valid values for `interface-number` depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13, and valid values for the port number are from 1 to 48.

Hardware Layer 3 switching adjacency statistics are updated every 60 seconds.

The following information is contained in the `show adjacency` command:

- Protocol interface.
- Type of routing protocol that is configured on the interface.
- Interface address.
- Method of adjacency that was learned.
- MAC address of the adjacent router.
- Time left before the adjacency rolls out of the adjacency table. After it rolls out, a packet must use the same next hop to the destination.

**Examples**

This example shows how to display adjacency information:

```
Switch# show adjacency
Protocol Interface                 Address
IP       FastEthernet2/3           172.20.52.1(3045)
IP       FastEthernet2/3           172.20.52.22(11)
Switch#
```

This example shows how to display a summary of adjacency information:

```
Switch# show adjacency summary
Adjacency Table has 2 adjacencies
  Interface                Adjacency Count
  FastEthernet2/3               2
Switch#
```

This example shows how to display protocol detail and timer information:

```
Switch# show adjacency detail
Protocol Interface                 Address
IP       FastEthernet2/3           172.20.52.1(3045)
  0 packets, 0 bytes
  000000000FF9200003800000000000000
  00000000000000000000000000000000
  00605C865B2800D0BB0F980B0800
  ARP                     03:58:12
IP       FastEthernet2/3           172.20.52.22(11)
  0 packets, 0 bytes
  000000000FF9200003800000000000000
  00000000000000000000000000000000
  00801C93804000D0BB0F980B0800
  ARP                     03:58:06
Switch#
```

This example shows how to display adjacency information for a specific interface:

```
Switch# show adjacency fastethernet2/3
Protocol Interface                 Address
IP       FastEthernet2/3           172.20.52.1(3045)
IP       FastEthernet2/3           172.20.52.22(11)
Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>debug adjacency</td>
<td>Displays information about the adjacency debugging.</td>
</tr>
</tbody>
</table>
show ancp multicast

To display multicast streams activated by Access Node Control Protocol (ANCP), use the `show ancp multicast` command.

`show ancp multicast [group groupaddr] [source sourceaddr] [interface interfacename]`

**Syntax Description**

- **group groupaddr**  (Optional) Specifies a multicast group address.
- **source sourceaddr**  (Optional) Specifies a multicast source address.
- **interface interfacename**  (Optional) Specifies a multicast flowing on a specific interface.

**Defaults**

Displays all the multicast streams activated with ANCP.

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(50)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display multicast streams activated by ANCP:

```
ANCP-Client# show ancp multicast
ANCP Multicast Streams
ClientID VLAN Interface Joined on
Group 235.3.2.1
 0x01060004000A0703 10 Fa7/3 18:27:35 UTC Sat Sep 13 2008
 0x0106000400140703 20 Fa7/3 18:27:35 UTC Sat Sep 13 2008
 0x01060004000A0704 10 Fa7/4 18:25:43 UTC Sat Sep 13 2008
 0x0106000400140704 20 Fa7/4 18:25:43 UTC Sat Sep 13 2008
Group 238.1.2.3
 0x01060004000A0703 10 Fa7/3 18:27:37 UTC Sat Sep 13 2008
 0x0106000400140703 20 Fa7/3 18:27:35 UTC Sat Sep 13 2008
 0x01060004000A0704 10 Fa7/4 18:25:43 UTC Sat Sep 13 2008
 0x0106000400140704 20 Fa7/4 18:25:43 UTC Sat Sep 13 2008
ANCP-Client#
```
show arp access-list

To display detailed information on an ARP access list, use the `show arp` command.

```
show arp access-list
```

Syntax Description

This command has no arguments or keywords.

Defaults

This command has no default settings.

Command Modes

EXEC

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

Examples

This example shows how to display the ARP ACL information for a switch:

```
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>access-group mode</td>
<td>Specifies the override modes (for example, VACL overrides PACL) and the non-override modes (for example, merge or strict mode).</td>
</tr>
<tr>
<td>arp access-list</td>
<td>Defines an ARP access list or adds clauses at the end of a predefined list.</td>
</tr>
<tr>
<td>ip arp inspection filter vlan</td>
<td>Permits ARPs from hosts that are configured for static IP when DAI is enabled, defines an ARP access list, and applies the access list to a VLAN.</td>
</tr>
</tbody>
</table>
show authentication

To display the Auth Manager information, use the `show authentication` command in EXEC or Privileged EXEC mode.

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

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface interface</td>
<td>Displays all of the Auth Manager details associated with the specified interface.</td>
</tr>
<tr>
<td>registrations</td>
<td>Displays details of all methods registered with the Auth Manager.</td>
</tr>
<tr>
<td>sessions</td>
<td>Displays details of the current Auth Manager sessions (for example, client devices). If you do not enter any optional specifiers, all current active sessions are displayed. You can enter the specifiers singly or in combination to display a specific session (or group of sessions).</td>
</tr>
<tr>
<td>session-id session-id</td>
<td>(Optional) Specifies an Auth Manager session.</td>
</tr>
<tr>
<td>handle handle</td>
<td>(Optional) Specifies the particular handle for which Auth Manager information is displayed. Range is 1 to 4294967295.</td>
</tr>
<tr>
<td>mac mac</td>
<td>(Optional) Displays Auth Manager session information for a specified MAC address.</td>
</tr>
</tbody>
</table>
| method method | (Optional) Displays all clients authorized by a specified authentication method. Valid values are as follows:  
  - dot1x  
  - mab  
  - webauth |

**Command Default**

This command has no default settings.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(50)SG</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Table 2-19 describes the significant fields shown in the show authentication display.

**Note**

The possible values for the status of sessions are given below. For a session in terminal state, “Authz Success” or “Authz Failed” are displayed. “No methods” is displayed if no method has provided a result.
Table 2-19  show authentication Command Output

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle</td>
<td>The session has been initialized and no methods have run yet.</td>
</tr>
<tr>
<td>Running</td>
<td>A method is running for this session.</td>
</tr>
<tr>
<td>No methods</td>
<td>No method has provided a result for this session.</td>
</tr>
<tr>
<td>Authc Success</td>
<td>A method has resulted in authentication success for this session.</td>
</tr>
<tr>
<td>Authc Failed</td>
<td>A method has resulted in authentication fail for this session.</td>
</tr>
<tr>
<td>Authz Success</td>
<td>All features have been successfully applied for this session.</td>
</tr>
<tr>
<td>Authz Failed</td>
<td>A feature has failed to be applied for this session.</td>
</tr>
</tbody>
</table>

Table 2-20 lists the possible values for the state of methods. For a session in terminal state, “Authc Success,” “Authc Failed,” or “Failed over” are displayed (the latter indicates a method ran and failed over to the next method which did not provide a result. “Not run” is displayed in the case of sessions that are synchronized on standby.

Table 2-20  State Method Values

<table>
<thead>
<tr>
<th>Method State</th>
<th>State Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not run</td>
<td>Terminal</td>
<td>The method has not run for this session.</td>
</tr>
<tr>
<td>Running</td>
<td>Intermediate</td>
<td>The method is running for this session.</td>
</tr>
<tr>
<td>Failed over</td>
<td>Terminal</td>
<td>The method has failed and the next method is expected to provide a result.</td>
</tr>
<tr>
<td>Authc Success</td>
<td>Terminal</td>
<td>The method has provided a successful authentication result for the session.</td>
</tr>
<tr>
<td>Authc Failed</td>
<td>Terminal</td>
<td>The method has provided a failed authentication result for the session.</td>
</tr>
</tbody>
</table>

Examples

The following example shows how to display authentication methods registered with Auth Manager:

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

The following example shows how to display Auth Manager details for a specific interface:

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

3 0 dot1x
Runnable methods list:
Handle Priority Name
3 0 dot1x
Switch#

The following example shows how to display all Auth Manager sessions on the switch:

Switch# show authentication sessions

<table>
<thead>
<tr>
<th>Interface</th>
<th>MAC Address</th>
<th>Method</th>
<th>Domain</th>
<th>Status</th>
<th>Session ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi3/45</td>
<td>(unknown)</td>
<td>N/A</td>
<td>DATA</td>
<td>Authz Failed</td>
<td>0908140400000007003651EC</td>
</tr>
<tr>
<td>Gi3/46</td>
<td>(unknown)</td>
<td>N/A</td>
<td>DATA</td>
<td>Authz Success</td>
<td>09081404000000080057C274</td>
</tr>
</tbody>
</table>

The following example shows how to display all Auth Manager sessions on an interface:

Switch# show authentication sessions int gi 3/46

Interface: GigabitEthernet3/46
MAC Address: Unknown
IP Address: Unknown
Status: Authz Success
Domain: DATA
Oper host mode: multi-host
Oper control dir: both
Authorized By: Guest Vlan
Vlan Policy: 4094
Session timeout: N/A
Idle timeout: N/A
Common Session ID: 09081404000000080057C274
Acct Session ID: 0x0000000A
Handle: 0xCC000008

Runnable methods list:
Method   State
dot1x    Failed over

The following example shows how to display Auth Manager session for a specified MAC address:

Switch# show authentication sessions mac 000e.84af.59bd

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

The following example shows how to display all clients authorized via a specified auth method:

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>authentication control-direction</code></td>
<td>Changes the port control to unidirectional or bidirectional.</td>
</tr>
<tr>
<td><code>authentication critical recovery delay</code></td>
<td>Configures the 802.1X critical authentication parameters.</td>
</tr>
<tr>
<td><code>authentication event</code></td>
<td>Configures the actions for authentication events.</td>
</tr>
<tr>
<td><code>authentication fallback</code></td>
<td>Enables the Webauth fallback and specifies the fallback profile to use when failing over to Webauth.</td>
</tr>
<tr>
<td><code>authentication host-mode</code></td>
<td>Defines the classification of a session that will be used to apply the access-policies using the host-mode configuration.</td>
</tr>
<tr>
<td><code>authentication open</code></td>
<td>Enables open access on this port.</td>
</tr>
<tr>
<td><code>authentication order</code></td>
<td>Specifies the order in which authentication methods should be attempted for a client on an interface.</td>
</tr>
<tr>
<td><code>authentication periodic</code></td>
<td>Enables reauthentication for this port.</td>
</tr>
<tr>
<td><code>authentication port-control</code></td>
<td>Configures the port-control value.</td>
</tr>
<tr>
<td><code>authentication priority</code></td>
<td>Specifies the priority of authentication methods on an interface.</td>
</tr>
<tr>
<td><code>authentication timer</code></td>
<td>Configures the authentication timer.</td>
</tr>
<tr>
<td><code>authentication violation</code></td>
<td>Specifies the action to be taken when a security violation exists on a port.</td>
</tr>
</tbody>
</table>
show auto install status

To display the status of an automatic installation, use the show auto install status command.

```
show auto install status
```

Syntax Description

This command has no arguments or keywords.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

```
Release     Modification
12.2(20)EW  Support for this command was introduced on the Catalyst 4500 series switch.
```

Examples

This example shows how to display the IP address of the TFTP server and to display whether or not the switch is currently acquiring the configuration file on the TFTP server:

```
Switch# show auto install status

Status : Downloading config file
DHCP Server : 20.0.0.1
TFTP Server : 30.0.0.3
Config File Fetched : Undetermined

The first IP address in the display indicates the server that is used for the automatic installation. The second IP address indicates the TFTP server that provided the configuration file.
```
show auto qos

To display the automatic quality of service (auto-QoS) configuration that is applied, use the show auto qos user EXEC command.

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

**Syntax Description**

- `interface interface-id` (Optional) Displays auto-QoS information for the specified interface or for all interfaces. Valid interfaces include physical ports.
- `begin` (Optional) Begins with the line that matches the expression.
- `exclude` (Optional) Excludes lines that match the expression.
- `include` (Optional) Includes lines that match the specified expression.
- `expression` (Optional) Expression in the output to use as a reference point.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The `show auto qos interface interface-id` command displays the auto-QoS configuration; it does not display any user changes to the configuration that might be in effect.

To display information about the QoS configuration that might be affected by auto-QoS on a non-Supervisor Engine 6-E, use one of these commands:

- `show qos`
- `show qos map`
- `show qos interface interface-id`
- `show running-config`

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 output from the `show auto qos` command when auto-QoS is enabled:

```
Switch# show auto qos
GigabitEthernet1/2
auto qos voip cisco-phone
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto qos voip</td>
<td>Automatically configures quality of service (auto-QoS) for Voice over IP (VoIP) within a QoS domain.</td>
</tr>
</tbody>
</table>
show bootflash:

To display information about the bootflash: file system, use the show bootflash: command.

show bootflash: [all | chips | filesys]

Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>(Optional) Displays all possible Flash information.</td>
</tr>
<tr>
<td>chips</td>
<td>(Optional) Displays Flash chip information.</td>
</tr>
<tr>
<td>filesys</td>
<td>(Optional) Displays file system information.</td>
</tr>
</tbody>
</table>

Defaults

This command has no default settings.

Command Modes

EXEC

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
<td></td>
</tr>
</tbody>
</table>

Examples

This example shows how to display file system status information:

Switch> show bootflash: filesys

-------- F I L E S Y S T E M S T A T U S --------
Device Number = 0
DEVEICE INFO BLOCK: bootflash
Magic Number = 6887635  File System Vers = 10000  (1.0)
Length = 1000000  Sector Size = 40000
Programming Algorithm = 39  Erased State = FFFFFFFF
File System Offset = 40000  Length = F40000
MONLIB Offset = 100  Length = C628
Bad Sector Map Offset = 3FFF8  Length = 8
Squeeze Log Offset = F80000  Length = 40000
Squeeze Buffer Offset = PC0000  Length = 40000
Num Spare Sectors = 0
Spares:
STATUS INFO:
Writable
NO File Open for Write
Complete Stats
No Unrecovered Errors
No Squeeze in progress
USAGE INFO:
Bytes Used = 917CE8  Bytes Available = 628318
Bad Sectors = 0  Spared Sectors = 0
OK Files = 2  Bytes = 917BE8
Deleted Files = 0  Bytes = 0
Files w/Errors = 0  Bytes = 0

Switch>
This example shows how to display system image information:

```
Switch> show bootflash:
-# - ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
1   .. image    8C5A393A  237E3C   14  2063804 Aug 23 1999 16:18:45 c4-boot-mz
2   .. image    D86EE0AD  957CE8    9  7470636 Sep 20 1999 13:48:49 rp.halley
Switch>
```

This example shows how to display all bootflash information:

```
Switch> show bootflash: all
-# - ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
1   .. image    8C5A393A  237E3C   14  2063804 Aug 23 1999 16:18:45 c4-boot-mz
2   .. image    D86EE0AD  957CE8    9  7470636 Sep 20 1999 13:48:49 rp.halley

6456088 bytes available (9534696 bytes used)

---------- FILE SYSTEM STATUS ----------
Device Number = 0
DEVICE INFO BLOCK: bootflash
  Magic Number          = 6887635   File System Vers = 10000  (1.0)
  Length                = 1000000   Sector Size      = 40000
  Programming Algorithm = 39        Erased State     = FFFFFFFF
  File System Offset    = 40000     Length = F40000
  MONLIB Offset         = 100       Length = C628
  Bad Sector Map Offset = 3FFF8     Length = 8
  Squeeze Log Offset    = F80000    Length = 40000
  Squeeze Buffer Offset = FC0000    Length = 40000
  Num Spare Sectors     = 0

  Spares:

  STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress

  USAGE INFO:
  Bytes Used       = 917CE8       Bytes Available = 628318
  Bad Sectors      = 0           Spared Sectors  = 0
  OK Files         = 2           Bytes = 917BE8
  Deleted Files    = 0           Bytes = 0
  Files w/Errors   = 0           Bytes = 0

Switch>
```
To display BOOT environment variable information, use the `show bootvar` command.

```
show bootvar
```

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

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display BOOT environment variable information:

```
Switch# show bootvar
BOOT variable = sup:1;
CONFIG_FILE variable does not exist
BOOTLDR variable does not exist
Configuration register is 0x0
Switch#
```
show cable-diagnostics tdr

To display the test results for the TDR cable diagnostics, use the `show cable-diagnostics tdr` command.

```
show cable-diagnostics tdr [interface {interface interface-number}]}
```

**Note**

This command will be deprecated in future Cisco IOS releases; use the `diagnostic start` command instead.

**Syntax Description**

- `interface interface`: Interface type; valid values are `fastethernet` and `gigabitethernet`.
- `interface-number`: Module and port number.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The TDR test is supported on Catalyst 4500 Series Switches running Cisco IOS Release 12.2(25)SG for the following line cards only:

- WS-X4548-GB-RJ45
- WS-X4548-GB-RJ45V
- WS-X4524-GB-RJ45V
- WS-X4013+TS
- WS-C4948
- WS-C4948-10GE

The distance to the fault is displayed in meters (m).

**Examples**

This example shows how to display information about the TDR test:

```
Switch# show cable-diagnostics tdr interface gi4/13
Interface Speed Local pair Cable length Remote channel Status
Gi4/13 0Mbps 1-2 102 +2m Unknown Fault
3-6 100 +2m Unknown Fault
4-5 102 +2m Unknown Fault
7-8 102 +2m Unknown Fault
Switch#
```
Table 2-21 describes the fields in the `show cable-diagnostics tdr` command output.

### Table 2-21  `show cable-diagnostics tdr` Command Output Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Interface tested.</td>
</tr>
<tr>
<td>Speed</td>
<td>Current line speed.</td>
</tr>
<tr>
<td>Pair</td>
<td>Local pair name.</td>
</tr>
<tr>
<td>Cable Length</td>
<td>Distance to the fault in meters (m).</td>
</tr>
<tr>
<td>Channel</td>
<td>Pair designation (A, B, C, or D).</td>
</tr>
<tr>
<td>Status</td>
<td>Pair status displayed is one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Terminated—The link is up.</td>
</tr>
<tr>
<td></td>
<td>• Fault—Cable fault (open or short)</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>test cable-diagnostics tdr</code></td>
<td>Tests the condition of copper cables on 48-port 10/100/1000 BASE-T modules.</td>
</tr>
</tbody>
</table>
show call-home

To display the configured CallHome information, use the show call-home command in privileged EXEC mode.

    show call-home [alert-group | detail | mail-server | profile {all | name} | statistics]

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>alert-group</td>
<td>(Optional) Displays the available alert group.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Displays the CallHome configuration in detail.</td>
</tr>
<tr>
<td>mail-server</td>
<td>(Optional) Displays the CallHome mail server-related information.</td>
</tr>
<tr>
<td>profile all</td>
<td>(Optional) Displays configuration information for all existing profiles.</td>
</tr>
<tr>
<td>profile name</td>
<td>(Optional) Displays configuration information for a specific destination profile.</td>
</tr>
<tr>
<td>statistics</td>
<td>(Optional) Displays the CallHome statistics.</td>
</tr>
</tbody>
</table>

**Command Default**

This command has no default settings.

**Command Modes**

Privileged EXEC (#)

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(52)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch, Supervisor Engine 6-E, and Catalyst 4900M chassis.</td>
</tr>
</tbody>
</table>

**Examples**

The following example displays the configured CallHome settings:

Switch# show call-home
Current show home settings:
    call home feature : disable
    call home message's from address: switch@example.com
    call home message's reply-to address: support@example.com

    vrf for call-home messages: Not yet set up
    contact person's email address: technical@example.com

    contact person's phone number: +1-408-555-1234
    street address: 1234 Picaboo Street, Any city, Any state, 12345
    customer ID: ExampleCorp
    contract ID: X123456789
    site ID: SantaClar
    Mail-server[1]: Address: smtp.example.com Priority: 1
    Mail-server[2]: Address: 192.168.0.1 Priority: 2
    Rate-limit: 20 message(s) per minute
Available alert groups:

<table>
<thead>
<tr>
<th>Keyword</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configuration</td>
<td>Disable</td>
<td>configuration info</td>
</tr>
<tr>
<td>diagnostic</td>
<td>Disable</td>
<td>diagnostic info</td>
</tr>
<tr>
<td>environment</td>
<td>Disable</td>
<td>environmental info</td>
</tr>
<tr>
<td>inventory</td>
<td>Enable</td>
<td>inventory info</td>
</tr>
<tr>
<td>syslog</td>
<td>Disable</td>
<td>syslog info</td>
</tr>
</tbody>
</table>

Profiles:

- Profile Name: campus-noc
- Profile Name: CiscoTAC-1

Switch#

**Configured CallHome Information in Detail**

Switch# `show call-home detail`

Current call home settings:

- call home feature : disable
- call home message's from address: switch@example.com
- call home message's reply-to address: support@example.com
- vrf for call-home messages: Not yet set up
- contact person's email address: technical@example.com
- contact person's phone number: +1-408-555-1234
- street address: 1234 Picaboo Street, Any city, Any state, 12345
- customer ID: ExampleCorp
- contract ID: X123456789
- site ID: SantaClara
- Mail-server[1]: Address: smtp.example.com Priority: 1
- Mail-server[2]: Address: 192.168.0.1 Priority: 2
- Rate-limit: 20 message(s) per minute

Available alert groups:

<table>
<thead>
<tr>
<th>Keyword</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configuration</td>
<td>Disable</td>
<td>configuration info</td>
</tr>
<tr>
<td>diagnostic</td>
<td>Disable</td>
<td>diagnostic info</td>
</tr>
<tr>
<td>environment</td>
<td>Disable</td>
<td>environmental info</td>
</tr>
<tr>
<td>inventory</td>
<td>Enable</td>
<td>inventory info</td>
</tr>
<tr>
<td>syslog</td>
<td>Disable</td>
<td>syslog info</td>
</tr>
</tbody>
</table>

Profiles:

- Profile Name: campus-noc
  - Profile status: ACTIVE
  - Preferred Message Format: long-text
  - Message Size Limit: 3145728 Bytes
  - Transport Method: email
  - Email address(es): noc@example.com
  - HTTP address(es): Not yet set up
  - Alert-group Severity
    - inventory normal
  - Syslog-Pattern Severity
    - N/A

- Profile Name: CiscoTAC-1
  - Profile status: ACTIVE
  - Preferred Message Format: xml
Message Size Limit: 3145728 Bytes
Transport Method: email
Email address(es): callhome@cisco.com
HTTP address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService

Periodic configuration info message is scheduled every 1 day of the month at 09:27
Periodic inventory info message is scheduled every 1 day of the month at 09:12

Alert-group Severity
------------------------  ------------
diagnostic               minor
environment              warning
inventory                normal

Syslog-Pattern Severity
------------------------  ------------
.*                        major

Available Call Home Alert Groups

Switch# show call-home alert-group
Available alert groups:

Keyword                  State   Description
------------------------ ------- -------------------------------
configuration            Disable configuration info
diagnostic               Disable diagnostic info
environment              Disable environmental info
inventory                Enable inventory info
syslog                   Disable syslog info

E-Mail Server Status Information

Switch# show call-home mail-server status
Please wait. Checking for mail server status ...
Translating "smtp.example.com"
Mail-server[1]: Address: smtp.example.com Priority: 1 [Not Available]
Mail-server[2]: Address: 192.168.0.1 Priority: 2 [Not Available]

Information for All Destination Profiles (Predefined and User-Defined)

Switch# show call-home profile all
Profile Name: campus-noc
Profile status: ACTIVE
Preferred Message Format: long-text
Message Size Limit: 3145728 Bytes
Transport Method: email
Email address(es): noc@example.com
HTTP address(es): Not yet set up

Alert-group Severity
------------------------  ------------
inventory               normal

Syslog-Pattern Severity
------------------------  ------------
N/A                     N/A
Profile Name: CiscoTAC-1
Profile status: ACTIVE
Preferred Message Format: xml
Message Size Limit: 3145728 Bytes
Transport Method: email
Email address(es): callhome@cisco.com
HTTP address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService

Periodic configuration info message is scheduled every 1 day of the month at 09:27
Periodic inventory info message is scheduled every 1 day of the month at 09:12

Alert-group               Severity
------------------------  ------------
diagnostic                minor
environment               warning
inventory                 normal

Syslog-Pattern            Severity
------------------------  ------------
.*                        major

Switch# Information for a User-Defined Destination Profile
Switch# show call-home profile CiscoTAC-1
Profile Name: CiscoTAC-1
Profile status: INACTIVE
Preferred Message Format: xml
Message Size Limit: 3145728 Bytes
Transport Method: email
Email address(es): callhome@cisco.com
HTTP address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService

Periodic configuration info message is scheduled every 11 day of the month at 11:25
Periodic inventory info message is scheduled every 11 day of the month at 11:10

Alert-group               Severity
------------------------  ------------
diagnostic                minor
environment               warning
inventory                 normal

Syslog-Pattern            Severity
------------------------  ------------
.*                        major

Switch# Call Home Statistics
Switch# show call-home statistics
Message Types    Total    Email    HTTP
-------------   --------    ------    ------
Total Success   0         0        0
Config         0         0        0
Diagnostic     0         0        0
Environment    0         0        0
Inventory      0         0        0
SysLog         0         0        0
Test           0         0        0
Request        0         0        0
Send-CLI       0         0        0
show call-home

Total In-Queue 0 0 0
  Config 0 0 0
  Diagnostic 0 0 0
  Environment 0 0 0
  Inventory 0 0 0
  SysLog 0 0 0
  Test 0 0 0
  Request 0 0 0
  Send-CLI 0 0 0

Total Failed 0 0 0
  Config 0 0 0
  Diagnostic 0 0 0
  Environment 0 0 0
  Inventory 0 0 0
  SysLog 0 0 0
  Test 0 0 0
  Request 0 0 0
  Send-CLI 0 0 0

Total RateLimit
  -dropped 0 0 0
  Config 0 0 0
  Diagnostic 0 0 0
  Environment 0 0 0
  Inventory 0 0 0
  SysLog 0 0 0
  Test 0 0 0
  Request 0 0 0
  Send-CLI 0 0 0

Last call-home message sent time: n/a

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>call-home (global configuration)</td>
<td>Enters call-home configuration mode.</td>
</tr>
<tr>
<td></td>
<td>call-home send alert-group</td>
<td>Sends a specific alert group message.</td>
</tr>
<tr>
<td></td>
<td>service call-home (refer to Cisco IOS</td>
<td>Enables or disables call home.</td>
</tr>
<tr>
<td></td>
<td>documentation)</td>
<td></td>
</tr>
</tbody>
</table>
show cdp neighbors

To display detailed information about the neighboring devices that are discovered through CDP, use the `show cdp neighbors` command.

```
show cdp neighbors [type number] [detail]
```

**Syntax Description**

- `type` (Optional) Interface type that is connected to the neighbors about which you want information; possible valid values are `ethernet`, `fastethernet`, `gigabitethernet`, `tengigabitethernet`, `port-channel`, and `vlan`.

- `number` (Optional) Interface number that is connected to the neighbors about which you want information.

- `detail` (Optional) Displays detailed information about a neighbor (or neighbors) including network address, enabled protocols, hold time, and software version.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EW</td>
<td>Extended to include the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The `vlan` keyword is supported in Catalyst 4500 Series Switches that are configured with a Supervisor Engine 2.

The `port-channel` values are from 0 to 282; values from 257 to 282 are supported on the CSM and the FWSM only.

**Examples**

This example shows how to display the information about the CDP neighbors:

```
Switch# show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID          Local Intf   Holdtime   Capability          Platform       Port ID
lab-7206           Eth 0        157        R 7206VXR          Fast 0/0/0
lab-as5300-1        Eth 0        163        R AS5300           Fast 0
lab-as5300-2        Eth 0        159        R AS5300           Eth 0
lab-as5300-3        Eth 0        122        R AS5300           Eth 0
lab-as5300-4        Eth 0        132        R AS5300           Fast 0/0
lab-3621            Eth 0        140        R S 3631-telcoFast 0/0
008024 2758E0        Eth 0        132        T CAT3000           1/2
Switch#
```
Table 2-22 describes the fields that are shown in the example.

### Table 2-22 show cdp neighbors Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device ID</td>
<td>Configured ID (name), MAC address, or serial number of the neighbor device.</td>
</tr>
<tr>
<td>Local Intrfce</td>
<td>(Local Interface) The protocol that is used by the connectivity media.</td>
</tr>
<tr>
<td>Holdtime</td>
<td>(Holdtime) Remaining amount of time, in seconds, that the current device holds the CDP advertisement from a transmitting router before discarding it.</td>
</tr>
<tr>
<td>Capability</td>
<td>Capability code that is discovered on the device. This device type is listed in the CDP Neighbors table. Possible values are as follows: R—Router, T—Transparent bridge, B—Source-routing bridge, S—Switch, H—Host, I—IGMP device, r—Repeater, P—Phone</td>
</tr>
<tr>
<td>Platform</td>
<td>Product number of the device.</td>
</tr>
<tr>
<td>Port ID</td>
<td>Protocol and port number of the device.</td>
</tr>
</tbody>
</table>

This example shows how to display detailed information about your CDP neighbors:

```
Switch# show cdp neighbors detail
Device ID: lab-7206
Entry address(es):
    IP address: 172.19.169.83
Platform: cisco 7206VXR, Capabilities: Router
Interface: Ethernet0, Port ID (outgoing port): FastEthernet0/0/0
Holdtime: 123 sec

Version:
Cisco Internetwork Operating System Software
IOS (tm) 5800 Software (C5800-P4-M), Version 12.1(2)
Copyright (c) 1986-2002 by Cisco Systems, Inc.

advertisement version: 2
Duplex: half

--------------------
Device ID: lab-as5300-1
Entry address(es):
    IP address: 172.19.169.87

Switch#
```
Table 2-23 describes the fields that are shown in the example.

Table 2-23  show cdp neighbors detail Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device ID</td>
<td>Name of the neighbor device and either the MAC address or the serial number of this device.</td>
</tr>
<tr>
<td>Entry address(es)</td>
<td>List of network addresses of neighbor devices.</td>
</tr>
<tr>
<td>[network protocol] address</td>
<td>Network address of the neighbor device. The address can be in IP, IPX, AppleTalk, DECnet, or CLNS protocol conventions.</td>
</tr>
<tr>
<td>Platform</td>
<td>Product name and number of the neighbor device.</td>
</tr>
<tr>
<td>Capabilities</td>
<td>Device type of the neighbor. This device can be a router, a bridge, a transparent bridge, a source-routing bridge, a switch, a host, an IGMP device, or a repeater.</td>
</tr>
<tr>
<td>Interface</td>
<td>Protocol and port number of the port on the current device.</td>
</tr>
<tr>
<td>Holdtime</td>
<td>Remaining amount of time, in seconds, that the current device holds the CDP advertisement from a transmitting router before discarding it.</td>
</tr>
<tr>
<td>Version:</td>
<td>Software version running on the neighbor device.</td>
</tr>
<tr>
<td>advertisement version:</td>
<td>Version of CDP that is being used for CDP advertisements.</td>
</tr>
<tr>
<td>Duplex:</td>
<td>Duplex state of connection between the current device and the neighbor device.</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show cdp (refer to Cisco IOS documentation)</td>
<td>Displays global CDP information, including timer and hold-time information.</td>
</tr>
<tr>
<td>show cdp entry (refer to Cisco IOS documentation)</td>
<td>Displays information about a specific neighboring device discovered using Cisco Discovery Protocol (CDP).</td>
</tr>
<tr>
<td>show cdp interface (refer to Cisco IOS documentation)</td>
<td>Displays information about the interfaces on which Cisco Discovery Protocol (CDP) is enabled.</td>
</tr>
<tr>
<td>show cdp traffic (refer to Cisco IOS documentation)</td>
<td>Displays traffic information from the CDP table.</td>
</tr>
</tbody>
</table>
show class-map

To display class map information, use the `show class-map` command.

```
show class-map class_name
```

**Syntax Description**

```
class_name Name of the class map.
```

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)SG</td>
<td>Displays results from the full-flow option.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display class map information for all class maps:

```
Switch# show class-map
Class Map match-any class-default (id 0)
  Match any
Class Map match-any class-simple (id 2)
  Match any
Class Map match-all ipp5 (id 1)
  Match ip precedence 5
Class Map match-all agg-2 (id 3)
Switch#
```

This example shows how to display class map information for a specific class map:

```
Switch# show class-map ipp5
Class Map match-all ipp5 (id 1)
  Match ip precedence 5
Switch#
```

Assume there are two active flows as shown below on Fast Ethernet interface 6/1:

```
SrcIp      DstIp      IpProt SrcL4Port DstL4Port
----------- ----------- ------- ------- -------
192.168.10.10 192.168.20.20 20  6789  81
192.168.10.10 192.168.20.20 20  6789  21
```

With following configuration, each flow will be policed to a 1000000 bps with an allowed 9000-byte burst value.

```
Note
```

If you use the `match flow ip source-address|destination-address` command, these two flows are consolidated into one flow and they have the same source and destination address.
show class-map

Switch# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# class-map c1
Switch(config-cmap)# match flow ip source-address ip destination-address ip protocol 14 source-port 14 destination-port
Switch(config-cmap)# exit
Switch(config)# policy-map p1
Switch(config-pmap)# class c1
Switch(config-pmap-c)# police 1000000 9000
Switch(config-pmap-c)# exit
Switch(config-pmap)# exit
Switch(config)# interface fastEthernet 6/1
Switch(config-if)# service-policy input p1
Switch(config-if)# end
Switch# write memory
Switch# show policy-map interface
FastEthernet6/1
class-map c1
 match flow ip source-address ip destination-address ip protocol 14 source-port 14 destination-port

 policy-map p1
 class c1
  police 1000000 bps 9000 byte conform-action transmit exceed-action drop

 interface FastEthernet 6/1
  service-policy input p1

Switch# show class-map c1
Class Map match-all c1 (id 2)
  Match flow ip source-address ip destination-address ip protocol 14 source-port 14 destination-port
Switch#

## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>class-map</strong></td>
<td>Creates a class map to be used for matching packets to the class whose name you specify and to be used enter class-map configuration mode.</td>
</tr>
<tr>
<td><strong>show policy-map</strong></td>
<td>Displays information about the policy map.</td>
</tr>
<tr>
<td><strong>show policy-map interface</strong></td>
<td>Displays the statistics and configurations of the input and output policies that are attached to an interface.</td>
</tr>
</tbody>
</table>
show device-sensor cache

To display Device Sensor cache entries, use the `show device-sensor cache` command in privileged EXEC mode.

```
show device-sensor cache {mac mac-address | all}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mac</td>
<td>Specifies the MAC address of the device for which the sensor cache entries are to be displayed.</td>
</tr>
<tr>
<td>mac-address</td>
<td></td>
</tr>
<tr>
<td>all</td>
<td>Displays sensor cache entries for all devices.</td>
</tr>
</tbody>
</table>

**Defaults**

There are no defaults for this command.

**Command Modes**

Privileged EXEC

**Command History**

- **Release**
  - IOS XE 3.4.0SG and IOS 15.1(2)SG
- **Modification**
  - Command introduced on the Catalyst 4500 Series switch.

**Usage Guidelines**

Use the `show device-sensor cache` command to display a list of TLV fields or options received from a particular device or from all devices.

**Examples**

The following is sample output from the `show device-sensor cache mac mac-address` command:

```
Router# show device-sensor cache mac 0024.14dc.df4d
Device: 0024.14dc.df4d on port GigabitEthernet1/0/24
--------------------------------------------------
Proto   Type:Name                     Len Value
cdp     26:power-available-type        16 00 1A 00 10 00 00 00 01 00 00 00 FF FF FF FF
cdp     22:mgmt-address-type           17 00 16 00 11 00 00 00 01 01 01 CC 00 04 09 1B 65
cdp     11:duplex-type                  5 00 0B 00 05 01
cdp      9:vtp-mgmt-domain-type         4 00 09 00 04
cdp      4:capabilities-type            8 00 04 00 08 00 00 00 28
cdp      1:device-name                 14 00 01 00 0E 73 75 70 70 6C 69 63 61 6E 74
lldp     0:end-of-lldpdu                2 00 00
lldp     8:management-address          14 10 0C 05 01 09 1B 65 0E 03 00 00 00 01 00
lldp     7:system-capabilities          6 0E 04 00 14 00 04
lldp     4:port-description            23 08 15 47 69 67 61 62 69 74 45 74 68 65 72 6E 65
                     74 31 2F 30 2F 32 34
lldp     5:system-name                 12 0A 0A 73 75 70 70 6C 69 63 61 6E 74
dhcp     82:relay-agent-info           20 52 12 01 06 00 04 00 18 01 18 02 08 00 06 00 24
                     14 DC DF 80
dhcp     12:host-name                   12 0C 0A 73 75 70 70 6C 69 63 61 6E 74
dhcp     61:client-identifier          32 3D 1E 00 63 69 73 63 6F 2D 3D 30 32 34 2E 31 34
                     64 63 2E 64 66 34 64 2D 47 69 31 2F 30 2F 32 34
```

Catalyst 4500 Series Switch Cisco IOS Command Reference—Release IOS XE 3.4.0SG and IOS 15.1(2)SG

OL-27596 -01
The following is sample output from the `show device-sensor cache all` command:

```
Router# show device-sensor cache all
Device: 001c.0f74.8480 on port GigabitEthernet2/1
--------------------------------------------------
Proto   Type:Name                       Len  Value
dhcp    52:option-overload             3  34 01 03
dhcp    60:class-identifier            11  3C 09 64 6F 63 69 73 69 73 31 2E 30
 dhcp    55:parameter-request-list      8  37 06 01 42 06 03 43 96
 dhcp    61:client-identifier           27  3D 19 00 63 69 73 63 6F 63 6F 63 6F 2D 30 30 31 63 2E 30 66 37 34 2E 38 34 38 30 2D 56 31
 dhcp    57:max-message-size             4  39 02 04 80
Device: 000f.f7a7.234f on port GigabitEthernet2/1
--------------------------------------------------
Proto   Type:Name                       Len  Value
cdp     22:mgmt-address-type            8  00 16 00 08 00 00 00
 cdp     19:cos-type                    5  00 13 00 05 00
 cdp     18:trust-type                  5  00 12 00 05 00
 cdp     11:duplex-type                 5  00 0B 00 05 01
 cdp     10:native-vlan-type            6  00 0A 00 06 00 01
 cdp     9:vtp-mgmt-domain-type         9  00 09 00 09 63 69 73 63 6F
```

The following table describes the significant fields shown in the display:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>MAC address of the device and the interface which it is connected to.</td>
</tr>
<tr>
<td>Proto</td>
<td>Protocol from which the endpoint device data is being gleaned.</td>
</tr>
<tr>
<td>Type</td>
<td>Type of TLV.</td>
</tr>
<tr>
<td>Name</td>
<td>Name of the TLV.</td>
</tr>
<tr>
<td>Len</td>
<td>Length of the TLV.</td>
</tr>
<tr>
<td>Value</td>
<td>Value of the TLV.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>debug device-sensor</td>
<td>Enables debugging for Device Sensor.</td>
</tr>
<tr>
<td>device-sensor accounting</td>
<td>Adds the Device Sensor protocol data to accounting records and generates</td>
</tr>
<tr>
<td></td>
<td>additional accounting events when new sensor data is detected.</td>
</tr>
<tr>
<td>device-sensor filter-list</td>
<td>Creates a CDP or LLDP filter containing a list of options that can be</td>
</tr>
<tr>
<td></td>
<td>included or excluded in the Device Sensor output.</td>
</tr>
<tr>
<td>dhcp device-sensor filter-list</td>
<td>Creates a DHCP filter containing a list of options that can be included</td>
</tr>
<tr>
<td></td>
<td>or excluded in the Device Sensor output.</td>
</tr>
<tr>
<td>show device-sensor cache</td>
<td>Displays Device Sensor cache entries.</td>
</tr>
</tbody>
</table>
show diagnostic content

To display test information about the test ID, test attributes, and supported coverage test levels for each test and for all modules, use the `show diagnostic content` command.

```
show diagnostic content module {all | num}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Displays all the modules on the chassis.</td>
</tr>
<tr>
<td>num</td>
<td>Module number.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(20)EWA</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the test suite, monitoring interval, and test attributes for all the modules of the chassis:

```
Switch# show diagnostic content module all

module 1:

Diagnostics test suite attributes:
B/* - Basic ondemand test / NA
P/V/* - Per port test / Per device test / NA
D/N/* - Disruptive test / Non-disruptive test / NA
S/* - Only applicable to standby unit / NA
X/* - Not a health monitoring test / NA
F/* - Fixed monitoring interval test / NA
E/* - Always enabled monitoring test / NA
A/I - Monitoring is active / Monitoring is inactive
m/* - Mandatory bootup test, can't be bypassed / NA
0/* - Ongoing test, always active / NA

<table>
<thead>
<tr>
<th>ID</th>
<th>Test Name</th>
<th>Attributes</th>
<th>Testing Interval (day hh:mm:ss.ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>supervisor-bootup</td>
<td><strong>D****I</strong></td>
<td>not configured</td>
</tr>
<tr>
<td>2</td>
<td>packet-memory-bootup</td>
<td><strong>D****I</strong></td>
<td>not configured</td>
</tr>
<tr>
<td>3</td>
<td>packet-memory-ongoing</td>
<td><strong>N****I</strong></td>
<td>not configured</td>
</tr>
</tbody>
</table>
```
module 6:

Diagnostics test suite attributes:

- B/* - Basic ondemand test / NA
- P/V/* - Per port test / Per device test / NA
- D/N/* - Disruptive test / Non-disruptive test / NA
- S/* - Only applicable to standby unit / NA
- X/* - Not a health monitoring test / NA
- F/* - Fixed monitoring interval test / NA
- E/* - Always enabled monitoring test / NA
- A/I - Monitoring is active / Monitoring is inactive
- m/* - Mandatory bootup test, can’t be bypassed / NA
- o/* - Ongoing test, always active / NA

<table>
<thead>
<tr>
<th>ID</th>
<th>Test Name</th>
<th>Attributes</th>
<th>Testing Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>linecard-online-diag</td>
<td><strong>D</strong>*I**</td>
<td>not configured</td>
</tr>
</tbody>
</table>

Switch#

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>show diagnostic result module</td>
<td>Displays the module-based diagnostic test results.</td>
</tr>
<tr>
<td></td>
<td>show diagnostic result module</td>
<td>Displays the results of the bootup packet memory test.</td>
</tr>
<tr>
<td></td>
<td>test 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>show diagnostic result module</td>
<td>Displays the results from the ongoing packet memory test.</td>
</tr>
<tr>
<td></td>
<td>test 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>show diagnostic result module</td>
<td></td>
</tr>
</tbody>
</table>
show diagnostic result module

To display the module-based diagnostic test results, use the `show diagnostic result module` command.

```
show diagnostic result module [slot-num | all] [test [test-id | test-id-range | all]] [detail]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>slot-num</code></td>
<td>(Optional) Specifies the slot on which diagnostics are displayed.</td>
</tr>
<tr>
<td><code>all</code></td>
<td>(Optional) Displays the diagnostics for all slots.</td>
</tr>
<tr>
<td><code>test</code></td>
<td>(Optional) Displays selected tests on the specified module.</td>
</tr>
<tr>
<td><code>test-id</code></td>
<td>(Optional) Specifies a single test ID.</td>
</tr>
<tr>
<td><code>test-id-range</code></td>
<td>(Optional) Specifies a range of test IDs.</td>
</tr>
<tr>
<td><code>all</code></td>
<td>(Optional) Displays the diagnostics for all tests.</td>
</tr>
<tr>
<td><code>detail</code></td>
<td>(Optional) Displays the complete test results.</td>
</tr>
</tbody>
</table>

**Defaults**

A summary of the test results for all modules in the chassis is displayed.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(18)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the summary results for all modules in the chassis:

```
Switch# show diagnostic result module

Current bootup diagnostic level: minimal

module 1:

  Overall diagnostic result: PASS
  Diagnostic level at card bootup: bypass
  Test results: (. = Pass, F = Fail, U = Untested)
    1) supervisor-bootup -----------------------> U
    2) packet-memory-bootup -------------------> U
    3) packet-memory-ongoing -------------------> U

module 4:

  Overall diagnostic result: PASS
  Diagnostic level at card bootup: minimal
  Test results: (. = Pass, F = Fail, U = Untested)
    1) linecard-online-diag -------------------> .
```
module 5:

Overall diagnostic result: PASS
Diagnostic level at card bootup: minimal

Test results: (. = Pass, F = Fail, U = Untested)

1) linecard-online-diag ----------------------- > .

module 6:

Overall diagnostic result: PASS
Diagnostic level at card bootup: minimal

Test results: (. = Pass, F = Fail, U = Untested)

1) linecard-online-diag ----------------------- > .

This example shows how to display the online diagnostics for module 1:

Switch# show diagnostic result module 1 detail

Current bootup diagnostic level: minimal

module 1:

Overall diagnostic result: PASS
Diagnostic level at card bootup: minimal

Test results: (. = Pass, F = Fail, U = Untested)

1) supervisor-bootup ------------------------ > .

Error code ----------------------------- > 0 (DIAG_SUCCESS)
Total run count ------------------------ > 0
Last test execution time --------------- > n/a
First test failure time ---------------- > n/a
Last test failure time ------------------ > n/a
Last test pass time --------------------- > n/a
Total failure count --------------------- > 0
Consecutive failure count ------------- > 0

Power-On-Self-Test Results for ACTIVE Supervisor

Power-on-self-test for Module 1: WS-X4014
Port/Test Status: (. = Pass, F = Fail)
Reset Reason: PowerUp Software/User

Port Traffic: L2 Serdes Loopback ...
0: . 1: . 2: . 3: . 4: . 5: . 6: . 7: . 8: . 9: . 10: . 11: .

Port Traffic: L2 Asic Loopback ...
0: . 1: . 2: . 3: . 4: . 5: . 6: . 7: . 8: . 9: . 10: . 11: .
show diagnostic result module


Port Traffic: L3 Asic Loopback ...
0: . 1: . 2: . 3: . 4: . 5: . 6: . 7: . 8: . 9: . 10: . 11: .

Switch Subsystem Memory ...
1: . 2: . 3: . 4: . 5: . 6: . 7: . 8: . 9: . 10: . 11: . 12: .
49: . 50: . 51: . 52: . 53: . 54: .

Module 1 Passed

2) packet-memory-bootup ---------------------->

Error code ----------------------------- 0 (DIAG_SUCCESS)
Total run count ------------------------ 0
Last test execution time ---------------- n/a
First test failure time ----------------- n/a
Last test failure time ----------------- n/a
Last test pass time --------------------- n/a
Total failure count --------------------- 0
Consecutive failure count --------------- 0
packet buffers on free list: 64557 bad: 0 used for ongoing tests: 979

Number of errors found: 0
Cells with hard errors (failed two or more tests): 0
Cells with soft errors (failed one test, includes hard): 0
Suspect bad cells (uses a block that tested bad): 0
total buffers: 65536
bad buffers: 0 (0.0%)
good buffers: 65536 (100.0%)
Bootup test results:1
No errors.

3) packet-memory-ongoing ---------------------->

Error code ----------------------------- 0 (DIAG_SUCCESS)
Total run count ------------------------ 0
Last test execution time ---------------- n/a
First test failure time ----------------- n/a
Last test failure time ----------------- n/a
Last test pass time --------------------- n/a
Total failure count --------------------- 0
Consecutive failure count --------------- 0
packet buffers on free list: 64557 bad: 0 used for ongoing tests: 979

Packet memory errors: 0 0
Current alert level: green
Per 5 seconds in the last minute:
 0 0 0 0 0 0 0 0 0 0
 0 0
Per minute in the last hour:
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
Per hour in the last day:
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
Per day in the last 30 days:
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
Direct memory test failures per minute in the last hour:
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0
Potential false positives: 0 0
  Ignored because of rx errors: 0 0
  Ignored because of cdm fifo overrun: 0 0
  Ignored because of oir: 0 0
  Ignored because isl frames received: 0 0
  Ignored during boot: 0 0
  Ignored after writing hw stats: 0 0
  Ignored on high gigaport: 0
Ongoing diag action mode: Normal
Last 1000 Memory Test Failures:
Last 1000 Packet Memory errors:
First 1000 Packet Memory errors:

Switch#
show diagnostic result module test

To display the results of the bootup packet memory test, use the **show diagnostic result module test** command. The output indicates whether the test passed, failed, or was not run.

```
show diagnostic result module [N | all] [test test-id] [detail]
```

**Syntax Description**

- **N**  (Optional) Specifies the module number.
- **all**  (Optional) Specifies all modules.
- **test test-id**  (Optional) Specifies the number for the tdr test on the platform.
- **detail**  (Optional) Specifies the display of detailed information for analysis.

**Defaults**

Non-detailed results.

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The **detail** keyword is intended for use by Cisco support personnel when analyzing failures.

**Examples**

This example shows how to display the results of the bootup packet memory tests:

```
Switch# show diagnostic result module 6 detail
module 6:
Overall diagnostic result:PASS
Test results:(. = Pass, F = Fail, U = Untested)

1) linecard-online-diag --------------------------> .
   Error code ----------------------------------> 0 (DIAG_SUCCESS)
   Total run count --------------------------> 1
   Last test execution time ------------------> Jan 21 2001 19:48:30
   First test failure time ------------------> n/a
   Last test failure time ------------------> n/a
   Last test pass time ----------------------> Jan 21 2001 19:48:30
   Total failure count ----------------------> 0
   Consecutive failure count ----------------> 0
```
### Chapter 2  Cisco IOS Commands for the Catalyst 4500 Series Switches

#### show diagnostic result module test

<table>
<thead>
<tr>
<th>Slot</th>
<th>Ports</th>
<th>Card Type</th>
<th>Diag Status</th>
<th>Diag Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>48</td>
<td>10/100/1000BaseT (RJ45)V, Cisco/IEEE</td>
<td>Passed</td>
<td>None</td>
</tr>
</tbody>
</table>

**Detailed Status**

<table>
<thead>
<tr>
<th>. = Pass</th>
<th>U = Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>L = Loopback failure</td>
<td>S = Stub failure</td>
</tr>
<tr>
<td>I = Iic failure</td>
<td>P = Port failure</td>
</tr>
<tr>
<td>E = SEEPROM failure</td>
<td>G = GBIC integrity check failure</td>
</tr>
</tbody>
</table>

Ports 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Ports 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Ports 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

---

2) online-diag-tdr:

Port 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

. U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U

Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

. U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U

Error code --------------------------> 0 (DIAG_SUCCESS)

Total run count ----------------------> 1

Last test execution time ---------------> Jan 22 2001 03:01:54

First test failure time ----------------> n/a

Last test failure time ----------------> n/a

Last test pass time ------------------> Jan 22 2001 03:01:54

Total failure count -------------------> 0

Consecutive failure count ---------------> 0

**TDR test is in progress on interface Gi6/1**

---

**Switch#**

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>diagnostic start</td>
<td>Runs the specified diagnostic test.</td>
</tr>
</tbody>
</table>
show diagnostic result module test 2

To display the results of the bootup packet memory test, use the `show diagnostic result module test 2` command. The output indicates whether the test passed, failed, or was not run.

```
show diagnostic result module N test 2 [detail]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Specifies the module number.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Specifies the display of detailed information for analysis.</td>
</tr>
</tbody>
</table>

**Defaults**

Non-detailed results.

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(18)EW</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The `detail` keyword is intended for use by Cisco support personnel when analyzing failures.

**Examples**

This example shows how to display the results of the bootup packet memory tests:

```
Switch# show diagnostic result module 1 test 2
Test results: (. = Pass, F = Fail, U = Untested)
    2) packet-memory-bootup ----------> .
```

This example shows how to display detailed results from the bootup packet memory tests:

```
Switch# show diagnostic result module 2 test 2 detail
Test results: (. = Pass, F = Fail, U = Untested)
    2) packet-memory-bootup ----------> .
```

```
Error code ------------------> 0 (DIAG_SUCCESS)
Total run count --------------> 0
Last test execution time ----> n/a
First test failure time -------> n/a
Last test failure time -------> n/a
Last test pass time ----------> n/a
Total failure count ----------> 0
Consecutive failure count ---> 0
packet buffers on free list: 64557 bad: 0 used for ongoing tests: 979
```
show diagnostic result module test 2

Number of errors found: 0
Cells with hard errors (failed two or more tests): 0
Cells with soft errors (failed one test, includes hard): 0
Suspect bad cells (uses a block that tested bad): 0
total buffers: 65536
bad buffers: 0 (0.0%)
good buffers: 65536 (100.0%)
Bootup test results:
No errors.

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>diagnostic monitor action</td>
<td>Displays the results from the ongoing packet memory test.</td>
<td></td>
</tr>
<tr>
<td>show diagnostic result module test 3</td>
<td>Directs the action of the switch when it detects a packet memory failure.</td>
<td></td>
</tr>
</tbody>
</table>
show diagnostic result module test 3

To display the results from the ongoing packet memory test, use the `show diagnostic result module test 3` command. The output indicates whether the test passed, failed, or was not run.

```
show diagnostic result module N test 3 [detail]
```

### Syntax Description

- **N**: Module number.
- **detail** (Optional) Specifies the display of detailed information for analysis.

### Defaults

Non-detailed results.

### Command Modes

EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(18)EW</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

The `detail` keyword is intended for use by Cisco support personnel when analyzing failures.

### Examples

This example shows how to display the results from the ongoing packet memory tests:

```
Switch# show diagnostic result module 1 test 3
Test results: (. = Pass, F = Fail, U = Untested)
    3) packet-memory-ongoing ----------> .
```

This example shows how to display the detailed results from the ongoing packet memory tests:

```
Switch# show diagnostic result module 1 test 3 detail
Test results: (. = Pass, F = Fail, U = Untested)

    3) packet-memory-ongoing ----------> .

    Error code ------------------> 0 (DIAG_SUCCESS)
    Total run count --------------> 0
    Last test execution time ----> n/a
    First test failure time -----> n/a
    Last test failure time -------> n/a
    Last test pass time ---------> n/a
    Total failure count ---------> 0
    Consecutive failure count ---> 0
    packet buffers on free list: 64557 bad: 0 used for ongoing tests: 979
```
Packet memory errors: 0 0
Current alert level: green
Per 5 seconds in the last minute:
  0 0 0 0 0 0 0 0 0 0
  0 0
Per minute in the last hour:
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
Per hour in the last day:
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0
Per day in the last 30 days:
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
Direct memory test failures per minute in the last hour:
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
  0 0 0 0 0 0 0 0 0 0
Potential false positives: 0 0
  Ignored because of rx errors: 0 0
  Ignored because of cdm fifo overrun: 0 0
  Ignored because of cdm fifo overrun: 0 0
  Ignored because isl frames received: 0 0
  Ignored during boot: 0 0
  Ignored after writing hw stats: 0 0
  Ignored on high gigaport: 0
Ongoing diag action mode: Normal
Last 1000 Memory Test Failures: v
Last 1000 Packet Memory errors:
First 1000 Packet Memory errors:

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>diagnostic monitor action</strong></td>
<td>Directs the action of the switch when it detects a packet memory failure.</td>
<td></td>
</tr>
<tr>
<td><strong>show diagnostic result module test 2</strong></td>
<td>Displays the results of the bootup packet memory test.</td>
<td></td>
</tr>
</tbody>
</table>
show dot1x

To display the 802.1X statistics and operational status for the entire switch or for a specified interface, use the `show dot1x` command.

```
show dot1x [interface interface-id] | [statistics [interface interface-id]] | [all]
```

Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface interface-id</td>
<td>(Optional) Displays the 802.1X status for the specified port.</td>
</tr>
<tr>
<td>statistics</td>
<td>(Optional) Displays 802.1X statistics for the switch or the specified interface.</td>
</tr>
<tr>
<td>all</td>
<td>(Optional) Displays per-interface 802.1X configuration information for all interfaces with a nondefault 802.1X configuration.</td>
</tr>
</tbody>
</table>

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.1(12c)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>T2.1(19)EW</td>
<td>Display enhanced to show the guest-VLAN value.</td>
</tr>
<tr>
<td>T2.2(25)EW</td>
<td>Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>T2.2(25)EWA</td>
<td>Support for currently assigned reauthentication timer (if the timer is configured to honor the Session-Timeout value) was added.</td>
</tr>
<tr>
<td>T2.2(31)SG</td>
<td>Support for port direction control and critical recovery was added.</td>
</tr>
</tbody>
</table>

Usage Guidelines

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

If you enter the `statistics` keyword without the `interface` option, the statistics are displayed for all interfaces. If you enter the `statistics` keyword with the `interface` option, the statistics are displayed for the specified interface.

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

The `show dot1x` command displays the currently assigned reauthentication timer and time remaining before reauthentication, if reauthentication is enabled.
This example shows how to display the output from the `show dot1x` command:

```
Switch# show dot1x
Sysauthcontrol = Disabled
Dot1x Protocol Version = 2
Dot1x Oper Controlled Directions = Both
Dot1x Admin Controlled Directions = Both
Critical Recovery Delay = 500
Critical EAP = Enabled
Switch#
```

This example shows how to display the 802.1X statistics for a specific port:

```
Switch# show dot1x interface fastethernet6/1
Dot1x Info for FastEthernet6/1
-----------------------------------
PAE                       = AUTHENTICATOR
PortControl               = AUTO
ControlDirection          = Both
HostMode                  = MULTI_DOMAIN
ReAuthentication          = Disabled
QuietPeriod               = 60
ServerTimeout             = 30
SuppTimeout               = 30
ReAuthPeriod              = 3600 (Locally configured)
ReAuthMax                 = 2
MaxReq                    = 2
TxPeriod                  = 30
RateLimitPeriod           = 0

Dot1x Authenticator Client List
-------------------------------
Domain                    = DATA
Supplicant                = 0000.0000.ab01
  Auth SM State     = AUTHENTICATED
  Auth BEND SM Stat = IDLE
Port Status               = AUTHORIZED
Authentication Method     = Dot1x
Authorized By             = Authentication Server
Vlan Policy               = 12

Domain                    = VOICE
Supplicant                = 0060.b057.4687
  Auth SM State     = AUTHENTICATED
  Auth BEND SM Stat = IDLE
Port Status               = AUTHORIZED
Authentication Method     = Dot1x
Authorized By             = Authentication Server

Switch#
```

Table 2-24 provides a partial list of the displayed fields. The remaining fields in the display show internal state information. For a detailed description of these state machines and their settings, refer to the 802.1X specification.
This is an example of output from the `show dot1x statistics interface gigabitethernet1/1` command. Table 2-25 describes the fields in the display.

Switch# `show dot1x statistics interface gigabitethernet1/1`

<table>
<thead>
<tr>
<th>PortStatistics Parameters for Dot1x</th>
</tr>
</thead>
<tbody>
<tr>
<td>TxReqId = 0</td>
</tr>
<tr>
<td>RxStart = 0</td>
</tr>
<tr>
<td>RxInvalid = 0</td>
</tr>
<tr>
<td>RxVersion = 0</td>
</tr>
</tbody>
</table>

Switch#

<table>
<thead>
<tr>
<th>Table 2-25 show dot1x statistics Field Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field</td>
</tr>
<tr>
<td>TxReq/TxReqId</td>
</tr>
<tr>
<td>TxTotal</td>
</tr>
<tr>
<td>RxStart</td>
</tr>
<tr>
<td>RxLogoff</td>
</tr>
<tr>
<td>RxRespId</td>
</tr>
<tr>
<td>RxResp</td>
</tr>
<tr>
<td>RxInvalid</td>
</tr>
<tr>
<td>RxLenError</td>
</tr>
<tr>
<td>RxTotal</td>
</tr>
<tr>
<td>RxVersion</td>
</tr>
<tr>
<td>LastRxSrcMac</td>
</tr>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dot1x critical</td>
<td>Enables the 802.1X critical authentication on a port.</td>
</tr>
<tr>
<td>dot1x critical eapol</td>
<td>Enables sending EAPOL success packets when a port is critically authorized partway through an EAP exchange.</td>
</tr>
<tr>
<td>dot1x critical recovery delay</td>
<td>Sets the time interval between port reinitializations.</td>
</tr>
<tr>
<td>dot1x critical vlan</td>
<td>Assigns a critically authenticated port to a specific VLAN.</td>
</tr>
<tr>
<td>dot1x guest-vlan</td>
<td>Enables a guest VLAN on a per-port basis.</td>
</tr>
<tr>
<td>dot1x max-reauth-req</td>
<td>Sets the maximum number of times that the switch will retransmit an EAP-Request/Identity frame to the client before restarting the authentication process.</td>
</tr>
<tr>
<td>dot1x port-control</td>
<td>Enables manual control of the authorization state on a port.</td>
</tr>
<tr>
<td>mac-address-table notification</td>
<td>Enables MAC address notification on a switch.</td>
</tr>
</tbody>
</table>
**show energywise**

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

```
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>categories</td>
<td>(Optional) Displays the power levels.</td>
</tr>
<tr>
<td>children</td>
<td>(Optional) Displays the status of the entity and the PoE ports.</td>
</tr>
<tr>
<td>domain</td>
<td>(Optional) Displays the domain to which the entity belongs.</td>
</tr>
<tr>
<td>events</td>
<td>(Optional) Displays the last ten events (messages) sent to other entities in the domain.</td>
</tr>
<tr>
<td>level children</td>
<td>(Optional) Displays the available power level for the entity.</td>
</tr>
<tr>
<td>current children</td>
<td>- children—Available power levels for the entity and the PoE ports.</td>
</tr>
<tr>
<td>delta children</td>
<td>- current—Current power level for the entity. (Optional) children—Current power levels for the entity and the PoE ports.</td>
</tr>
<tr>
<td>neighbors</td>
<td>(Optional) Displays the neighbor tables for the domains to which the entity belongs.</td>
</tr>
<tr>
<td>recurrences</td>
<td>(Optional) Displays the EnergyWise settings and status for recurrence.</td>
</tr>
<tr>
<td>statistics</td>
<td>(Optional) Displays the counters for events and errors.</td>
</tr>
<tr>
<td>usage children</td>
<td>(Optional) Displays the power for the entity.</td>
</tr>
<tr>
<td>version</td>
<td>(Optional) Displays the current power levels for the entity and the PoE ports.</td>
</tr>
<tr>
<td>version</td>
<td>(Optional) Displays the EnergyWise version.</td>
</tr>
<tr>
<td>version</td>
<td>Children</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(52)SG</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.
## show energywise

### Examples

**Switch# show energywise**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Role</th>
<th>Name</th>
<th>Usage</th>
<th>Lvl</th>
<th>Imp</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch</td>
<td>lobby.1</td>
<td></td>
<td>558.0 (W)</td>
<td>10</td>
<td>1</td>
<td>parent</td>
</tr>
</tbody>
</table>

**Switch# show energywise children**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Role</th>
<th>Name</th>
<th>Usage</th>
<th>Lvl</th>
<th>Imp</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch</td>
<td>lobby.1</td>
<td></td>
<td>558.0 (W)</td>
<td>10</td>
<td>1</td>
<td>parent</td>
</tr>
<tr>
<td>Gi1/3</td>
<td>interface</td>
<td>Gi1.3</td>
<td>0.0 (W)</td>
<td>10</td>
<td>1</td>
<td>child</td>
</tr>
<tr>
<td>Gi1/4</td>
<td>interface</td>
<td>Gi1.4</td>
<td>0.0 (W)</td>
<td>10</td>
<td>1</td>
<td>child</td>
</tr>
</tbody>
</table>

<output truncated>

**Switch# show energywise domain**

Name : lobby.1  
Domain : area1  
Protocol : udp  
IP : 10.10.10.2  
Port : 43440

**Switch# show energywise events**

Sequence: 246818  References: 0:1  Errors:  
Class: PN_CLASS_QUERY  
Action: PN_ACTION_CPQR POWERNET_QUERY_SET  
Reply To: 8.8.8.24:434440

Sequence: 246827  References: 0:1  Errors:  
Class: PN_CLASS_DISCOVERY  
Action: PN_ACTION_CPQR POWERNET_DISCOVERY_DISCOVERY_UPDATE  
Reply To: 8.8.8.24:434440

**Switch# show energywise level**

Levels (Watts)

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</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>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>lobby.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
</tbody>
</table>

**Switch# show energywise level children**

Levels (Watts)

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</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>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>lobby.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
<tr>
<td>Gi1/0/1</td>
<td>Gi1.0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
<tr>
<td>Gi1/0/2</td>
<td>Gi1.0.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
<tr>
<td>Gi1/0/3</td>
<td>Gi1.0.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
<tr>
<td>Gi1/0/4</td>
<td>Gi1.0.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
<tr>
<td>Gi1/0/5</td>
<td>Gi1.0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
<tr>
<td>Gi1/0/1</td>
<td>Gi1.0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>558.0</td>
</tr>
</tbody>
</table>

<output truncated>

**Switch# show energywise level current**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</th>
<th>Level</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>lobby.1</td>
<td></td>
<td>10</td>
<td>558.0 (W)</td>
</tr>
</tbody>
</table>

**Switch# show energywise level current children**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</th>
<th>Level</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>lobby.1</td>
<td></td>
<td>10</td>
<td>558.0 (W)</td>
</tr>
<tr>
<td>Gi1/0/1</td>
<td>Gi1.0.1</td>
<td>1</td>
<td>15.4 (W)</td>
</tr>
</tbody>
</table>
### Chapter 2: Cisco IOS Commands for the Catalyst 4500 Series Switches

#### show energywise

```
Switch# show energywise

Gi1/0/2   Gi1.0.2   1  15.4 (W)
Gi1/0/3   Gi1.0.3   1  15.4 (W)
Gi1/0/4   Gi1.0.4   1  15.4 (W)
Gi1/0/5   Gi1.0.5   1  15.4 (W)
```

#### show energywise level delta

```
Switch# show energywise level delta

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</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>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>lobby.1</td>
<td></td>
<td>-558.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>
```

#### show energywise level delta child

```
Switch# show energywise level delta child

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</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>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>lobby.1</td>
<td></td>
<td>-558.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Gi1/0/1</td>
<td>Gi1.0.1</td>
<td></td>
<td>0.0</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>Gi1/0/2</td>
<td>Gi1.0.2</td>
<td></td>
<td>0.0</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>Gi1/0/3</td>
<td>Gi1.0.3</td>
<td></td>
<td>0.0</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>Gi1/0/4</td>
<td>Gi1.0.4</td>
<td></td>
<td>0.0</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td></td>
</tr>
</tbody>
</table>
```

#### show energywise neighbors

```
Switch# show energywise neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone

<table>
<thead>
<tr>
<th>Id</th>
<th>Neighbor Name</th>
<th>Ip:Port</th>
<th>Prot</th>
<th>Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switch.A</td>
<td>2.2.2.29:43440</td>
<td>cdp</td>
<td>S I</td>
</tr>
<tr>
<td>5</td>
<td>Switch.B</td>
<td>2.2.2.22:43440</td>
<td>udp</td>
<td>S I</td>
</tr>
<tr>
<td>7</td>
<td>Switch.C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

#### show energywise recurrences

```
Switch# show energywise recurrences

<table>
<thead>
<tr>
<th>Id</th>
<th>Addr</th>
<th>Class Action Lvl</th>
<th>Cron</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Gi1/0/17</td>
<td>QUERY SET</td>
<td>3 minutes: 0 hour: 8 day: * month: * weekday: *</td>
</tr>
<tr>
<td>3</td>
<td>Gi1/0/18</td>
<td>QUERY SET</td>
<td>3 minutes: 0 hour: 8 day: * month: * weekday: *</td>
</tr>
<tr>
<td>4</td>
<td>Gi1/0/19</td>
<td>QUERY SET</td>
<td>3 minutes: 0 hour: 8 day: * month: * weekday: *</td>
</tr>
</tbody>
</table>
```

#### show energywise statistics

```
Switch# show energywise statistics

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

#### show energywise usage

```
Switch# show energywise usage

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</th>
<th>Usage</th>
<th>Caliber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>558.0 (W)</td>
<td>max</td>
</tr>
</tbody>
</table>
```

#### show energywise usage child

```
Switch# show energywise usage child

<table>
<thead>
<tr>
<th>Interface</th>
<th>Name</th>
<th>Usage</th>
<th>Caliber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>558.0 (W)</td>
<td>max</td>
</tr>
<tr>
<td>Gi1/0/1</td>
<td>Gi1.0.1</td>
<td>0.0 (W)</td>
<td>presumed</td>
</tr>
<tr>
<td>Gi1/0/2</td>
<td>Gi1.0.2</td>
<td>0.0 (W)</td>
<td>presumed</td>
</tr>
<tr>
<td>Gi1/0/3</td>
<td>Gi1.0.3</td>
<td>0.0 (W)</td>
<td>presumed</td>
</tr>
<tr>
<td>Gi1/0/4</td>
<td>Gi1.0.4</td>
<td>0.0 (W)</td>
<td>presumed</td>
</tr>
<tr>
<td>Gi1/0/5</td>
<td>Gi1.0.5</td>
<td>0.0 (W)</td>
<td>presumed</td>
</tr>
</tbody>
</table>
```

<output truncated>
Switch# `show energywise version`
EnergyWise is Enabled
IOS Version: 12.2(52)SG(0.91)
EnergyWise Specification: (t_nrgyiz_v122_52_sg_throttle)1.0.14

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>energywise (global configuration)</code></td>
<td>Enables and configures EnergyWise on the entity.</td>
</tr>
<tr>
<td><code>energywise (interface configuration)</code></td>
<td>Configures EnergyWise on the PoE port.</td>
</tr>
</tbody>
</table>
show environment

To display the environment alarm, operational status, and current reading for the chassis, use the show environment command.

`show environment [alarm] [status [chassis | fantray | powersupply | supervisor]] [temperature]`

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>alarm</td>
<td>(Optional) Specifies the alarm status of the chassis.</td>
</tr>
<tr>
<td>status</td>
<td>(Optional) Specifies the operational status information.</td>
</tr>
<tr>
<td>chassis</td>
<td>(Optional) Specifies the operational status of the chassis.</td>
</tr>
<tr>
<td>fantray</td>
<td>(Optional) Specifies the status of the fan tray, and shows fan tray power consumption.</td>
</tr>
<tr>
<td>powersupply</td>
<td>(Optional) Specifies the status of the power supply.</td>
</tr>
<tr>
<td>supervisor</td>
<td>(Optional) Specifies the status of the supervisor engine.</td>
</tr>
<tr>
<td>temperature</td>
<td>(Optional) Specifies the current chassis temperature readings.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Support for the ability to display generic environment information with the show environment command was added.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display information about the environment alarms, operational status, and current temperature readings for the chassis:

```
Switch# show environment
no alarm
Chassis Temperature = 32 degrees Celsius
Chassis Over Temperature Threshold = 75 degrees Celsius
Chassis Critical Temperature Threshold = 95 degrees Celsius

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Model No</th>
<th>Type</th>
<th>Fan Status</th>
<th>Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1</td>
<td>PWR-C45-1400AC</td>
<td>AC 1400W</td>
<td>good</td>
<td>good</td>
</tr>
<tr>
<td>PS2</td>
<td>none</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Power Supply (Nos in Watts) Max Inline Min Inline Max System Min System Absolute Maximum
| PS1 | 0 | 0 | 1360 | 1360 | 1400 |
| PS2 | -- | -- | -- | -- | -- |
```
Power supplies needed by system : 1

Chassis Type : WS-C4507R

Supervisor Led Color : Green

Fantray : good

Fantray removal timeout: 240

Power consumed by Fantray : 50 Watts

This example shows how to display information about the environment alarms:

Switch# show environment alarm
no alarm
Switch#

This example shows how to display information about the power supplies, chassis type, and fan trays:

Switch# show environment status

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Model No</th>
<th>Type</th>
<th>Status</th>
<th>Fan Type</th>
<th>Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1</td>
<td>PWR-C45-1400AC</td>
<td>AC 1400W</td>
<td>good</td>
<td>good</td>
<td>good</td>
</tr>
<tr>
<td>PS2</td>
<td>none</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Power Supply (Nos in Watts) Inline Inline System System Maximum
-------------- ------ ------ ------- ------- --------
PS1                0       0    1360    1360    1400
PS2               --      --      --      --     --

Power supplies needed by system : 1

Chassis Type : WS-C4507R

Supervisor Led Color : Green

Fantray : good

Power consumed by Fantray : 50 Watts

Switch#

This example shows how to display information about the chassis:

Switch# show environment status chassis
Chassis Type :WS-C4507R
Switch#

This example shows how to display information about the fan tray:

Switch# show environment status fantray
Fantray : good
Power consumed by Fantray : 50 Watts
Switch#
This example shows how to display information about the power supply:

```
Switch# show environment status powersupply
Power Supply Model No Type Status Sensor
-------- ----------- ------- ------ ------
PS1 WS-X4008 AC 400W good good
PS2 WS-X4008 AC 400W good good
PS3 none -- -- --
Switch#
```

This example shows how to display information about the supervisor engine:

```
Switch# show environment status supervisor
Supervisor Led Color : Green
Switch#
```

This example shows how to display information about the temperature of the chassis:

```
Switch# show environment temperature
Chassis Temperature = 32 degrees Celsius
Chassis Over Temperature Threshold = 75 degrees Celsius
Chassis Critical Temperature Threshold = 95 degrees Celsius
Switch#
```
show errdisable detect

To display the error disable detection status, use the **show errdisable detect** command.

```
show errdisable detect
```

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

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Display includes the status of storm control.</td>
</tr>
</tbody>
</table>

**Examples**
This example shows how to display the error disable detection status:

```
Switch# show errdisable detect
ErrDisable Reason  Detection status
-----------------    ----------------
udld              Enabled
bpduguard         Enabled
security-violatio Enabled
channel-misconfig Disabled
psecure-violation Enabled
vmps              Enabled
pagp-flap          Enabled
dtp-flap           Enabled
link-flap          Enabled
l2ptguard         Enabled
gbic-invalid      Enabled
dhcp-rate-limit    Enabled
unicast-flood     Enabled
storm-control     Enabled
ilpower           Enabled
arp-inspection    Enabled
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>errdisable detect</td>
<td>Enables error-disable detection.</td>
</tr>
<tr>
<td>errdisable recovery</td>
<td>Configures the recovery mechanism variables.</td>
</tr>
<tr>
<td>show interfaces status</td>
<td>Displays the interface status or a list of interfaces in error-disabled state.</td>
</tr>
</tbody>
</table>
show errdisable recovery

To display error disable recovery timer information, use the `show errdisable recovery` command.

```
show errdisable recovery
```

**Syntax Description**

This command has no arguments or keywords.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Display includes the status of storm control.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display recovery timer information for error disable:

```
Switch# show errdisable recovery
ErrDisable Reason Timer Status
----------------- ---------------
udld              Disabled
bpduguard        Disabled
security-violatio Disabled
channel-misconfig Disabled
vmps             Disabled
pagp-flap        Disabled
dtp-flap         Disabled
link-flap        Disabled
12ptguard        Disabled
psecure-violation Disabled
gbic-invalid     Disabled
dhcp-rate-limit  Disabled
unicast-flood    Disabled
storm-control    Disabled
arp-inspection   Disabled

Timer interval: 30 seconds

Interfaces that will be enabled at the next timeout:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Errdisable reason</th>
<th>Time left(sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa7/32</td>
<td>arp-inspect</td>
<td>13</td>
</tr>
</tbody>
</table>
```

**Related Commands**

- `show errdisable recovery`
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>errdisable detect</td>
<td>Enables error-disable detection.</td>
</tr>
<tr>
<td>errdisable recovery</td>
<td>Configures the recovery mechanism variables.</td>
</tr>
<tr>
<td>show interfaces status</td>
<td>Displays the interface status or a list of interfaces in error-disabled state.</td>
</tr>
</tbody>
</table>
show etherchannel

To display EtherChannel information for a channel, use the `show etherchannel` command.

```
show etherchannel [channel-group] [port-channel | brief | detail | summary | port | load-balance | protocol]
```

**Syntax Description**

- **channel-group**: (Optional) Number of the channel group; valid values are from 1 to 64.
- **port-channel**: Displays port-channel information.
- **brief**: Displays a summary of EtherChannel information.
- **detail**: Displays detailed EtherChannel information.
- **summary**: Displays a one-line summary per channel group.
- **port**: Displays EtherChannel port information.
- **load-balance**: Displays load-balance information.
- **protocol**: Displays the enabled protocol.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>T2.1(13)EW</td>
<td>Support for LACP was added to this command.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

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

**Examples**

This example shows how to display port-channel information for a specific group:

```
Switch# show etherchannel 1 port-channel
Port-channels in the group:
--------------------------
Port-channel: Po1
-------------
Age of the Port-channel   = 02h:35m:26s
Logical slot/port   = 10/1 Number of ports in agport = 0
GC                     = 0x00000000  HotStandBy port = null
Passive port list   = Fa5/4 Fa5/5
Port state            = Port-channel L3-Ag Ag-Not-Inuse
```
show etherchannel

Ports in the Port-channel:
Index  Load  Port
-------------------
Switch#

This example shows how to display load-balancing information:

Switch# show etherchannel load-balance
Source XOR Destination mac address
Switch#

This example shows how to display a summary of information for a specific group:

Switch# show etherchannel 1 brief
Group state = L3
Ports: 2  Maxports = 8
port-channels: 1 Max port-channels = 1
Switch#

This example shows how to display detailed information for a specific group:

Switch# show etherchannel 1 detail
Group state = L3
Ports: 2  Maxports = 8
Port-channels: 1 Max Port-channels = 1
Port: Fa5/4
-------------------
Port state = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1  Mode = Desirable  Gcchange = 0
Port-channel = null  GC = 0x00000000  Pseudo-agport = Po1
Port indx = 0  Load = 0x00

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.
Timers: H - Hello timer is running.    Q - Quit timer is running.
S - Switching timer is running.    I - Interface timer is running.

Local information:
Hello    Partner  PAgP     Learning  Group
Port      Flags State   Timers  Interval Count   Priority   Method  Ifindex
Fa5/4     d     U1/S1           1s       0        128        Any      0

Age of the port in the current state: 02h:33m:14s
Port: Fa5/5
-------------------
Port state = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1  Mode = Desirable  Gcchange = 0
Port-channel = null  GC = 0x00000000  Pseudo-agport = Po1
Port indx = 0  Load = 0x00

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.
Timers: H - Hello timer is running.    Q - Quit timer is running.
S - Switching timer is running.    I - Interface timer is running.

Local information:
show etherchannel

Age of the port in the current state: 02h:33m:17s
Port-channels in the group:

Port-channel: Po1
-------------
Age of the Port-channel = 02h:33m:52s
Logical slot/port = 10/1
GC = 0x00000000
Passive port list = Fa5/4 Fa5/5
Port state = Port-channel L3-Ag Ag-Not-Inuse

Ports in the Port-channel:

Index Load Port
--------------
Switch#

This example shows how to display a one-line summary per channel group:

Switch# show etherchannel summary
Flags:  D - down         P - bundled in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3     S - Layer2
        U - in use      f - failed to allocate aggregator
        M - not in use, minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

Number of channel-groups in use: 2
Number of aggregators: 2

Group  Port-channel  Protocol  Ports
-----  -----------  --------  ---------------
1      Po1(SD)      LACP     Gi1/23(H)   Gi1/24(H)
Switch#

This example shows how to display EtherChannel port information for all ports and all groups:

Switch# show etherchannel port
Channel-group listing:
----------------------

Group: 1
--------

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

Port: Fa5/4
----------

Port state = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1
Mode = Desirable
Gcchange = 0
Port-channel = null
Psudo-agport = Po1
Port indx = 0
Load = 0x00

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.
        T - Hello timer is running.     Q - Quit timer is running.
        S - Switching timer is running. I - Interface timer is running.

Local information:
Hello  Partner  PAgP  Learning  Group
### show etherchannel

<table>
<thead>
<tr>
<th>Port</th>
<th>Flags</th>
<th>State</th>
<th>Timers</th>
<th>Interval</th>
<th>Count</th>
<th>Priority</th>
<th>Method</th>
<th>Ifindex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa5/4</td>
<td>d</td>
<td>U1/S1</td>
<td>1s</td>
<td>0</td>
<td>128</td>
<td>Any</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Age of the port in the current state: 02h:40m:35s
Port: Fa5/5

- Port state = EC-Enbld Down Not-in-Bndl Usr-Config
- Channel group = 1 Mode = Desirable Gcchange = 0
- Port-channel = null GC = 0x00000000 Pseudo-agport = Po1
- Port indx = 0 Load = 0x00

**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.

**Timers:**
- H - Hello timer is running.
- Q - Quit timer is running.
- S - Switching timer is running.
- I - Interface timer is running.

This example shows how to display the protocol enabled:

```bash
Switch# show etherchannel protocol
Channel-group listing:

Group: 12
--------
Protocol: PAgP

Group: 24
--------
Protocol: - (Mode ON)
```

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>channel-group</td>
<td>Assigns and configures an EtherChannel interface to an EtherChannel group.</td>
</tr>
<tr>
<td></td>
<td>interface port-channel</td>
<td>Accesses or creates a port-channel interface.</td>
</tr>
</tbody>
</table>
show flowcontrol

To display the per-interface status and statistics related to flow control, use the show flowcontrol command.

```
show flowcontrol [module slot | interface interface]
```

**Syntax Description**

- **module slot** (Optional) Limits the display to interfaces on a specific module.
- **interface interface** (Optional) Displays the status on a specific interface.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Table 2-26 describes the fields in the show flowcontrol command output.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
<td>Module and port number.</td>
</tr>
<tr>
<td>Send-Flowcontrol-Admin</td>
<td>Flow-control administration. Possible settings: on indicates the local port sends flow control to the far end; off indicates the local port does not send flow control to the far end; desired indicates the local end sends flow control to the far end if the far end supports it.</td>
</tr>
<tr>
<td>Send-Flowcontrol-Oper</td>
<td>Flow-control operation. Possible setting: disagree indicates the two ports could not agree on a link protocol.</td>
</tr>
<tr>
<td>Receive-Flowcontrol-Admin</td>
<td>Flow-control administration. Possible settings: on indicates the local port requires the far end to send flow control; off indicates the local port does not allow the far end to send flow control; desired indicates the local end allows the far end to send flow control.</td>
</tr>
<tr>
<td>Receive-Flowcontrol-Oper</td>
<td>Flow-control operation. Possible setting: disagree indicates the two ports could not agree on a link protocol.</td>
</tr>
<tr>
<td>RxPause</td>
<td>Number of pause frames received.</td>
</tr>
<tr>
<td>TxPause</td>
<td>Number of pause frames transmitted.</td>
</tr>
</tbody>
</table>
This example shows how to display the flow control status on all the Gigabit Ethernet interfaces:

Switch# show flowcontrol

<table>
<thead>
<tr>
<th>Port</th>
<th>Send FlowControl</th>
<th>Receive FlowControl</th>
<th>RxPause</th>
<th>TxPause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>admin</td>
<td>oper</td>
<td>admin</td>
<td>oper</td>
</tr>
<tr>
<td>Tel/1</td>
<td>off</td>
<td>off</td>
<td>on</td>
<td>off</td>
</tr>
<tr>
<td>Tel/2</td>
<td>off</td>
<td>off</td>
<td>on</td>
<td>off</td>
</tr>
<tr>
<td>Gi1/3</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>on</td>
</tr>
<tr>
<td>Gi1/4</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>on</td>
</tr>
<tr>
<td>Gi1/5</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>on</td>
</tr>
<tr>
<td>Gi1/6</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>on</td>
</tr>
<tr>
<td>Gi1/7</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>off</td>
</tr>
<tr>
<td>Gi1/8</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>off</td>
</tr>
<tr>
<td>Gi1/9</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>off</td>
</tr>
<tr>
<td>Gi1/10</td>
<td>off</td>
<td>off</td>
<td>desired</td>
<td>off</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the flow control status on module 1:

Switch# show flowcontrol module 1

<table>
<thead>
<tr>
<th>Port</th>
<th>Send FlowControl</th>
<th>Receive FlowControl</th>
<th>RxPause</th>
<th>TxPause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>admin</td>
<td>oper</td>
<td>admin</td>
<td>oper</td>
</tr>
<tr>
<td>Gi1/1</td>
<td>desired</td>
<td>off</td>
<td>off</td>
<td>on</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>on</td>
<td>disagree</td>
<td>on</td>
<td>on</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the flow control status on Gigabit Ethernet interface 3/4:

Switch# show flowcontrol interface gigabitethernet3/4

<table>
<thead>
<tr>
<th>Port</th>
<th>Send FlowControl</th>
<th>Receive FlowControl</th>
<th>RxPause</th>
<th>TxPause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>admin</td>
<td>oper</td>
<td>admin</td>
<td>oper</td>
</tr>
<tr>
<td>Gi3/4</td>
<td>off</td>
<td>off</td>
<td>on</td>
<td>on</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the flow control status on 10-Gigabit Ethernet interface 1/1:

Switch# show flowcontrol interface tengigabitethernet1/1

<table>
<thead>
<tr>
<th>Port</th>
<th>Send FlowControl</th>
<th>Receive FlowControl</th>
<th>RxPause</th>
<th>TxPause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>admin</td>
<td>oper</td>
<td>admin</td>
<td>oper</td>
</tr>
<tr>
<td>Tel/1</td>
<td>off</td>
<td>off</td>
<td>on</td>
<td>off</td>
</tr>
</tbody>
</table>

Switch#

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>channel-group</td>
<td>Configures a Gigabit Ethernet interface to send or receive pause frames.</td>
</tr>
<tr>
<td>show interfaces status</td>
<td>Displays the interface status or a list of interfaces in error-disabled state.</td>
</tr>
</tbody>
</table>
show hw-module port-group

To display how the X2 holes on a module are grouped, use the show hw-module port-group command.

```
show hw-module module number port-group
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>module</td>
<td>Specifies a line module.</td>
</tr>
<tr>
<td>number</td>
<td>Specifies a slot or module number.</td>
</tr>
<tr>
<td>port-group</td>
<td>Specifies a port-group on a switch.</td>
</tr>
</tbody>
</table>

**Defaults**

X2 mode.

**Command Modes**

Global configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(40)SG</td>
<td>Support for WS-X4606-10GE-E Twin Gigabit converter introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

When a TwinGig converter is enabled or disabled, the number and type of ports on the line card change dynamically. The terminology must reflect this behavior. In Cisco IOS, 10-Gigabit ports are named TenGigabit and 1-Gigabit ports are named Gigabit. Starting with Cisco IOS Release 12.2(40)SG, to avoid having ports named TenGigabit1/1 and Gigabit1/1, the 10-Gigabit and 1-Gigabit port numbers are independent. The WS-X4606-10GE-E module with six X2 ports are named TenGigabit<slot-num>/<1-6>, and the SFP ports are named Gigabit<slot-num>/<7-18>.

In the Supervisor Engine 6-E and Catalyst 4900M chassis, the ports are connected to the switching engine through a stub ASIC. This stub ASIC imposes some limitations on the ports: Gigabit and 10-Gigabit ports cannot be mixed on a single stub ASIC; they must either be all 10-Gigabit (X2), or all Gigabit (TwinGig converter and SFP). The faceplates of X2 modules show this stub-port grouping, either with an actual physical grouping, or a box drawn around a grouping.

**Examples**

This example shows to determine how the X2 holes on a module are grouped on a WS-X4606-10GE-E:

```
Switch# show hw-module module 1 port-group
Module  Port-group  Active  Inactive
        -----------  -------  -------
1        1         Tel/1-3   Gi1/7-12
1        2         Tel/4-6   Gi1/13-18
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>hw-module port-group</td>
<td>Selects either Gigabit Ethernet or Ten Gigabit Ethernet interfaces on your module.</td>
</tr>
</tbody>
</table>
show hw-module uplink

To display the current uplink mode, use the `show hw-module uplink` command.

```
show hw-module uplink
```

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
If the active uplink mode is different than configured mode, the output displays the change.

By default, the current (operational) uplink selection is displayed.

**Examples**

This example shows the output displaying the current (active) uplinks:

```
Switch# show hw-module uplink
Active uplink configuration is TenGigabitEthernet
```

This example shows the output for redundant systems in SSO mode if the 10-Gigabit Ethernet uplinks are active, and the Gigabit Ethernet uplinks are selected:

```
Switch# show hw-module uplink
Active uplink configuration is TenGigabitEthernet
(will be GigabitEthernet after next reload)
A 'redundancy reload shelf' or power-cycle of chassis is required to apply the new configuration
```

This example shows the output for redundant systems in RPR mode if the 10-Gigabit Ethernet uplinks are active, and the Gigabit Ethernet uplinks are selected:

```
Switch# show hw-module uplink
Active uplink configuration is TenGigabitEthernet
(will be GigabitEthernet after next reload)
A reload of active supervisor is required to apply the new configuration.
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>hw-module uplink select</td>
<td>Selects the 10-Gigabit Ethernet or Gigabit Ethernet uplinks on the Supervisor Engine V-10GE within the W-C4510R chassis.</td>
</tr>
</tbody>
</table>
show idprom

To display the IDPROMs for the chassis, supervisor engine, module, power supplies, fan trays, clock module, and multiplexer (mux) buffer, use the show idprom command.

```
show idprom { all | chassis | module [mod] | interface int_name | supervisor | power-supply number | fan-tray }
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Displays information for all IDPROMs.</td>
</tr>
<tr>
<td>chassis</td>
<td>Displays information for the chassis IDPROMs.</td>
</tr>
<tr>
<td>module</td>
<td>Displays information for the module IDPROMs.</td>
</tr>
<tr>
<td>mod</td>
<td>(Optional) Specifies the module name.</td>
</tr>
<tr>
<td>interface int_name</td>
<td>Displays information for the GBIC or SFP IDPROMs.</td>
</tr>
<tr>
<td>supervisor</td>
<td>Displays information for the supervisor engine IDPROMs.</td>
</tr>
<tr>
<td>power-supply number</td>
<td>Displays information for the power supply IDPROMs.</td>
</tr>
<tr>
<td>fan-tray</td>
<td>Displays information for the fan tray IDPROMs.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Support for the power-supply, fan-tray, clock-module, and mux-buffer keywords was added.</td>
</tr>
<tr>
<td>12.1(13)EW</td>
<td>Support for interface keyword was added.</td>
</tr>
<tr>
<td>12.2(18)EW</td>
<td>Enhanced the show idprom interface output to include the hexadecimal display of the GBIC/SFP SEEPROM contents.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

When you enter the show idprom interface command, the output lines for Calibration type and Rx (receive) power measurement may not be displayed for all GBICs.
### Examples

This example shows how to display IDPROM information for module 4:

```
Switch# show idprom module 4
Module 4 Idprom:
Common Block Signature = 0xABAB
Common Block Version = 1
Common Block Length = 144
Common Block Checksum = 4199
Idprom Size = 256
Block Count = 2
FRU Major Type = 0x4201
FRU Minor Type = 303
OEM String = Cisco Systems, Inc.
Product Number = WS-X4306
Serial Number = 00000135
Part Number = <tbd>
Hardware Revision = 0.2
Manufacturing Bits = 0x0000
Snmp OID = 0.0.0.0.0.0.0.0.0
Power Consumption = 0
RMA Failure Code = 0 0 0 0
Linecard Block Signature = 0x4201
Linecard Block Version = 1
Linecard Block Length = 24
Linecard Block Checksum = 658
Feature Bits = 0x0000000000000000
Card Feature Index = 50
MAC Base = 0010.7bab.9830
MAC Count = 6
Switch#
```

This example shows how to display IDPROM information for the GBICs on the Gigabit Ethernet interface 1/2:

```
Switch# show idprom interface gigabitethernet1/2
GBIC Serial EEPROM Contents:
Common Block:
Identifier = GBIC [0x1]
Extended Id = Not specified/compliant with defined MOD_DEF [0x0]
Connector = SC connector [0x1]
Transceiver
Speed = Not available [0x0]
Media = Not available [0x0]
Technology = Not available [0x0]
Link Length = Not available [0x0]
GE Comp Codes = Not available [0x0]
SONET Comp Codes = Not available [0x0]
Encoding = 8B10B [0x1]
BR, Nominal = 1300000000 MHz
Length(9u) in km = GBIC does not support single mode fibre, or the length must be determined from the transceiver technology.
Length(9u) = > 25.4 km
Length(50u) = GBIC does not support 50 micron multi-mode fibre, or the length must be determined from the transceiver technology.
Length(62.5u) = GBIC does not support 62.5 micron multi-mode fibre, or the length must be determined from transceiver technology.
Length(Copper) = GBIC does not support copper cables, or the length must be determined from the transceiver technology.
Vendor name = CISCO-FINISAR
Vendor OUI = 36965
Vendor Part No. = FTR-0119-CSC
Vendor Part Rev. = B
Wavelength = Not available
```
CC_BASE = 0x1A

Extended ID Fields
Options = Loss of Signal implemented TX_FAULT signal implemented TX_DISABLE is implemented and disables the serial output [0x1A]
BR, max = Unspecified
BR, min = Unspecified
Vendor Serial No. = K1273DH
Date code = 030409
Dial monitoring = Implemented
Calibration type = Internal
Rx pwr measurement = Optical Modulation Amplitude (OMA)
Address change = Required
CC_EXT = 0xB2

Vendor Specific ID Fields:
20944D30 29 00 02 80 22 33 38 3D C7 67 83 E8 DF 65 6A AF }....'38=Gg^Ch_ej/
20944D40 1A 80 ED 00 00 00 00 00 00 00 00 00 00 38 23 3C 1B ............#<.

SEEPROM contents (hex) size 128:
0x0000 01 00 01 00 00 00 00 00 00 00 00 00 00 00 00 FF  ............
0x0010 00 00 00 00 43 49 53 43 4F 2D 46 49 4E 49 53 41  ..^PeFTR-0119
0x0030 2D 43 53 43 20 20 20 00 00 90 65 46 54 20 00 00 1A -CSC  B ....
0x0040 01 0A 00 00 4B 31 32 33 38 3D C7 67 83 E8 DF 65 6A AF ..^"38=Gg^C._ej.
0x0050 00 1A 00 00 00 00 00 00 1A 00 00 00 38 23 3C 1B 0m...........#<.

Switch#

This example shows how to display IDPROM information for the 10-Gigabit Ethernet interface 1/1:

Switch# show idprom interface tengigabitethernet1/1
X2 Serial EEPROM Contents:
Non-Volatile Register (NVR) Fields
X2 MSA Version supported :0xA
NVR Size in bytes :0x100
Number of bytes used :0xD0
Basic Field Address :0xB
Customer Field Address :0x77
Vendor Field Address :0xA7
Extended Vendor Field Address :0x100
Reserved :0x0
Transceiver type :0x2 =X2
Optical connector type :0x1 =SC
Bit encoding :0x1 =NRZ
Normal BitRate in multiple of 1M b/s :0x2848
Protocol Type :0x1 =10GgE

Standards Compliance Codes :
10GBe Code Byte 0 :0x2 =10GBASE-LR
10GBe Code Byte 1 :0x0
SONET/SDH Code Byte 0 :0x0
SONET/SDH Code Byte 1 :0x0
SONET/SDH Code Byte 2 :0x0
SONET/SDH Code Byte 3 :0x0
10GFC Code Byte 0 :0x0
10GFC Code Byte 1 :0x0
10GFC Code Byte 2 :0x0
10GFC Code Byte 3 :0x0
Transmission range in 10m :0x3E8

Fibre Type :
Fibre Type Byte 0 :0x40 =NDSF only
show idprom

Fibre Type Byte 1 :0x0 =Unspecified

Centre Optical Wavelength in 0.01nm steps - Channel 0 :0x1 0xFF 0xB8
Centre Optical Wavelength in 0.01nm steps - Channel 1 :0x0 0x0 0x0
Centre Optical Wavelength in 0.01nm steps - Channel 2 :0x0 0x0 0x0
Centre Optical Wavelength in 0.01nm steps - Channel 3 :0x0 0x0 0x0
Package Identifier OUI :0xEC09820
Transceiver Vendor OUI :0x3400800
Transceiver vendor name :CISCO-OPNEXT, INC
Part number provided by transceiver vendor :TRT5021EN-SMC-W
Revision level of part number provided by vendor :00
Vendor serial number :ONJ08290041
Vendor manufacturing date code :2004072000

Reserved1 : 00 02 02 20 D1 00 00
Basic Field Checksum :0x10

Customer Writable Area :
0x00: 58 32 2D 31 30 47 42 2D 4C 52 20 20 20 20 20 20
0x10: 20 20 20 20 20 0F 4E 4A 30 38 32 39 30 30 30 34 31
0x20: 31 30 2D 32 30 33 36 2D 30 31 20 20 41 30 31 30 20

Vendor Specific :
0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x30: 00 00 00 00 11 E2 69 A9 2F 95 C6 EE D2 DA B3 FD
0x40: 6A 4A 24 CB 00 00 00 00 00 00 00 00 00 00 RF FC
0x50: F4 AC 1A D7 11 08 01 36 00

Switch#

This example shows how to display IDPROM information for the supervisor engine:

Switch# show idprom supervisor
Supervisor Idprom:
Common Block Signature = 0xABAB
Common Block Version = 1
Common Block Length = 144
Common Block Checksum = 4153
Idprom Size = 256
Block Count = 2
FRU Major Type = 0x4101
FRU Minor Type = 333
OEM String = Cisco Systems, Inc.
Product Number = WS-X4014
Serial Number = JAB05320CCE
Part Number = 73-6854-04
Part Revision = 05
Manufacturing Deviation String = 0
Hardware Revision = 0.4
Manufacturing Bits = 0x0000
Engineering Bits = 0x0000
Snmp OID = 0.0.0.0.0.0.0.0.0
Power Consumption = 0
RMA Failure Code = 0 0 0 0
Supervisor Block Signature = 0x4101
Supervisor Block Version = 1
Supervisor Block Length = 24
Supervisor Block Checksum = 548
Feature Bits = 0x00000000000000000000000000000000
Card Feature Index = 95
MAC Base = 0007.0ee5.2a44
MAC Count = 2
Switch#
This example shows how to display IDPROM information for the chassis:

```
Switch# show idprom chassis
Chassis Idprom:
  Common Block Signature = 0xABAB
  Common Block Version = 1
  Common Block Length = 144
  Common Block Checksum = 4285
  Idprom Size = 256
  Block Count = 2
  FRU Major Type = 0x4001
  FRU Minor Type = 24
  OEM String = Cisco Systems, Inc.
  Product Number = WS-C4507R
  Serial Number = FOX04473737
  Part Number = 73-4289-02
  Part Revision = 02
  Manufacturing Deviation String = 0x00
  Hardware Revision = 0.2
  Manufacturing Bits = 0x00000000
  Snmp OID = 0.0.0.0.0.0.0.0
  Chassis Block Signature = 0x4001
  Chassis Block Version = 1
  Chassis Block Length = 22
  Chassis Block Checksum = 421
  Feature Bits = 0x0000000000000000
  MAC Base = 0004.dd42.2600
  MAC Count = 1024
Switch#
```

This example shows how to display IDPROM information for power supply 1:

```
Switch# show idprom power-supply 1
Power Supply 0 Idprom:
  Common Block Signature = 0xABAB
  Common Block Version = 1
  Common Block Length = 144
  Common Block Checksum = 10207
  Idprom Size = 256
  Block Count = 1
  FRU Major Type = 0xAB01
  FRU Minor Type = 8224
  OEM String = Cisco Systems, Inc.
  Product Number = WS-CAC-1440W
  Serial Number = ACP05180002
  Part Number = 34-XXXX-01
  Part Revision = A0
  Manufacturing Deviation String =
  Hardware Revision = 1.1
  Manufacturing Bits = 0x0000
  Engineering Bits = 0x3031
  Snmp OID = 9.12.3.65535.65535.65535.65535.65535
  Power Consumption = -1
  RMA Failure Code = 255 255 255 255
  Power Supply Block Signature = 0xFFFF
  PowerSupply Block Version = 255
  PowerSupply Block Length = 255
  PowerSupply Block Checksum = 65535
  Feature Bits = 0x0000000000000000
  Current @ 110V = -1
  Current @ 220V = -1
  StackMIB OID = 65535
```
This example shows how to display IDPROM information for the fan tray:

```
Switch# show idprom fan-tray
Fan Tray Idprom :
  Common Block Signature = 0xABAB
  Common Block Version = 1
  Common Block Length = 144
  Common Block Checksum = 19781
  Idprom Size = 256
  Block Count = 1
  FRU Major Type = 0x4002
  FRU Minor Type = 0
  OEM String = "Cisco Systems"
  Product Number = WS-X4502-fan
  Serial Number =
  Part Number =
  Part Revision =
  Manufacturing Deviation String =
  Hardware Revision = 0.1
  Manufacturing Bits = 0xFFFF
  Engineering Bits = 0xFFFF
  Snmp OID = 65535.65535.65535.65535.65535.65535.65535.65535
  Power Consumption = -1
  RMA Failure Code = 255 255 255 255
Switch#
```
show interfaces

To display traffic on a specific interface, use the **show interfaces** command.

```
show interfaces [ { fastethernet mod/interface-number } | { gigabitethernet mod/interface-number } | { tengigabitethernet mod/interface-number } | { null interface-number } | vlan vlan_id | status ]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fastethernet</td>
<td>(Optional) Specifies the Fast Ethernet module and interface.</td>
</tr>
<tr>
<td>mod/interface-number</td>
<td></td>
</tr>
<tr>
<td>gigabitethernet</td>
<td>(Optional) Specifies the Gigabit Ethernet module and interface.</td>
</tr>
<tr>
<td>mod/interface-number</td>
<td></td>
</tr>
<tr>
<td>tengigabitethernet</td>
<td>(Optional) Specifies the 10-Gigabit Ethernet module and interface.</td>
</tr>
<tr>
<td>mod/interface-number</td>
<td></td>
</tr>
<tr>
<td>null interface-number</td>
<td>(Optional) Specifies the null interface; the valid value is 0.</td>
</tr>
<tr>
<td>vlan vlan_id</td>
<td>(Optional) Specifies the VLAN; valid values are from 1 to 4094.</td>
</tr>
<tr>
<td>status</td>
<td>(Optional) Displays status information.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Support for extended VLAN addresses was added.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(31)SGA</td>
<td>Support for auto-MDIX reflected in command output.</td>
</tr>
<tr>
<td>12.2(52)SG</td>
<td>Added support for per-VLAN error-disable detection.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The statistics are collected per VLAN for Layer 2 switched packets and Layer 3 switched packets. The statistics are available for both unicast and multicast. The Layer 3 switched packet counts are available for both the ingress and egress directions. The per-VLAN statistics are updated every 5 seconds.

In some cases, the duplex mode that is displayed by the **show interfaces** command is different than that displayed by the **show running-config** command. The duplex mode that is displayed in the **show interfaces** command is the actual duplex mode that the interface is running. The **show interfaces** command shows the operating mode for an interface, but the **show running-config** command shows the configured mode for an interface.
If you do not enter any keywords, all counters for all modules are displayed.

Line cards that support auto-MDIX configuration on their copper media ports include: WS-X4124-RJ45, WS-X4148-RJ with hardware revision 3.0 or later, and WS-X4232-GB-RJ with hardware revision 3.0 or later.

**Examples**

This example shows how to display traffic for Gigabit Ethernet interface 2/5:

```
Switch# show interfaces gigabitethernet2/5
GigabitEthernet9/5 is up, line protocol is up (connected) (vlan-err-dis)
Hardware is C4k 1000Mb 802.3, address is 0001.64f8.3fa5 (bia 0001.64f8.3fa5)
Internet address is 172.20.20.20/24
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec, reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 1000Mb/s
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:00:00, output never, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 1000 bits/sec, 2 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
L2 Switched: ucast: 8199 pkt, 1362060 bytes - mcast: 6980 pkt, 371952 bytes
L3 in Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes
L3 out Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes
300114 packets input, 27301436 bytes, 0 no buffer
Received 43458 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 input packets with dribble condition detected
15181 packets output, 1955836 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 output buffer failures, 0 output buffers swapped out
Switch#
```

This example shows how to display traffic for 10-Gigabit Ethernet interface 1/1:

```
Switch# show interfaces tengigabitethernet1/1
Name: Tengigabitethernet1/1
Switchport: Enabled
Administrative Mode: private-vlan promiscuous trunk
Operational Mode: private-vlan promiscuous (suspended member of bundle Po1)
Administrative Trunking Encapsulation: negotiate
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: none
Trunking Native Mode VLAN: none
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: 202 (VLAN0202) 303 (VLAN0303) 304 (VLAN0304)
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk
Native VLAN tagging: enabled
Administrative private-vlan trunk encapsulation: 802.1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Administrative private-vlan trunk mapping trunk: New 202 (VLAN0202) 303 (VLAN0303) 304 (VLAN0304) 204 (VLAN0204) 305 (VLAN0305) 306 (VLAN0306)
```
Chapter 2 Cisco IOS Commands for the Catalyst 4500 Series Switches

```
show interfaces

Operational private-vlan: 202 (VLAN0202) 303 (VLAN0303) 304 (VLAN0304)
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL

Switch#

This example shows how to verify the status of auto-MDIX on an RJ-45 port:

Note
You can verify the configuration setting and the operational state of auto-MDIX on the interface by entering the `show interfaces` EXEC command. This field is applicable and appears only on the `show interfaces` command output for 10/100/1000BaseT RJ-45 copper ports on supported linecards including WS-X4124-RJ45, WS-X4148-RJ with hardware revision 3.0 or later, and WS-X4232-GB-RJ with hardware revision 3.0 or later.

FastEthernet6/3 is up, line protocol is up (connected)
Hardware is Fast Ethernet Port, address is 0003.6ba8.ee68 (bia 0003.6ba8.ee68)
MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 100Mb/s, link type is auto, media type is 10/100BaseTX
input flow-control is unsupported output flow-control is unsupported
Auto-MDIX on (operational: on)
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output never, output hang never
Last clearing of "show interface" counters never
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
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts (0 multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 input packets with dribble condition detected
157082 packets output, 13418032 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out

Switch#

This example shows how to display status information for Gigabit Ethernet interface 1/2:

Switch# show interfaces gigabitethernet1/2 status

<table>
<thead>
<tr>
<th>Port</th>
<th>Name</th>
<th>Status</th>
<th>Vlan</th>
<th>Duplex</th>
<th>Speed</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/2</td>
<td></td>
<td>notconnect</td>
<td>1</td>
<td>auto</td>
<td>1000</td>
<td>1000-XWDM-RXONLY</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display status information for the interfaces on the supervisor engine:

Switch# show interfaces status

<table>
<thead>
<tr>
<th>Port</th>
<th>Name</th>
<th>Status</th>
<th>Vlan</th>
<th>Duplex</th>
<th>Speed</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te1/1</td>
<td></td>
<td>connected</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>10GBase-LR</td>
</tr>
<tr>
<td>Te1/2</td>
<td></td>
<td>connected</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>10GBase-LR</td>
</tr>
</tbody>
</table>

Switch#
show interfaces (virtual switch)

To display traffic that is seen by a specific interface, use the `show interfaces` command in EXEC mode.

```
show interfaces [interface iswitch-num/mod/port]
```

**Syntax Description**

- `interface` *(Optional)* Specifies interface type
- `switch-num` Specifies port number.
- `/mod` Specifies module number
- `/port` Specifies port number

**Defaults**

This command has no defaults settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS XE 3.4.0SG and 15.1(2)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Statistics are collected on a per-VLAN basis for Layer 2-switched packets and Layer 3-switched packets. Statistics are available for both unicast and multicast traffic. The Layer 3-switched packet counts are available for both ingress and egress directions. The per-VLAN statistics are updated every 5 seconds.

In some cases, you might see a difference in the duplex mode that is displayed between the `show interfaces (virtual switch)` command and the `show running-config switch (virtual switch)` command. In this case, the duplex mode that is displayed in the `show interfaces (virtual switch)` command is the actual duplex mode that the interface is running. The `show interfaces (virtual switch)` command shows the operating mode for an interface, while the `show running-config switch (virtual switch)` command shows the configured mode for an interface.

If you do not specify an interface, the information for all interfaces is displayed.

The output of the `show interfaces GigabitEthernet` command displays an extra 4 bytes for every packet that is sent or received. The extra 4 bytes are the Ethernet frame CRC in the input and output byte statistics.
Examples

The following example shows how to display traffic for a specific interface:

Router# show interfaces GigabitEthernet switch 1/3/3
GigabitEthernet1/3/3 is up, line protocol is up (connected)
   Hardware is C6k 1000Mb 802.3, address is 000f.2305.49c0 (bia 000f.2305.49c0)
   MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
   reliability 255/255, txload 1/255, rxload 1/255
   Encapsulation 802.1Q Virtual LAN, Vlan ID 1., loopback not set
   Keepalive set (10 sec)
   Full-duplex. 1000Mb/s, media type is LH
   input flow-control is off, output flow-control is on
   Clock mode is auto
   ARP type: ARPA, ARP Timeout 04:00:00
   Last input 00:00:19, output 00:00:00, 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
   L2 Switched: ucast: 360 pkt, 23040 bytes - mcast: 0 pkt, 0 bytes
   L3 in Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes mcast
   L3 out Switched: ucast: 0 pkt, 0 bytes mcast: 0 pkt, 0 bytes mcast
   437 packets input, 48503 bytes, 0 no buffer
   Received 76 broadcasts (0 IP multicast)
   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
   86 packets output, 25910 bytes, 0 underruns
   0 output errors, 0 collisions, 0 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

Router#

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>interface (virtual switch)</td>
<td>Selects an interface to configure and enters the interface configuration mode.</td>
</tr>
</tbody>
</table>
show interfaces counters

To display the traffic on the physical interface, use the show interfaces counters command.

    show interfaces counters [all | detail | errors | storm-control | trunk] [module mod]

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>(Optional) Displays all the interface counters including errors, trunk, and detail.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Displays the detailed interface counters.</td>
</tr>
<tr>
<td>errors</td>
<td>(Optional) Displays the interface error counters.</td>
</tr>
<tr>
<td>storm-control</td>
<td>(Optional) Displays the number of packets discarded due to suppression on the interface.</td>
</tr>
<tr>
<td>trunk</td>
<td>(Optional) Displays the interface trunk counters.</td>
</tr>
<tr>
<td>module mod</td>
<td>(Optional) Limits the display to interfaces on a specific module.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Support for storm control.</td>
</tr>
<tr>
<td>12.2(18)EW</td>
<td>Support for the display of total suppression discards.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

If you do not enter any keywords, all the counters for all modules are displayed.

The display for the storm-control keyword includes the suppressed multicast bytes.

### Examples

This example shows how to display the error counters for a specific module:

```
Switch# show interfaces counters errors module 1

Port        Align-Err    FCS-Err   Xmit-Err    Rcv-Err UnderSize
Gi1/1               0          0          0          0         0
Gi1/2               0          0          0          0         0

Port      Single-Col Multi-Col Late-Col Excess-Col Carri-Sen Runts Giants
Gi1/1              0         0         0          0         0 0
Gi1/2              0         0         0          0         0 0

Switch#
```
This example shows how to display the traffic that is seen by a specific module:

```bash
Switch# show interfaces counters module 1
```

<table>
<thead>
<tr>
<th>Port</th>
<th>InOctets</th>
<th>InUcastPkts</th>
<th>InMcastPkts</th>
<th>InBcastPkts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>OutOctets</th>
<th>OutUcastPkts</th>
<th>OutMcastPkts</th>
<th>OutBcastPkts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the trunk counters for a specific module:

```bash
Switch# show interfaces counters trunk module 1
```

<table>
<thead>
<tr>
<th>Port</th>
<th>TrunkFramesTx</th>
<th>TrunkFramesRx</th>
<th>WrongEncap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the number of packets that are discarded due to suppression:

```bash
Switch# show interfaces counters storm-control
```

Multicast Suppression : Enabled

<table>
<thead>
<tr>
<th>Port</th>
<th>BcastSuppLevel</th>
<th>TotalSuppressionDiscards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa5/35</td>
<td>10.00%</td>
<td>6278550</td>
</tr>
</tbody>
</table>

Switch#

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show interfaces (virtual switch)</code></td>
<td>Displays the interface capabilities for an interface or for all the interfaces on a switch.</td>
</tr>
</tbody>
</table>
show interfaces counters (virtual switch)

To display the traffic that the physical interface sees, use the show interfaces counters command in EXEC mode.

```
show interfaces [interface switch-num/mod/port] counters [errors | etherchannel | protocol status | storm-control]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>interface</strong></td>
<td>(Optional) Specifies the interface type.</td>
</tr>
<tr>
<td>switch-num</td>
<td>Specifies the switch number; valid values are 1 and 2.</td>
</tr>
<tr>
<td>/mod</td>
<td>Specifies the module number.</td>
</tr>
<tr>
<td>/port</td>
<td>Specifies the port number.</td>
</tr>
<tr>
<td><strong>errors</strong></td>
<td>(Optional) Displays the interface error counters.</td>
</tr>
<tr>
<td><strong>etherchannel</strong></td>
<td>(Optional) Displays information about the EtherChannel interface.</td>
</tr>
<tr>
<td><strong>protocol status</strong></td>
<td>(Optional) Displays information about the current status of the enabled protocols.</td>
</tr>
<tr>
<td><strong>storm-control</strong></td>
<td>(Optional) Displays the discard count and the level settings for each mode.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS XE 3.4.0SG and 15.1(2)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The show interfaces counters command displays the number of all of the packets arriving and includes the number of packets that may be dropped by the interface due to the storm-control settings. To display the total number of dropped packets, you can enter the show interfaces counters storm-control command.

The show interfaces counters storm-control command displays the discard count and the level settings for each mode. The discard count is a total of all three modes.

If you do not enter any keywords, all counters for all modules are displayed.

If you do not specify an interface, the information for all interfaces is displayed.

When you enter the show interfaces interface counters etherchannel command, follow these guidelines:

- If interface specifies a physical port, the command displays the message "Etherchannel not enabled on this interface."
- If interface is omitted, the command displays the counters for all port channels (in the system) and for their associated physical ports.
- If interface specifies a port channel, the command displays the counters for the port channel and all of the physical ports that are associated with it. In addition, when you enter the command specifying the primary aggregator in a Link Aggregation Control Protocol (LACP) port channel with multiple aggregators, the output includes the statistics for all of the aggregators in the port channels and for the ports that are associated with them.

**Examples**

The following example shows how to display the error counters for a specific:

```
Router# show interfaces gigabitethernet 2/4/47 counters errors
Port        Align-Err  FCS-Err  Xmit-Err  Rcv-Err  UnderSize  OutDiscards
G12/4/47    0          0         0         0         0           0
Port        Single-Col Multi-Col Late-Col Excess-Col Carri-Sen  Runts  s
G12/4/47    0          0         0         0         0           0
Port        SQETest-Err Deferred-Tx IntMacTx-Err IntMacRx-Err Symbol-Err
G12/4/47    0          0         0         0           0
```

Router#

The following example shows how to display traffic that is seen by a specific interface:

```
Router# show interfaces gigabitethernet 1/2/5 counters
Port        InOctets  InUcastPkts  InMcastPkts  InBcastPkts
Gi1/2/5     0          0             0             0
Port        OutOctets  OutUcastPkts  OutMcastPkts  OutBcastPkts
G1/2/5     0          0             0             0
```

Router#

The following example shows how to display the counters for all port channels (in the system) and their associated physical ports:

```
Router# show interfaces counters etherchannel
Port        InOctets  InUcastPkts  InMcastPkts  InBcastPkts
Po1                     0             0             0             0
Po3                     0             0             0             0
Po10                    16341138343  77612803      12212915      14110863
Gi1/4/1                15628478622  77612818      7525970       14110865
Gi1/4/2                7126628810     4686951       5
Po20                    33887345029  88483183      11506653      14101212
Gi1/4/2                33326378013  88491521      7177393       14101663
Gi1/2/5                 5629048370     4330030       6
Port        OutOctets  OutUcastPkts  OutMcastPkts  OutBcastPkts
Po1                     0          0             0             0
Po3                     0          0             0             0
Po10                    33889238079  14101204      99999327       0
Gi1/4/1                33326354634  14101205      95669326       0
Gi1/4/2                5629047070     4330029      7
Po20                    16338422056  14353951      89573339       0
Gi1/4/1                15628501864  14232410      85017290       0
Gi1/4/2                7126630114    4565416      0
```

Router#

The following example shows how to display the counters for all port channels (in the system) and their associated physical ports in Cisco IOS Release 12.2(50)SY and later releases:

```
Router# show interfaces counters etherchannel
Port        InOctets  InUcastPkts  InMcastPkts  InBcastPkts
Po1                     0             0             0             0
Po3                     0             0             0             0
Po10                    16341138343  77612803      12212915      14110863
Gi1/4/1                15628478622  77612818      7525970       14110865
Gi1/4/2                7126628810     4686951       5
Po20                    33887345029  88483183      11506653      14101212
Gi1/4/1                33326378013  88491521      7177393       14101663
Gi1/4/2                5629048370     4330030       6
Po1                     0          0             0             0
Po3                     0          0             0             0
Po10                    33889238079  14101204      99999327       0
Gi1/4/1                33326354634  14101205      95669326       0
Gi1/4/2                5629047070     4330029      7
Po20                    16338422056  14353951      89573339       0
Gi1/4/1                15628501864  14232410      85017290       0
Gi1/4/2                7126630114    4565416      0
```

Router#
The following example shows how to display the protocols enabled for a specific interface:

```
Router# show interfaces gigabitethernet 1/2/5 counters protocol status
Protocols allocated:
  GigabitEthernet1/2/5: Other, IP
Router#
```

The following example shows how to display the discard count and the level settings for each mode for a specific interface:

```
Router# show interfaces gigabitethernet 1/2/5 counters storm-control
Port          UcastSupp %     McastSupp %     BcastSupp %   TotalSuppDiscards
Gi1/2/5             100.0           100.0           100.0                   0
Router#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>clear counters</code></td>
<td>clears the interface counters.</td>
</tr>
</tbody>
</table>
**show interfaces description**

To display a description and status of an interface, use the `show interfaces description` command.

```
show interfaces [interface] description
```

**Syntax Description**

*interface*  
(Optional) Type of interface.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display information for all interfaces:

```
Switch# show interfaces description
Interface Status         Protocol Description
P00/0     admin down     down     First interface
P00/1     admin down     down
Gi1/1     up             up       GigE to server farm
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>Includes a specific description about the digital signal processor (DSP) interface.</td>
</tr>
</tbody>
</table>
show interfaces link

To display how long a cable has been disconnected from an interface, use the show interfaces link command:

    show interfaces link [module mod_num]

**Syntax Description**

| module mod_num | (Optional) Limits the display to interfaces on a module. |

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(18)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If the interface state is up, the command displays 0:00. If the interface state is down, the time (in hours, minutes, and seconds) is displayed.

**Examples**

This example shows how to display active link-level information:

```
Switch# show interfaces link

    Port    Name               Down Time
    Gi1/1                           00:00:00
    Gi1/2                           00:00:00
    Gi3/1                           00:00:00
    Gi3/2                           00:00:00
    Fa4/1                           00:00:00
    Fa4/2                           00:00:00
    Fa4/3                           00:00:00
    Fa4/4                           00:00:00
```

This example shows how to display inactive link-level information:

```
Switch# show interfaces link

    Port    Name               Down Time
    Gi3/4                           1 minute 28 secs
    Gi3/5                           1 minute 28 secs
    Gi3/6                           1 minute 28 secs
    Gi4/1                           1 minute 28 secs
```

In this example, the cable has been disconnected from the port for 1 minute and 28 seconds.
show interfaces mtu

To display the maximum transmission unit (MTU) size of all the physical interfaces and SVIs on the switch, use the `show interfaces mtu` command.

```
show interfaces mtu [module mod]
```

**Syntax Description**

- `module mod` (Optional) Limits the display to interfaces on a specific module.

**Defaults**

This command has no default settings.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the MTU size for all interfaces on module 1:

```
Switch> show interfaces mtu module 1

Port    Name     MTU
Gi1/1    1500
Gi1/2    1500
Switch>
```

**Related Commands**

- `mtu`
  
  Enables jumbo frames on an interface by adjusting the maximum size of a packet or maximum transmission unit (MTU).
show interfaces private-vlan mapping

To display PVLAN mapping information for VLAN SVIs, use the \texttt{show interfaces private-vlan mapping} command.

\textbf{show interfaces private-vlan mapping [active]}

\textbf{Syntax Description}

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>active</td>
<td>(Optional) Displays active interfaces only.</td>
</tr>
</tbody>
</table>

\textbf{Defaults}

This command has no default settings.

\textbf{Command Modes}

Privileged EXEC mode

\textbf{Command History}

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

\textbf{Usage Guidelines}

This command displays SVI information only.

\textbf{Examples}

This example shows how to display PVLAN mapping information:

\begin{verbatim}
Switch# show interfaces private-vlan mapping
Interface Secondary VLAN Type
---------- ------------------ 
vlan2      301             isolated
vlan2      302             isolated
Switch#
\end{verbatim}

\textbf{Related Commands}

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>\texttt{private-vlan}</td>
<td>Configures private VLANs and the association between a private VLAN and a secondary VLAN.</td>
</tr>
<tr>
<td>\texttt{private-vlan mapping}</td>
<td>Creates a mapping between the primary and the secondary VLANs so that both share the same primary VLAN SVI.</td>
</tr>
</tbody>
</table>
show interfaces status

To display the interface status or a list of interfaces in error-disabled state, use the `show interfaces status` command.

```
show interfaces status [err-disabled | inactive] [module {module}]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>err-disabled</td>
<td>(Optional) Displays interfaces in error-disabled state.</td>
</tr>
<tr>
<td>inactive</td>
<td>(Optional) Displays interfaces in inactive state.</td>
</tr>
<tr>
<td>module module</td>
<td>(Optional) Displays interfaces on a specific module.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(40)SG</td>
<td>Support for WS-X4606-10GE-E Twin Gigabit converter introduced.</td>
</tr>
<tr>
<td>12.2(52)SG</td>
<td>Support for per-VLAN error-disable was introduced by adding Err-Disabled VLAN column to output.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

When at least one VLAN on a port is error-disabled the output for the `show interfaces status` command will display `vl-err-dis` in the VLAN column.

**Examples**

This example shows how to display the status of all interfaces:

```
Switch# show interfaces status

<table>
<thead>
<tr>
<th>Port</th>
<th>Name</th>
<th>Status</th>
<th>Vlan</th>
<th>Duplex</th>
<th>Speed</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te1/1</td>
<td></td>
<td>connected</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>10GBase-LR</td>
</tr>
<tr>
<td>Te1/2</td>
<td></td>
<td>connected</td>
<td>vl-err-dis</td>
<td>full</td>
<td>10G</td>
<td>10GBase-LR</td>
</tr>
</tbody>
</table>

Switch#
```

This example shows how to display the status of interfaces in an error-disabled state:

```
Switch# show interfaces status err-disabled

<table>
<thead>
<tr>
<th>Port</th>
<th>Name</th>
<th>Status</th>
<th>Reason</th>
<th>Err-Disabled VLANs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa9/4</td>
<td></td>
<td>notconnect</td>
<td>link-flap</td>
<td></td>
</tr>
<tr>
<td>Fa9/5</td>
<td></td>
<td>err-disabled</td>
<td>psecure_violation</td>
<td>3-5</td>
</tr>
<tr>
<td>Fa9/6</td>
<td></td>
<td>connected</td>
<td>psecure_violation</td>
<td>10,15</td>
</tr>
</tbody>
</table>

Switch#
```
This example shows how to display the Gigabit Ethernet interfaces on a WS-X4606-10GE-E switch using the TwinGig Convertor:

Switch# `show interfaces status module 1`

<table>
<thead>
<tr>
<th>Port Name</th>
<th>Status</th>
<th>Vlan</th>
<th>Duplex</th>
<th>Speed</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te1/1</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>No X2</td>
</tr>
<tr>
<td>Te1/2</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>No X2</td>
</tr>
<tr>
<td>Te1/3</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>No X2</td>
</tr>
<tr>
<td>Te1/4</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>No X2</td>
</tr>
<tr>
<td>Te1/5</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>No X2</td>
</tr>
<tr>
<td>Te1/6</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>10G</td>
<td>No X2</td>
</tr>
<tr>
<td>Gi1/7</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/8</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/9</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/10</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/11</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/12</td>
<td>notconnect</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/13</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/14</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/15</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/16</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/17</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
<tr>
<td>Gi1/18</td>
<td>inactive</td>
<td>1</td>
<td>full</td>
<td>1000</td>
<td>No Gbic</td>
</tr>
</tbody>
</table>

Switch#

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>errdisable detect</code></td>
<td>Enables error-disable detection.</td>
</tr>
<tr>
<td><code>hw-module port-group</code></td>
<td>Selects either Gigabit Ethernet or Ten Gigabit Ethernet interfaces on your module.</td>
</tr>
<tr>
<td><code>show errdisable recovery</code></td>
<td>Displays error-disable recovery timer information.</td>
</tr>
</tbody>
</table>
show interfaces switchport

To display the administrative and operational status of a switching (nonrouting) port, use the **show interfaces switchport** command.

```
show interfaces switchport (interface-id) switchport (module mod)
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>interface-id</strong></td>
<td>(Optional) Interface ID for the physical port.</td>
</tr>
<tr>
<td><strong>module mod</strong></td>
<td>(Optional) Limits the display to interfaces on the specified module; valid values are from 1 to 6.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Support for per-interface display.</td>
</tr>
<tr>
<td>12.2(18)EW</td>
<td>Support for displaying the status of native VLAN tagging in the command output.</td>
</tr>
<tr>
<td>15.1.0 SG</td>
<td>Support for PVLAN modes over EtherChannel. Modes include: private-vlan host, private-vlan promiscuous, private-vlan trunk secondary, and private-vlan trunk promiscuous.</td>
</tr>
</tbody>
</table>

### Examples

This example shows how to display switch-port information using the **begin** output modifier:

```
Switch# show interfaces switchport | include VLAN
Name: Fa5/6
Access Mode VLAN: 200 (VLAN0200)
Trunking Native Mode VLAN: 1 (default)
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: ALL
Switch#
```

This example shows how to display switch-port information for module 1:

```
Switch# show interfaces switchport module 1
Name: Gi1/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: down
Administrative Trunking Encapsulation: negotiate
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Operational private-vlan: none
Trunking VLANs Enabled: ALL
```
show interfaces switchport

Pruning VLANs Enabled: 2-1001

Name: Gi1/2
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: down
Administrative Trunking Encapsulation: negotiate
Negotiation of Trunking: on
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Operational private-vlan: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Switch#

This example shows how to display the status of native VLAN tagging on the port:

Switch# show interfaces f3/1 switchport
show interface f3/1 switchport
Name: Fa3/1
Switchport: Enabled
Administrative Mode: private-vlan promiscuous
Operational Mode: private-vlan trunk secondary
Administrative Trunking Encapsulation: negotiate
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: 1
Administrative private-vlan trunk Native VLAN tagging: enabled
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: 1
Administrative private-vlan trunk associations: none
Administrative private-vlan trunk mappings:
  10 (VLAN0010) 100 (VLAN0100)
Operational private-vlan:
  10 (VLAN0010) 100 (VLAN0100)
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Unknown unicast blocked: disabled
Unknown multicast blocked: disabled
Appliance trust: none
Switch#

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>show interfaces (virtual switch)</td>
<td>Displays the interface capabilities for an interface or for all interfaces on a switch.</td>
</tr>
<tr>
<td></td>
<td>show interfaces counters</td>
<td>Displays the traffic on the physical interface.</td>
</tr>
</tbody>
</table>
show interfaces transceiver

To display diagnostic-monitoring data for all interfaces that have transceivers installed, use the show interfaces transceiver command.

```
show interfaces { [[int_name] transceiver { [detail] } | transceiver [module mod] | detail [module mod]] }
```

### Syntax Description

- **int_name** (Optional) Interface name.
- **detail** (Optional) Displays the calibrated values and the A2D readouts if the readout values differ from the calibrated values. Also displays the high-alarm, high-warning, low-warning, and low-alarm thresholds.
- **module mod** (Optional) Limits the display to interfaces on a specific module.

### Defaults

The noninterface-specific versions of the show interfaces transceiver command are enabled by default.

The interface-specific versions of these commands are enabled by default if the specified interface has a transceiver (GBIC or SFP) that is configured for diagnostic monitoring, and the transceiver is in a module that supports diagnostic monitoring.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(20)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(18)EW</td>
<td>Support for the calibration keyword was withdrawn.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

The show interfaces transceiver command provides useful information under the following conditions:

- At least one transceiver is installed on a chassis that is configured for diagnostic monitoring.
- The transceiver is in a module that supports diagnostic monitoring.

If you notice that the alarm and warning flags have been set on a transceiver, reenter the command to confirm.
### Examples

This example shows how to display diagnostic monitoring data for all interfaces with transceivers installed on the switch:

```bash
Switch# show interfaces transceiver
```

If device is externally calibrated, only calibrated values are printed.
NA or N/A: not applicable, Tx: transmit, Rx: receive.
mA: milliamperes, dBm: decibels (milliwatts).

<table>
<thead>
<tr>
<th>Port</th>
<th>Temperature (Celsius)</th>
<th>Voltage (Volts)</th>
<th>Current (mA)</th>
<th>Optical Tx Power (dBm)</th>
<th>Optical Rx Power (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/1</td>
<td>48.1</td>
<td>3.30</td>
<td>0.0</td>
<td>8.1 ++</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>33.0</td>
<td>3.30</td>
<td>1.8</td>
<td>-10.0</td>
<td>-36.9</td>
</tr>
<tr>
<td>Gi2/1</td>
<td>43.7</td>
<td>5.03</td>
<td>50.6 +</td>
<td>-16.7 --</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>39.2</td>
<td>5.02</td>
<td>25.7</td>
<td>0.8</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Switch#

### Note
The value for the Optical Tx Power (in dBm) equals ten times log (Tx Power in mW). If the Tx Power value is 3 mW, then the Optical Tx Power value equals 10 * log (3), which equals 10 * .477 or 4.77 dBm. The Optical Rx Power value behaves similarly. If the Tx Power or the Rx Power is zero, then its dBm value is undefined and is shown as N/A (not applicable).

This example shows how to display detailed diagnostic monitoring data, including calibrated values, alarm and warning thresholds, A2D readouts, and alarm and warning flags. The A2D readouts are reported separately in parentheses only if they differ from the calibrated values:

```bash
Switch# show interfaces transceiver detail
```

mA: milliamperes, dBm: decibels (milliwatts), NA or N/A: not applicable.
A2D readouts (if they differ), are reported in parentheses.
The threshold values are calibrated.

<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>Gi1/1</td>
<td>48.1</td>
<td>100.0</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>34.9</td>
<td>100.0</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Gi2/1</td>
<td>43.5</td>
<td>70.0</td>
<td>60.0</td>
<td>5.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>39.1</td>
<td>70.0</td>
<td>60.0</td>
<td>5.0</td>
<td>0.0</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>Gi1/1</td>
<td>3.30</td>
<td>6.50</td>
<td>6.50</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>3.30</td>
<td>6.50</td>
<td>6.50</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi2/1</td>
<td>5.03</td>
<td>5.50</td>
<td>5.25</td>
<td>4.75</td>
<td>4.50</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>5.02</td>
<td>5.50</td>
<td>5.25</td>
<td>4.75</td>
<td>4.50</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>Gi1/1</td>
<td>0.0</td>
<td>130.0</td>
<td>130.0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>1.7</td>
<td>130.0</td>
<td>130.0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi2/1</td>
<td>50.6</td>
<td>+</td>
<td>60.0</td>
<td>40.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>25.8</td>
<td></td>
<td>60.0</td>
<td>40.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>
This example shows how to display the monitoring data for the interfaces that have transceivers installed on module 2:

```
Switch# show interfaces transceiver module 2
```

If device is externally calibrated, only calibrated values are printed.
NA or N/A: not applicable, Tx: transmit, Rx: receive.
mA: milliamperes, dBm: decibels (milliwatts).

### Optical Transmit Power (dBm)

<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>Gi1/1</td>
<td>8.1</td>
<td>++</td>
<td>8.1</td>
<td>8.1</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>-9.8</td>
<td></td>
<td>8.1</td>
<td>8.1</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi2/1</td>
<td>-16.7 (-13.0)</td>
<td>--</td>
<td>3.4</td>
<td>3.2</td>
<td>-0.3</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>0.8 (5.1)</td>
<td></td>
<td>3.4</td>
<td>3.2</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

### Optical Receive Power (dBm)

<table>
<thead>
<tr>
<th>Port</th>
<th>Optical Receive 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>Gi1/1</td>
<td>N/A</td>
<td>8.1</td>
<td>8.1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi1/2</td>
<td>-30.9</td>
<td>8.1</td>
<td>8.1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi2/1</td>
<td>N/A (-28.5)</td>
<td>5.9</td>
<td>-6.7</td>
<td>-28.5</td>
<td>-28.5</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>N/A (-19.5)</td>
<td>5.9</td>
<td>-6.7</td>
<td>-28.5</td>
<td>-28.5</td>
</tr>
</tbody>
</table>

### Temperature, Voltage, Current, and Power Values

<table>
<thead>
<tr>
<th>Port</th>
<th>Temperature (Celsius)</th>
<th>Voltage (Volts)</th>
<th>Current (mA)</th>
<th>Tx Power (dBm)</th>
<th>Rx Power (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/1</td>
<td>43.7</td>
<td>5.03</td>
<td>50.6 +</td>
<td>-16.7</td>
<td>N/A</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>39.2</td>
<td>5.02</td>
<td>25.7</td>
<td>0.8</td>
<td>N/A</td>
</tr>
</tbody>
</table>

This example shows how to display the detailed monitoring data for the interfaces that have transceivers installed on module 2:

```
Switch# show interfaces transceiver detail module 2
```

mA: milliamperes, dBm: decibels (milliwatts), NA or N/A: not applicable.
A2D readouts (if they differ), are reported in parentheses.
The threshold values are calibrated.

### Optical Transmit Power (dBm)

<table>
<thead>
<tr>
<th>Port</th>
<th>Optical 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>Gi2/1</td>
<td>43.5</td>
<td>70.0</td>
<td>60.0</td>
<td>5.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>39.1</td>
<td>70.0</td>
<td>60.0</td>
<td>5.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

### Optical Receive Power (dBm)

<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>Gi2/1</td>
<td>5.03</td>
<td>5.50</td>
<td>5.25</td>
<td>4.75</td>
<td>4.50</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>5.02</td>
<td>5.50</td>
<td>5.25</td>
<td>4.75</td>
<td>4.50</td>
</tr>
</tbody>
</table>
show interfaces transceiver

<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>Gi2/1</td>
<td>50.6</td>
<td>+</td>
<td>60.0</td>
<td>40.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>25.8</td>
<td></td>
<td>60.0</td>
<td>40.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the monitoring data for the transceivers on interface Gi1/2:

Switch# show interfaces g1/2 transceiver
ITU Channel 23 (1558.98 nm),
Transceiver is externally calibrated.
If device is externally calibrated, only calibrated values are printed.
NA or N/A: not applicable, Tx: transmit, Rx: receive.
mA: milliamperes, dBm: decibels (milliwatts).

<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>Gi2/1</td>
<td>-16.7 (-13.0)</td>
<td>--</td>
<td>3.4</td>
<td>3.2</td>
<td>-0.3</td>
</tr>
<tr>
<td>Gi2/2</td>
<td>0.8 (  5.1)</td>
<td></td>
<td>3.4</td>
<td>3.2</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display detailed the monitoring data for the transceivers on interface Gi1/2:

Switch# show interfaces g1/2 transceiver detail
ITU Channel 23 (1558.98 nm),
Transceiver is externally calibrated.
mA: milliamperes, dBm: decibels (milliwatts), NA or N/A: not applicable.
A2D readouts (if they differ), are reported in parentheses.
The threshold values are calibrated.

<table>
<thead>
<tr>
<th>Port</th>
<th>Temperature (Celsius)</th>
<th>Voltage (Volts)</th>
<th>Current (mA)</th>
<th>Optical Tx Power (dBm)</th>
<th>Optical Rx Power (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/1</td>
<td>43.7</td>
<td>5.03</td>
<td>50.6 +</td>
<td>-16.7 --</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Switch#
### show interfaces transceiver

<table>
<thead>
<tr>
<th>Port</th>
<th>Current (milliamperes)</th>
<th>High Alarm (mA)</th>
<th>High Warn (mA)</th>
<th>Low Warn (mA)</th>
<th>Low Alarm (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/1</td>
<td>50.6</td>
<td>60.0</td>
<td>40.0</td>
<td>10.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

#### Optical Transmit Power (dBm)

<table>
<thead>
<tr>
<th>Port</th>
<th>Threshold (dBm)</th>
<th>High Alarm (dBm)</th>
<th>High Warn (dBm)</th>
<th>Low Warn (dBm)</th>
<th>Low Alarm (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/1</td>
<td>-16.7 (-13.0)</td>
<td>3.4</td>
<td>3.2</td>
<td>-0.3</td>
<td>-0.5</td>
</tr>
</tbody>
</table>

#### Optical Receive Power (dBm)

<table>
<thead>
<tr>
<th>Port</th>
<th>Threshold (dBm)</th>
<th>High Alarm (dBm)</th>
<th>High Warn (dBm)</th>
<th>Low Warn (dBm)</th>
<th>Low Alarm (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi2/1</td>
<td>N/A (-28.5)</td>
<td>5.9</td>
<td>-6.7</td>
<td>-28.5</td>
<td>-28.5</td>
</tr>
</tbody>
</table>

---

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show idprom</td>
<td>Displays the IDPROMs for the chassis.</td>
</tr>
<tr>
<td>show interfaces status</td>
<td>Displays the interface status or a list of interfaces in error-disabled state.</td>
</tr>
</tbody>
</table>
show interfaces trunk

To display port and module interface-trunk information, use the `show interfaces trunk` command.

```plaintext
show interfaces trunk [module mod]
```

**Syntax Description**

- **module mod** (Optional) Limits the display to interfaces on the specified module; valid values are from 1 to 6.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If you do not specify a keyword, only information for trunking ports is displayed.

**Examples**

This example shows how to display interface-trunk information for module 5:

```plaintext
Switch# show interfaces trunk module 5

<table>
<thead>
<tr>
<th>Port</th>
<th>Mode</th>
<th>Encapsulation</th>
<th>Status</th>
<th>Native vlan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa5/1</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/2</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/3</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/4</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/5</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/6</td>
<td>off</td>
<td>negotiate</td>
<td>not-trunking</td>
<td>10</td>
</tr>
<tr>
<td>Fa5/7</td>
<td>off</td>
<td>negotiate</td>
<td>not-trunking</td>
<td>10</td>
</tr>
<tr>
<td>Fa5/8</td>
<td>off</td>
<td>negotiate</td>
<td>not-trunking</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/9</td>
<td>desirable</td>
<td>n-isl</td>
<td>trunking</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/10</td>
<td>desirable</td>
<td>negotiate</td>
<td>not-trunking</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/11</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
<tr>
<td>Fa5/12</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fa5/48</td>
<td>routed</td>
<td>negotiate</td>
<td>routed</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>Vlans allowed on trunk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa5/1</td>
<td>none</td>
</tr>
<tr>
<td>Fa5/2</td>
<td>none</td>
</tr>
<tr>
<td>Fa5/3</td>
<td>none</td>
</tr>
<tr>
<td>Fa5/4</td>
<td>none</td>
</tr>
<tr>
<td>Fa5/5</td>
<td>none</td>
</tr>
<tr>
<td>Fa5/6</td>
<td>none</td>
</tr>
<tr>
<td>Fa5/7</td>
<td>none</td>
</tr>
<tr>
<td>Fa5/8</td>
<td>200</td>
</tr>
<tr>
<td>Fa5/9</td>
<td>1-1005</td>
</tr>
</tbody>
</table>
```
This example shows how to display trunking information for active trunking ports:

```
Switch# show interfaces trunk

Port    Mode         Encapsulation  Status       Native vlan
Fa5/9   desirable    n-isl          trunking      1

Port    Vlans allowed on trunk
Fa5/9   1-1005

Port    Vlans allowed and active in management domain
Fa5/9   1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-802,850,917,999,1002-1005

Port    Vlans in spanning tree forwarding state and not pruned
Fa5/9   1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-802,850,917,999,1002-1005
```

Fa5/10  none
Fa5/11  none
Fa5/12  none

Fa5/48  none

Port    Vlans allowed and active in management domain
Fa5/1   none
Fa5/2   none
Fa5/3   none
Fa5/4   none
Fa5/5   none
Fa5/6   none
Fa5/7   none
Fa5/8   200
Fa5/9   1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-802,850,917,999,1002-1005

Fa5/10  none
Fa5/11  none
Fa5/12  none

Fa5/48  none

Port    Vlans in spanning tree forwarding state and not pruned
Fa5/1   none
Fa5/2   none
Fa5/3   none
Fa5/4   none
Fa5/5   none
Fa5/6   none
Fa5/7   none
Fa5/8   200
Fa5/9   1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-802,850,917,999,1002-1005

Fa5/10  none
Fa5/11  none

Fa5/48  none

Switch#
show ip arp inspection

To show the status of dynamic ARP inspection for a specific range of VLANs, use the `show ip arp inspection` command.

```
show ip arp inspection 
([statistics] vlan vlan-range | interfaces [interface-name])
```

**Syntax Description**

- `statistics` (Optional) Displays statistics for the following types of packets that have been processed by this feature: forwarded, dropped, MAC validation failure, and IP validation failure.
- `vlan vlan-range` (Optional) When used with the `statistics` keyword, displays the statistics for the selected range of VLANs. Without the `statistics` keyword, displays the configuration and operating state of DAI for the selected range of VLANs.
- `interfaces interface-name` (Optional) Displays the trust state and the rate limit of ARP packets for the provided interface. When the interface name is not specified, the command displays the trust state and rate limit for all applicable interfaces in the system.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the statistics of packets that have been processed by DAI for VLAN 3:

```
Switch# show ip arp inspection statistics vlan 3
```

```
Vlan | Forwarded | Dropped | DHCP Drops | ACL Drops
---- | --------- | ------- | ---------- | --------
3    | 31753     | 102407  | 102407     | 0        
Vlan | DHCP Permits | ACL Permits | Source MAC Failures |
---- | ------------- | ----------- | ------------------- |
3    | 31753        | 0          | 0                  |
Vlan | Dest MAC Failures | IP Validation Failures |
---- | ------------------ |------------------------ |
3    | 0                | 0                      |
Switch#
```
This example shows how to display the statistics of packets that have been processed by DAI 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>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>68322</td>
<td>220356</td>
<td>220356</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>101</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1006</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1007</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>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>68322</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>101</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1006</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1007</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>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>101</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1006</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1007</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the configuration and operating state of DAI for VLAN 1:

```
Switch# show ip arp inspection vlan 1
```

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

```
Vlan                  Configuration     Operation    ACL Match     Static ACL
----                  -------------     ---------     -----------     ----------
1                     Enabled         Active       ------------    ----------
```

```
Vlan                  ACL Logging     DHCP Logging
----                  ---------     ------------
1                     Deny          Deny
```

Switch#

This example shows how to display the trust state of Fast Ethernet interface 6/1:

```
Switch# show ip arp inspection interfaces fastEthernet 6/1
```

```
<table>
<thead>
<tr>
<th>Interface</th>
<th>Trust State</th>
<th>Rate (pps)</th>
<th>Burst Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa6/1</td>
<td>Untrusted</td>
<td>20</td>
<td>5</td>
</tr>
</tbody>
</table>
```

Switch#
This example shows how to display the trust state of the interfaces on the switch:

```
Switch# show ip arp inspection interfaces

Interface        Trust State     Rate (pps)
---------------  -----------     ----------
Gi1/1            Untrusted               15
Gi1/2            Untrusted               15
Gi3/1            Untrusted               15
Gi3/2            Untrusted               15
Fa3/3            Trusted               None
Fa3/4            Untrusted               15
Fa3/5            Untrusted               15
Fa3/6            Untrusted               15
Fa3/7            Untrusted               15

Switch#
```

### 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 access list or adds clauses at the end of a predefined list.</td>
</tr>
<tr>
<td><code>clear ip arp inspection log</code></td>
<td>Clears the status of the log buffer.</td>
</tr>
<tr>
<td><code>show ip arp inspection log</code></td>
<td>Displays the status of the log buffer.</td>
</tr>
</tbody>
</table>
show ip arp inspection log

To show the status of the log buffer, use the show ip arp inspection log command.

```
show ip arp inspection log
```

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

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the current contents of the log buffer before and after the buffers are cleared:

```
Switch# show ip arp inspection log
Total Log Buffer Size : 10
Syslog rate : 0 entries per 10 seconds.

Interface       Vlan   Sender MAC            Sender IP       Num of Pkts
---------------- ----- ----------------- --------------- ----------
Fa6/3           1     0002.0002.0002     1.1.1.2         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.3         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.4         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.5         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.6         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.7         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.8         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.9         1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.10        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1     0002.0002.0002     1.1.1.11        1(12:02:52 UTC Fri Apr 25 2003)
--             --     --               --            5(12:02:52 UTC Fri Apr 25 2003)

Switch#
```

This example shows how to clear the buffer with the clear ip arp inspection log command:

```
Switch# clear ip arp inspection log
Switch# show ip arp inspection log
Total Log Buffer Size : 10
Syslog rate : 0 entries per 10 seconds.
No entries in log buffer.
Switch#
```
## show ip arp inspection log

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>arp access-list</strong></td>
<td>Defines an ARP access list or adds clauses at the end of a predefined list.</td>
</tr>
<tr>
<td><strong>clear ip arp inspection log</strong></td>
<td>Clears the status of the log buffer.</td>
</tr>
</tbody>
</table>
show ip cef vlan

To view IP CEF VLAN interface status and configuration information and display the prefixes for a specific interface, use the `show ip cef vlan` command.

```
show ip cef vlan vlan_num [detail]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vlan_num</code></td>
<td>Number of the VLAN.</td>
</tr>
<tr>
<td><code>detail</code></td>
<td>(Optional) Displays detailed information.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the prefixes for a specific VLAN:

```
Switch# show ip cef vlan 1003
Prefix   | Next Hop | Interface |
---------|----------|-----------|
0.0.0.0/0| 172.20.52.1| FastEthernet3/3 |
0.0.0.0/32| receive |           |
10.7.0.0/16| 172.20.52.1| FastEthernet3/3 |
10.16.18.0/23| 172.20.52.1| FastEthernet3/3 |
Switch#
```

This example shows how to display detailed IP CEF information for a specific VLAN:

```
Switch# show ip cef vlan 1003 detail
IP Distributed CEF with switching (Table Version 2364), flags=0x0
1383 routes, 0 reresolve, 0 unresolved (0 old, 0 new)
1383 leaves, 201 nodes, 380532 bytes, 2372 inserts, 989 invalidations
0 load sharing elements, 0 bytes, 0 references
universal per-destination load sharing algorithm, id 9B6C9823
3 CEF resets, 0 revisions of existing leaves
refcounts: 54276 leaf, 51712 node
Adjacency Table has 5 adjacencies
Switch#
```
show ip dhcp snooping

To display the DHCP snooping configuration, use the `show ip dhcp snooping` command.

```
show ip dhcp snooping
```

**Syntax Description**

This command has no arguments or keywords.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(12c)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EWA</td>
<td>Support for option 82 on untrusted ports was added.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the DHCP snooping configuration:

```
Switch# show ip dhcp snooping
Switch DHCP snooping is enabled
DHCP snooping is configured on following VLANs: 500,555
DHCP snooping is operational on following VLANs: 500,555
DHCP snooping is configured on the following L3 Interfaces:
Insertion of option 82 is enabled
circuit-id default format: vlan-mod-port
remote-id: switch123 (string)
Option 82 on untrusted port is not allowed Verification of hwaddr field is enabled DHCP
snooping trust/rate is configured on the following Interfaces:
Interface Trusted Rate limit (pps)
------------------------ ------- ----------------
FastEthernet5/1 yes 100
Custom circuit-ids:
VLAN 555: customer-555
FastEthernet2/1 no unlimited
Custom circuit-ids:
VLAN 500: customer-500
Switch#
```
show ip dhcp snooping binding

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip dhcp snooping</td>
<td>Globally enables DHCP snooping.</td>
</tr>
<tr>
<td>ip dhcp snooping information option</td>
<td>Enables DHCP option 82 data insertion.</td>
</tr>
<tr>
<td>ip dhcp snooping limit rate</td>
<td>Configures the number of the DHCP messages that an interface can receive per second.</td>
</tr>
<tr>
<td>ip dhcp snooping trust</td>
<td>Enables DHCP snooping on a trusted VLAN.</td>
</tr>
<tr>
<td>ip dhcp snooping vlan</td>
<td>Enables DHCP snooping on a VLAN or a group of VLANs.</td>
</tr>
</tbody>
</table>

To display the DHCP snooping binding entries, use the `show ip dhcp snooping binding` command.

```
show ip dhcp snooping binding [ip-address] [mac-address] [vlan vlan_num] [interface interface_num]
```

**Syntax Description**
- **ip-address** (Optional) IP address for the binding entries.
- **mac-address** (Optional) MAC address for the binding entries.
- **vlan vlan_num** (Optional) Specifies a VLAN.
- **interface interface_num** (Optional) Specifies an interface.

**Defaults**
If no argument is specified, the switch will display the entire DHCP snooping binding table.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(12c)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
DHCP snooping is enabled on a VLAN only if both the global snooping and the VLAN snooping are enabled.

To configure a range of VLANs, use the optional `last_vlan` argument to specify the end of the VLAN range.

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

```
Switch# show ip dhcp snooping binding
MacAddress   IP Address  Lease (seconds)  Type        VLAN  Interface
-----------  ----------  --------------   ---------  -----  ------------
0000.0100.0201  10.0.0.1    1600          dhcp-snooping  100  FastEthernet3/1
Switch#
```

This example shows how to display an IP address for DHCP snooping binding entries:
Switch# `show ip dhcp snooping binding 172.100.101.102`

<table>
<thead>
<tr>
<th>MacAddress</th>
<th>IP Address</th>
<th>Lease (seconds)</th>
<th>Type</th>
<th>VLAN</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000.0100.0201</td>
<td>172.100.101.102</td>
<td>1600</td>
<td>dhcp-snooping</td>
<td>100</td>
<td>FastEthernet3/1</td>
</tr>
</tbody>
</table>

Switch#
This example shows how to display the MAC address for the DHCP snooping binding entries:

```
Switch# show ip dhcp snooping binding 55.5.5.2 0002.b33f.3d5f
```

```
+-------------------+---------+-----------------+---------+---------+-------------------+
| MacAddress        | IPAddress| Lease (sec)     | Type    | VLAN   | Interface         |
+-------------------+---------+-----------------+---------+---------+-------------------+
| 00:02:B3:3F:3D:5F | 55.5.5.2 | 492             | dhcp-snooping | 99     | FastEthernet6/36  |
+-------------------+---------+-----------------+---------+---------+-------------------+
Switch#
```

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

```
Switch# show ip dhcp snooping binding 55.5.5.2 0002.b33f.3d5f vlan 99
```

```
+-------------------+---------+-----------------+---------+---------+-------------------+
| MacAddress        | IPAddress| Lease (sec)     | Type    | VLAN   | Interface         |
+-------------------+---------+-----------------+---------+---------+-------------------+
| 00:02:B3:3F:3D:5F | 55.5.5.2 | 479             | dhcp-snooping | 99     | FastEthernet6/36  |
+-------------------+---------+-----------------+---------+---------+-------------------+
Switch#
```

This example shows how to display the dynamic DHCP snooping binding entries:

```
Switch# show ip dhcp snooping binding dynamic
```

```
+------------------++-------------++----------------++---++-------------------+
| MacAddress       | IP Address  | Lease (seconds) | Type           | VLAN | Interface         |
+------------------++-------------++----------------++---++-------------------+
| 0000.0100.0201   | 10.0.0.1    | 1600            | dhcp-snooping  | 100  | FastEthernet3/1   |
+------------------++-------------++----------------++---++-------------------+
Switch#
```

This example shows how to display the DHCP snooping binding entries on VLAN 100:

```
Switch# show ip dhcp snooping binding vlan 100
```

```
+------------------++-------------++----------------++---++-------------------+
| MacAddress       | IP Address  | Lease (seconds) | Type           | VLAN | Interface         |
+------------------++-------------++----------------++---++-------------------+
| 0000.0100.0201   | 10.0.0.1    | 1600            | dhcp-snooping  | 100  | FastEthernet3/1   |
+------------------++-------------++----------------++---++-------------------+
Switch#
```

This example shows how to display the DHCP snooping binding entries on Ethernet interface 0/1:

```
Switch# show ip dhcp snooping binding interface fastethernet3/1
```

```
+------------------++-------------++----------------++---++-------------------+
| MacAddress       | IP Address  | Lease (seconds) | Type           | VLAN | Interface         |
+------------------++-------------++----------------++---++-------------------+
| 0000.0100.0201   | 10.0.0.1    | 1600            | dhcp-snooping  | 100  | FastEthernet3/1   |
+------------------++-------------++----------------++---++-------------------+
Switch#
```

**Table 2-27** describes the fields in the `show ip dhcp snooping` command output.

**Table 2-27 show ip dhcp snooping Command Output**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Address</td>
<td>Client hardware MAC address.</td>
</tr>
<tr>
<td>IP Address</td>
<td>Client IP address assigned from the DHCP server.</td>
</tr>
<tr>
<td>Lease (sec)</td>
<td>IP address lease time.</td>
</tr>
<tr>
<td>Type</td>
<td>Binding type; statically configured from CLI or dynamically learned.</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>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip dhcp snooping information option</code></td>
<td>Enables DHCP option 82 data insertion.</td>
</tr>
<tr>
<td><code>ip dhcp snooping limit rate</code></td>
<td>Configures the number of the DHCP messages that an interface can receive per second.</td>
</tr>
<tr>
<td><code>ip dhcp snooping trust</code></td>
<td>Enables DHCP snooping on a trusted VLAN.</td>
</tr>
<tr>
<td><code>ip dhcp snooping vlan</code></td>
<td>Enables DHCP snooping on a VLAN or a group of VLANs.</td>
</tr>
<tr>
<td><code>ip igmp snooping</code></td>
<td>Enables IGMP snooping.</td>
</tr>
<tr>
<td><code>ip igmp snooping vlan</code></td>
<td>Enables IGMP snooping for a VLAN.</td>
</tr>
</tbody>
</table>
**show ip dhcp snooping database**

To display the status of the DHCP snooping database agent, use the `show ip dhcp snooping database` command.

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>detail</td>
<td>(Optional) Provides additional operating state and statistics information.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(12c)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Added support of state and statistics information.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the DHCP snooping database:

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

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

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

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

Switch#
```
This example shows how to view additional operating statistics:

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

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

Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ip dhcp snooping</strong></td>
<td>Globally enables DHCP snooping.</td>
</tr>
<tr>
<td><strong>ip dhcp snooping database</strong></td>
<td>Stores the bindings that are generated by DHCP snooping.</td>
</tr>
<tr>
<td><strong>ip dhcp snooping information option</strong></td>
<td>Enables DHCP option 82 data insertion.</td>
</tr>
<tr>
<td><strong>ip dhcp snooping limit rate</strong></td>
<td>Configures the number of the DHCP messages that an interface can receive per second.</td>
</tr>
<tr>
<td><strong>ip dhcp snooping trust</strong></td>
<td>Enables DHCP snooping on a trusted VLAN.</td>
</tr>
<tr>
<td><strong>ip dhcp snooping vlan</strong></td>
<td>Enables DHCP snooping on a VLAN or a group of VLANs.</td>
</tr>
</tbody>
</table>
show ip igmp interface

To view IP IGMP interface status and configuration information, use the `show ip igmp interface` command.

```
show ip igmp interface [fastethernet slot/port | gigabitethernet slot/port |
         tengigabitethernet slot/port | null interface-number | vlan vlan_id]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fastethernet slot/port</td>
<td>(Optional) Specifies the Fast Ethernet interface and the number of the slot and port.</td>
</tr>
<tr>
<td>gigabitethernet slot/port</td>
<td>(Optional) Specifies the Gigabit Ethernet interface and the number of the slot and port; valid values are from 1 to 9.</td>
</tr>
<tr>
<td>tengigabitethernet slot/port</td>
<td>(Optional) Specifies the 10-Gigabit Ethernet interface and the number of the slot and port; valid values are from 1 to 2.</td>
</tr>
<tr>
<td>null interface-number</td>
<td>(Optional) Specifies the null interface and the number of the interface; the only valid value is 0.</td>
</tr>
<tr>
<td>vlan vlan_id</td>
<td>(Optional) Specifies the VLAN and the number of the VLAN; valid values are from 1 to 4094.</td>
</tr>
</tbody>
</table>

**Defaults**

If you do not specify a VLAN, information for VLAN 1 is shown.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If you omit the optional arguments, the `show ip igmp interface` command displays information about all interfaces.

**Examples**

This example shows how to view IGMP information for VLAN 200:

```
Switch# show ip igmp interface vlan 200
IGMP snooping is globally enabled
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 is running in IGMP-ONLY mode on this VLAN
Switch#
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear ip igmp group</td>
<td>Deletes the IGMP group cache entries.</td>
</tr>
<tr>
<td>show ip igmp snooping mrouter</td>
<td>Displays information on the dynamically learned and manually configured multicast switch interfaces.</td>
</tr>
</tbody>
</table>
# show ip igmp profile

To view all configured IGMP profiles or a specified IGMP profile, use the `show ip igmp profile` privileged EXEC command.

```
show ip igmp profile [profile number]
```

## Syntax Description

| profile number | (Optional) IGMP profile number to be displayed; valid ranges are from 1 to 4294967295. |

## Defaults

This command has no default settings.

## Command Modes

Privileged EXEC mode

## Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(11b)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

## Usage Guidelines

If no profile number is entered, all IGMP profiles are displayed.

## Examples

This example shows how to display IGMP profile 40:

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

This example shows how to display all IGMP profiles:

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

## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip igmp profile</code></td>
<td>Creates an IGMP profile.</td>
</tr>
</tbody>
</table>
show ip igmp snooping

To display information on dynamically learned and manually configured VLAN switch interfaces, use the `show ip igmp snooping` command.

```
show ip igmp snooping [querier | groups | mrouter] [vlan vlan_id] a.b.c.d [summary | sources | hosts] [count]
```

### Syntax Description

- **querier**: (Optional) Specifies that the display will contain IP address and version information.
- **groups**: (Optional) Specifies that the display will list VLAN members sorted by group IP addresses.
- **mrouter**: (Optional) Specifies that the display will contain information on dynamically learned and manually configured multicast switch interfaces.
- **vlan vlan_id**: (Optional) Specifies a VLAN; valid values are from 1 to 1001 and from 1006 to 4094.
- **a.b.c.d**: Group or multicast IP address.
- **summary**: (Optional) Specifies a display of detailed information for a v2 or v3 group.
- **sources**: (Optional) Specifies a list of the source IPs for the specified group.
- **hosts**: (Optional) Specifies a list of the host IPs for the specified group.
- **count**: (Optional) Specifies a display of the total number of group addresses learned by the system on a global or per-VLAN basis.

### Defaults

This command has no default settings.

### Command Modes

EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Support for extended addressing was added.</td>
</tr>
<tr>
<td>12.1(20)EW</td>
<td>Added support to display configuration state for IGMPv3 explicit host tracking.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

You can also use the `show mac-address-table multicast` command to display the entries in the MAC address table for a VLAN that has IGMP snooping enabled.

You can display IGMP snooping information for VLAN interfaces by entering the `show ip igmp snooping` command.
Examples

This example shows how to display the global snooping information on the switch:

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

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

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

This example shows how to display the snooping information on VLAN 2:

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

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

This example shows how to display IGMP querier information for all VLANs on a switch:

```
Switch# show ip igmp snooping querier
Vlan  IP Address     IGMP Version   Port
-------------------------------
  2    10.10.10.1       v2           Router
  3    172.20.50.22     v3           Fa3/15
```

Note: The examples provided are for illustrative purposes only and may not reflect the exact output you would see on your switch.
This example shows how to display IGMP querier information for VLAN 5 when running IGMPv2:

Switch# show ip igmp snooping querier vlan 5
IP address : 5.5.5.10
IGMP version : v2
Port : Fa3/1
Max response time : 10s
Switch>

This example shows how to display IGMP querier information for VLAN 5 when running IGMPv3:

Switch# show ip igmp snooping querier vlan 5
IP address : 5.5.5.10
IGMP version : v3
Port : Fa3/1
Max response time : 10s
Query interval : 60s
Robustness variable : 2
Switch>

This example shows how to display snooping information for a specific group:

Switch# show ip igmp snooping group

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Group</th>
<th>Version</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>224.0.1.40</td>
<td>v3</td>
<td>Router</td>
</tr>
<tr>
<td>2</td>
<td>224.2.2.2</td>
<td>v3</td>
<td>Fa6/2</td>
</tr>
</tbody>
</table>

Switch>

This example shows how to display the group’s host types and ports in VLAN 1:

Switch# show ip igmp snooping group vlan 1

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Group</th>
<th>Host Type</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>229.2.3.4</td>
<td>v3</td>
<td>fa2/1, fa2/3</td>
</tr>
<tr>
<td>1</td>
<td>224.2.2.2</td>
<td>v3</td>
<td>Fa6/2</td>
</tr>
</tbody>
</table>

Switch>

This example shows how to display the group’s host types and ports in VLAN 1:

Switch# show ip igmp snooping group vlan 10 226.6.6.7

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Group</th>
<th>Version</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>226.6.6.7</td>
<td>v3</td>
<td>Fa7/13, Fa7/14</td>
</tr>
</tbody>
</table>

Switch>

This example shows how to display the current state of a group with respect to a source IP address:

Switch# show ip igmp snooping group vlan 10 226.6.6.7 sources

Source information for group 226.6.6.7:
Timers: Expired sources are deleted on next IGMP General Query

<table>
<thead>
<tr>
<th>SourceIP</th>
<th>Expires</th>
<th>Uptime</th>
<th>Inc Hosts</th>
<th>Exc Hosts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0.0.1</td>
<td>00:03:04</td>
<td>00:03:48</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2.0.0.2</td>
<td>00:03:04</td>
<td>00:02:07</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Switch>
This example shows how to display the current state of a group with respect to a host MAC address:

```
Switch# show ip igmp snooping group vlan 10 226.6.6.7 hosts
IGMPv3 host information for group 226.6.6.7
Timers: Expired hosts are deleted on next IGMP General Query

<table>
<thead>
<tr>
<th>Host (MAC/IP)</th>
<th>Filter mode</th>
<th>Expires</th>
<th>Uptime</th>
<th># Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>175.1.0.29</td>
<td>INCLUDE</td>
<td>stopped</td>
<td>00:00:51</td>
<td>2</td>
</tr>
<tr>
<td>175.2.0.30</td>
<td>INCLUDE</td>
<td>stopped</td>
<td>00:04:14</td>
<td>2</td>
</tr>
</tbody>
</table>
```

Switch>

This example shows how to display summary information for a v3 group:

```
Switch# show ip igmp snooping group vlan 10 226.6.6.7 summary
Group Address (Vlan 10) : 226.6.6.7
Host type             : v3
Member Ports          : Fa7/13, Fa7/14
Filter mode           : INCLUDE
Expires               : stopped
Sources               : 2
Reporters (Include/Exclude) : 2/0
```

Switch>

This example shows how to display multicast router information for VLAN 1:

```
Switch# show ip igmp snooping mrouter vlan 1
vlan         ports
-------------+----------------------------------------
1            Gi1/1,Gi2/1,Fa3/48,Router
```

Switch#

This example shows how to display the total number of group addresses learned by the system globally:

```
Switch# show ip igmp snooping group count
Total number of groups:  54
```

Switch>

This example shows how to display the total number of group addresses learned on VLAN 5:

```
Switch# show ip igmp snooping group vlan 5 count
Total number of groups:  30
```

Switch>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip igmp snooping</td>
<td>Enable IGMP snooping.</td>
</tr>
<tr>
<td>ip igmp snooping vlan immediate-leave</td>
<td>Enable IGMP immediate-leave processing.</td>
</tr>
<tr>
<td>ip igmp snooping vlan mrouter</td>
<td>Configures a Layer 2 interface as a multicast router interface for a VLAN.</td>
</tr>
<tr>
<td>ip igmp snooping vlan static</td>
<td>Configures a Layer 2 interface as a member of a group.</td>
</tr>
<tr>
<td>show ip igmp interface</td>
<td>Displays the information about the IGMP-interface status and configuration.</td>
</tr>
<tr>
<td>show ip igmp snooping mrouter</td>
<td>Displays information on the dynamically learned and manually configured multicast switch interfaces.</td>
</tr>
<tr>
<td>show mac-address-table multicast</td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
</tbody>
</table>
show ip igmp snooping membership

To display host membership information, use the show ip igmp snooping membership command.

```
show ip igmp snooping membership [interface interface_num] [vlan vlan_id] [reporter a.b.c.d] [source a.b.c.d group a.b.c.d]
```

**Syntax Description**

- `interface interface_num` (Optional) Displays IP address and version information of an interface.
- `vlan vlan_id` (Optional) Displays VLAN members sorted by group IP address of a VLAN; valid values are from 1 to 1001 and from 1006 to 4094.
- `reporter a.b.c.d` (Optional) Displays membership information for a specified reporter.
- `source a.b.c.d` (Optional) Specifies a reporter, source, or group IP address.
- `group a.b.c.d` (Optional) Displays all members of a channel (source, group), sorted by interface or VLAN.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

- **12.1(20)EW** Support for this command was introduced on the Catalyst 4500 series switch.
- **12.2(25)EW** Added support for the 10-Gigabit Ethernet interface.

**Usage Guidelines**

This command is valid only if explicit host tracking is enabled on the switch.

**Examples**

This example shows how to display host membership for the Gigabit Ethernet interface 4/1:

```
Switch# show ip igmp snooping membership interface gigabitethernet4/1
#channels: 5
#hosts : 1
Source/Group Interface Reporter Uptime Last-Join Last-Leave
40.40.40.2/224.10.10.10 Gi4/1 20.20.20.20 00:23:37 00:06:50 00:20:30
40.40.40.4/224.10.10.10Gi4/1 20.20.20.20 00:39:42 00:09:17 -
Switch#
```

This example shows how to display host membership for VLAN 20 and group 224.10.10.10:

```
Switch# show ip igmp snooping membership vlan 20 source 40.40.40.2 group 224.10.10.10
#channels: 5
#hosts : 1
Source/Group Interface Reporter Uptime Last-Join Last-Leave
40.40.40.2/224.10.10.10 Gi4/1 20.20.20.20 00:23:37 00:06:50 00:20:30
Switch#
```
This example shows how to display host membership information for VLAN 20 and to delete the explicit host tracking:

Switch# **show ip igmp snooping membership vlan 20**
Snooping Membership Summary for Vlan 20
------------------------------------------
Total number of channels:5
Total number of hosts :4

<table>
<thead>
<tr>
<th>Source/Group</th>
<th>Interface</th>
<th>Reporter</th>
<th>Uptime</th>
<th>Last-Join/Last-Leave</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.0.0.1/224.1.1.1</td>
<td>Fa7/37</td>
<td>0002.4ba0.a4f6</td>
<td>00:00:04</td>
<td>00:00:04 /</td>
</tr>
<tr>
<td>40.0.0.2/224.1.1.1</td>
<td>Fa7/37</td>
<td>0002.fd80.f770</td>
<td>00:00:17</td>
<td>00:00:17 /</td>
</tr>
<tr>
<td>40.0.0.3/224.1.1.1</td>
<td>Fa7/36</td>
<td>20.20.20.20</td>
<td>00:00:04</td>
<td>00:00:04 /</td>
</tr>
<tr>
<td>40.0.0.4/224.1.1.1</td>
<td>Fa7/35</td>
<td>20.20.20.210</td>
<td>00:00:17</td>
<td>00:00:17 /</td>
</tr>
<tr>
<td>40.0.0.5/224.1.1.1</td>
<td>Fa7/37</td>
<td>0002.fd80.f770</td>
<td>00:00:17</td>
<td>00:00:17 /</td>
</tr>
</tbody>
</table>

Switch# **clear ip igmp snooping membership vlan 20**

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear ip igmp snooping membership</td>
<td>Clears the explicit host tracking database.</td>
</tr>
<tr>
<td>ip igmp snooping vlan explicit-tracking</td>
<td>Enables per-VLAN explicit host tracking.</td>
</tr>
<tr>
<td>show ip igmp snooping</td>
<td>Displays information on dynamically learned and manually configured VLAN switch interfaces.</td>
</tr>
</tbody>
</table>
show ip igmp snooping mrouter

To display information on the dynamically learned and manually configured multicast switch interfaces, use the `show ip igmp snooping mrouter` command.

`show ip igmp snooping mrouter [vlan vlan-id]`

Syntax Description

- `vlan vlan-id` (Optional) Specifies a VLAN; valid values are from 1 to 1001 and from 1006 to 4094.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
</tbody>
</table>

Usage Guidelines

You can also use the `show mac-address-table multicast` command to display entries in the MAC address table for a VLAN that has IGMP snooping enabled.

You can display IGMP snooping information for the VLAN interfaces by entering the `show ip igmp interface vlan vlan-num` command.

Examples

This example shows how to display snooping information for a specific VLAN:

```
Switch# show ip igmp snooping mrouter vlan 1
vlan            ports
-----+----------------------------------------
1    Gi1/1,Gi2/1,Fa3/48,Switch
```

Switch#

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip igmp snooping vlan mrouter</code></td>
<td>Statically configures a Layer 2 interface as a multicast router interface for a VLAN.</td>
</tr>
<tr>
<td><code>show ip igmp interface</code></td>
<td>Displays the information about the IGMP-interface status and configuration.</td>
</tr>
<tr>
<td><code>show mac-address-table multicast</code></td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
</tbody>
</table>
show ip igmp snooping vlan

To display information on the dynamically learned and manually configured VLAN switch interfaces, use the show ip igmp snooping vlan command.

```
show ip igmp snooping vlan vlan_num
```

**Syntax Description**

- `vlan_num`: Number of the VLAN; valid values are from 1 to 1001 and from 1006 to 4094.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Support for extended addressing was added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

You can also use the show mac-address-table multicast command to display the entries in the MAC address table for a VLAN that has IGMP snooping enabled.

**Examples**

This example shows how to display snooping information for a specific VLAN:

```
Switch# show ip igmp snooping vlan 2
vlan 2
--------
IGMP snooping is globally enabled
IGMP snooping TCN solicit query is globally enabled
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 is running in IGMP_ONLY mode on this Vlan
Switch#
```
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip igmp snooping</code></td>
<td>Enable IGMP snooping.</td>
</tr>
<tr>
<td><code>ip igmp snooping vlan immediate-leave</code></td>
<td>Enable IGMP immediate-leave processing.</td>
</tr>
<tr>
<td><code>ip igmp snooping vlan mrouter</code></td>
<td>Statically configures a Layer 2 interface as a multicast</td>
</tr>
<tr>
<td></td>
<td>router interface for a VLAN.</td>
</tr>
<tr>
<td><code>ip igmp snooping vlan static</code></td>
<td>Configures a Layer 2 interface as a member of a group.</td>
</tr>
<tr>
<td><code>show ip igmp interface</code></td>
<td>Displays the information about the IGMP-interface status</td>
</tr>
<tr>
<td></td>
<td>and configuration.</td>
</tr>
<tr>
<td><code>show ip igmp snooping mrouter</code></td>
<td>Displays information on the dynamically learned and</td>
</tr>
<tr>
<td></td>
<td>manually configured multicast switch interfaces.</td>
</tr>
<tr>
<td><code>show mac-address-table multicast</code></td>
<td>Displays information about the multicast MAC address</td>
</tr>
<tr>
<td></td>
<td>table.</td>
</tr>
</tbody>
</table>
**show ip interface**

To display the usability status of interfaces that are configured for IP, use the `show ip interface` command.

```
show ip interface [type number]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>(Optional) Interface type.</td>
</tr>
<tr>
<td>number</td>
<td>(Optional) Interface number.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(25)EW</td>
<td>Extended to include the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The Cisco IOS software automatically enters a directly connected route in the routing table if the interface is usable. A usable interface is one through which the software can send and receive packets. If the software determines that an interface is not usable, it removes the directly connected routing entry from the routing table. Removing the entry allows the software to use dynamic routing protocols to determine backup routes to the network, if any.

If the interface can provide two-way communication, the line protocol is marked “up.” If the interface hardware is usable, the interface is marked “up.”

If you specify an optional interface type, you see information only on that specific interface.

If you specify no optional arguments, you see information on all the interfaces.

When an asynchronous interface is encapsulated with PPP or Serial Line Internet Protocol (SLIP), IP fast switching is enabled. The `show ip interface` command on an asynchronous interface that is encapsulated with PPP or SLIP displays a message indicating that IP fast switching is enabled.

**Examples**

This example shows how to display the usability status for a specific VLAN:

```
Switch# show ip interface vlan 1
Vlan1 is up, line protocol is up
    Internet address is 10.6.58.4/24
    Broadcast address is 255.255.255.255
    Address determined by non-volatile memory
    MTU is 1500 bytes
    Helper address is not set
    Directed broadcast forwarding is disabled
    Outgoing access list is not set
    Inbound access list is not set
    Proxy ARP is enabled
```
Local Proxy ARP is disabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is enabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP CEF switching is enabled
IP Fast switching turbo vector
IP Normal CEF switching turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, CEF
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled
Sampled Netflow is disabled
IP multicast multilayer switching is disabled
Netflow Data Export (hardware) is enabled
Switch#

Table 2-28 describes the fields that are shown in the example.

Table 2-28  show ip interface Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet0 is up</td>
<td>If the interface hardware is usable, the interface is marked “up.” For an interface to be usable, both the interface hardware and line protocol must be up.</td>
</tr>
<tr>
<td>line protocol is up</td>
<td>If the interface can provide two-way communication, the line protocol is marked “up.” For an interface to be usable, both the interface hardware and line protocol must be up.</td>
</tr>
<tr>
<td>Internet address and subnet mask</td>
<td>IP address and subnet mask of the interface.</td>
</tr>
<tr>
<td>Broadcast address</td>
<td>Broadcast address.</td>
</tr>
<tr>
<td>Address determined by...</td>
<td>Status of how the IP address of the interface was determined.</td>
</tr>
<tr>
<td>MTU</td>
<td>MTU value that is set on the interface.</td>
</tr>
<tr>
<td>Helper address</td>
<td>Helper address, if one has been set.</td>
</tr>
<tr>
<td>Secondary address</td>
<td>Secondary address, if one has been set.</td>
</tr>
<tr>
<td>Directed broadcast forwarding</td>
<td>Status of directed broadcast forwarding.</td>
</tr>
<tr>
<td>Multicast groups joined</td>
<td>Multicast groups to which this interface belongs.</td>
</tr>
<tr>
<td>Outgoing access list</td>
<td>Status of whether the interface has an outgoing access list set.</td>
</tr>
<tr>
<td>Inbound access list</td>
<td>Status of whether the interface has an incoming access list set.</td>
</tr>
</tbody>
</table>
### Table 2-28  `show ip interface` Field Descriptions (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proxy ARP</td>
<td>Status of whether Proxy Address Resolution Protocol (ARP) is enabled for the interface.</td>
</tr>
<tr>
<td>Security level</td>
<td>IP Security Option (IPSO) security level set for this interface. Adamit of split horizon.</td>
</tr>
<tr>
<td>Split horizon</td>
<td>Status of split horizon.</td>
</tr>
<tr>
<td>ICMP redirects</td>
<td>Status of the redirect messages on this interface.</td>
</tr>
<tr>
<td>ICMP unreachables</td>
<td>Status of the unreachable messages on this interface.</td>
</tr>
<tr>
<td>ICMP mask replies</td>
<td>Status of the mask replies on this interface.</td>
</tr>
<tr>
<td>IP fast switching</td>
<td>Status of whether fast switching has been enabled for this interface. Fast switching is typically enabled on serial interfaces, such as this one.</td>
</tr>
<tr>
<td>IP SSE switching</td>
<td>Status of the IP silicon switching engine (SSE).</td>
</tr>
<tr>
<td>Router Discovery</td>
<td>Status of the discovery process for this interface. It is typically disabled on serial interfaces.</td>
</tr>
<tr>
<td>IP output packet accounting</td>
<td>Status of IP accounting for this interface and the threshold (maximum number of entries).</td>
</tr>
<tr>
<td>TCP/IP header compression</td>
<td>Status of compression.</td>
</tr>
<tr>
<td>Probe proxy name</td>
<td>Status of whether the HP Probe proxy name replies are generated. Adamit of whether packets that are received on an interface are redirected to a cache engine.</td>
</tr>
<tr>
<td>WCCP Redirect outbound is enabled</td>
<td>Status of whether packets that are received on an interface are redirected to a cache engine.</td>
</tr>
<tr>
<td>WCCP Redirect exclude is disabled</td>
<td>Status of whether packets that are targeted for an interface are excluded from being redirected to a cache engine.</td>
</tr>
<tr>
<td>Netflow Data Export (hardware) is enabled</td>
<td>NDE hardware flow status on the interface.</td>
</tr>
</tbody>
</table>
show ip mfib

To display all active Multicast Forwarding Information Base (MFIB) routes, use the **show ip mfib** command.

```
show ip mfib [all | counters | log [n]]
```

**Syntax Description**

- `all` (Optional) Specifies all routes in the MFIB, including those routes that are used to accelerate fast switching but that are not necessarily in the upper-layer routing protocol table.

- `counters` (Optional) Specifies the counts of MFIB-related events. Only nonzero counters are shown.

- `log` (Optional) Specifies a log of the most recent number of MFIB-related events. The most recent event is first.

- `n` (Optional) Number of events.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(40)SG</td>
<td>Support for command introduced on the Supervisor Engine 6-E and Catalyst 4900M chassis.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

In the Supervisor Engine 6-E and Catalyst 4900M chassis, the output of the **show ip mfib** command does not display any hardware counters.

The MFIB table contains a set of IP multicast routes; each route in the MFIB table contains several flags that associate to the route.

The route flags indicate how a packet that matches a route is forwarded. For example, the IC flag on an MFIB route indicates that some process on the switch needs to receive a copy of the packet. These flags are associated with MFIB routes:

- **Internal Copy (IC) flag**—Set on a route when a process on the switch needs to receive a copy of all packets matching the specified route.

- **Signaling (S) flag**—Set on a route when a switch process needs notification that a packet matching the route is received. In the expected behavior, the protocol code updates the MFIB state in response to having received a packet on a signaling interface.

- **Connected (C) flag**—When set on a route, the C flag has the same meaning as the S flag, except that the C flag indicates that only packets sent by directly connected hosts to the route should be signaled to a protocol process.
A route can also have a set of flags associated with one or more interfaces. For an (S,G) route, the flags on interface 1 indicate how the ingress packets should be treated and whether packets matching the route should be forwarded onto interface 1. These per-interface flags are associated with the MFIB routes:

- **Accepting (A)**—Set on the RPF interface when a packet that arrives on the interface and that is marked as Accepting (A) is forwarded to all Forwarding (F) interfaces.
- **Forwarding (F)**—Used with the A flag as described above. The set of forwarding interfaces together form a multicast output or output interface list.
- **Signaling (S)**—Set on an interface when a multicast routing protocol process in Cisco IOS needs to be notified of ingress packets on that interface.
- **Not Platform (NP) fast-switched**—Used with the F flag. A forwarding interface is also marked as Not Platform fast-switched whenever that output interface cannot be fast-switched by the platform hardware and requires software forwarding.

For example, the Catalyst 4506 switch with Supervisor Engine III cannot switch tunnel interfaces in hardware so these interfaces are marked with the NP flag. When an NP interface is associated with a route, a copy of every ingress packet arriving on an Accepting interface is sent to the switch software forwarding path for software replication and then forwarded to the NP interface.

### Examples

This example shows how to display all active MFIB routes:

```
Switch# show ip mfib
IP Multicast Forwarding Information Base
Entry Flags: C - Directly Connected, S - Signal,
            IC - Internal Copy
Interface Flags: A - Accept, F - Forward, NS - Signal,
                NP - Not platform switched
Packets: Fast/Partial/Slow Bytes: Fast/Partial/Slow:
(171.69.10.13, 224.0.1.40), flags (IC)
Packets: 2292/2292/0, Bytes: 518803/0/518803
    Vlan7 (A)
    Vlan100 (F NS)
    Vlan105 (F NS)
(*, 224.0.1.60), flags ()
Packets: 2292/0/0, Bytes: 518803/0/0
    Vlan7 (A NS)
(*, 224.0.1.75), flags ()
    Vlan7 (A NS)
(10.34.2.92, 239.192.128.80), flags ()
Packets: 24579/100/0, 21113788/15000/0 bytes
    Vlan7 (F NS)
    Vlan100 (A)
(*, 239.193.100.70), flags ()
Packets: 1/0/0, 1500/0/0 bytes
    Vlan7 (A)
Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear ip mfib counters</td>
<td>Clears the global MFIB counters and the counters for all active MFIB routes.</td>
</tr>
</tbody>
</table>
show ip mfib fastdrop

To display all currently active fast-drop entries and to show whether fast drop is enabled, use the `show ip mfib fastdrop` command.

```
show ip mfib fastdrop
```

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

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**
This example shows how to display all currently active fast-drop entries and whether fast drop is enabled.

```
Switch# show ip mfib fastdrop
MFIB fastdrop is enabled.
MFIB fast-dropped flows:
(10.0.0.1, 224.1.2.3, Vlan9 ) 00:01:32
(10.1.0.2, 224.1.2.3, Vlan9 ) 00:02:30
(1.2.3.4, 225.6.7.8, Vlan3) 00:01:50
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear ip mfib fastdrop</td>
<td>Clears all the MFIB fast-drop entries.</td>
</tr>
</tbody>
</table>
show ip mroute

To display IP multicast routing table information, use the `show ip mroute` command.

```
show ip mroute [interface_type slot/port | host_name | host_address [source] | active [kbps | interface_type num] | count | pruned | static | summary]
```

**Syntax Description**

- **interface_type slot/port** (Optional) Interface type and number of the slot and port; valid values for `interface_type` are `fastethernet`, `gigabitethernet`, `tengigabitethernet`, `null`, and `vlan`.
- **host_name** (Optional) Name or IP address as defined in the DNS hosts table.
- **host_address source** (Optional) IP address or name of a multicast source.
- **active** (Optional) Displays the rate that active sources are sending to multicast groups.
- **kbps** (Optional) Minimum rate at which active sources are sending to multicast groups; active sources sending at this rate or greater will be displayed. Valid values are from 1 to 4294967295 kbps.
- **interface_type num** (Optional) Interface type and number of the slot and port; valid values for `interface_type` are `fastethernet`, `gigabitethernet`, `tengigabitethernet`, `null`, and `vlan`.
- **count** (Optional) Displays the route and packet count information.
- **pruned** (Optional) Displays the pruned routes.
- **static** (Optional) Displays the static multicast routes.
- **summary** (Optional) Displays a one-line, abbreviated summary of each entry in the IP multicast routing table.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If you omit all the optional arguments and keywords, the `show ip mroute` command displays all the entries in the IP multicast routing table.

The `show ip mroute active kbps` command displays all the sources sending at a rate greater than or equal to `kbps`.

The multicast routing table is populated by creating source, group (S,G) entries from star, group (*,G) entries. The star refers to all source addresses, the “S” refers to a single source address, and the “G” refers to the destination multicast group address. In creating (S,G) entries, the software uses the best path to that destination group found in the unicast routing table (through Reverse Path Forwarding (RPF)).
**Examples**

This example shows how to display all the entries in the IP multicast routing table:

Switch# `show ip mroute`

IP Multicast Routing Table
Flags:D - Dense, S - Sparse, s - SSM Group, C - Connected, L - Local,
P - Pruned, R - RP-bit set, F - Register flag, T - SPT-bit set,
J - Join SPT, M - MSDP created entry, X - Proxy Join Timer Running
A - Advertised via MSDP, U - URD, I - Received Source Specific Host Report
Outgoing interface flags:H - Hardware switched
Timers:Uptime/Expires
Interface state:Interface, Next-Hop or VCD, State/Mode

(*, 230.13.13.1), 00:16:41/00:00:00, RP 10.15.1.20, flags:SJC
Incoming interface:GigabitEthernet4/8, RPF nbr 10.15.1.20
Outgoing interface list:
GigabitEthernet4/9, Forward/Sparse-Dense, 00:16:41/00:00:00, H

(*, 230.13.13.2), 00:16:41/00:00:00, RP 10.15.1.20, flags:SJC
Incoming interface:GigabitEthernet4/8, RPF nbr 10.15.1.20, RPF-MFD
Outgoing interface list:
GigabitEthernet4/9, Forward/Sparse-Dense, 00:16:41/00:00:00, H

(10.20.1.15, 230.13.13.1), 00:14:31/00:01:40, flags:CJT
Incoming interface:GigabitEthernet4/8, RPF nbr 10.15.1.20, RPF-MFD
Outgoing interface list:
GigabitEthernet4/9, Forward/Sparse-Dense, 00:14:31/00:00:00, H

This example shows how to display the rate that the active sources are sending to the multicast groups and to display only the active sources that are sending at greater than the default rate:

Switch# `show ip mroute active`

Active IP Multicast Sources - sending >= 4 kbps

Group: 224.2.127.254, (sdn.cisco.com)
Source: 146.137.28.69 (mbone.ipd.anl.gov)
Rate: 1 pps/4 kbps(1sec), 4 kbps(last 1 secs), 4 kbps(life avg)

Group: 224.2.201.241, ACM 97
Source: 130.129.52.160 (webcast3-e1.acm97.interop.net)
Rate: 9 pps/93 kbps(1sec), 145 kbps(last 20 secs), 85 kbps(life avg)

Group: 224.2.207.215, ACM 97
Source: 130.129.52.160 (webcast3-e1.acm97.interop.net)
Rate: 3 pps/31 kbps(1sec), 63 kbps(last 19 secs), 65 kbps(life avg)

Switch#
This example shows how to display route and packet count information:

Switch# **show ip mroute count**

IP Multicast Statistics
56 routes using 28552 bytes of memory
13 groups, 3.30 average sources per group
Forwarding Counts: Pkt Count/Pkts per second/Avg Pkt Size/Kilobits per second

Other counts: Total/RPF failed/Other drops (OIF-null, rate-limit etc)

Group: 224.2.136.89, Source count: 1, Group pkt count: 29051
Source: 132.206.72.28/32, Forwarding: 29051/-278/1186/0, Other: 85724/8/56665

Switch#

This example shows how to display summary information:

Switch# **show ip mroute summary**

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, s - SSM Group, C - Connected, L - Local,
P - Pruned, R - Rp-bit set, F - Register flag, T - SPT-bit set,
J - Join SPT, M - MSDP created entry, X - Proxy Join Timer Running
A - Advertised via MSDP, U - URD, I - Received Source Specific Host Report

Outgoing interface flags: H - Hardware switched
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

Switch#

**Table 2-29** describes the fields shown in the output.

**Table 2-29** — show ip mroute Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flags:</td>
<td>Information about the entry.</td>
</tr>
<tr>
<td>D - Dense</td>
<td>Entry is operating in dense mode.</td>
</tr>
<tr>
<td>S - Sparse</td>
<td>Entry is operating in sparse mode.</td>
</tr>
<tr>
<td>s - SSM Group</td>
<td>Entry is a member of an SSM group.</td>
</tr>
<tr>
<td>C - Connected</td>
<td>Member of the multicast group is present on the directly connected interface.</td>
</tr>
<tr>
<td>L - Local</td>
<td>Switch is a member of the multicast group.</td>
</tr>
<tr>
<td>P - Pruned</td>
<td>Route has been pruned. This information is retained in case a downstream member wants to join the source.</td>
</tr>
<tr>
<td>R - Rp-bit set</td>
<td>Status of the (S,G) entry; is the (S,G) entry pointing toward the RP. The R - Rp-bit set is typically a prune state along the shared tree for a particular source.</td>
</tr>
<tr>
<td>F - Register flag</td>
<td>Status of the software; indicates if the software is registered for a multicast source.</td>
</tr>
<tr>
<td>T - SPT-bit set</td>
<td>Status of the packets; indicates if the packets been received on the shortest path source tree.</td>
</tr>
</tbody>
</table>
Table 2-29  show ip mroute Field Descriptions (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J - Join SPT</td>
<td>For (<em>, G) entries, indicates that the rate of traffic flowing down the shared tree is exceeding the SPT-Threshold set for the group. (The default SPT-Threshold setting is 0 kbps.) When the J - Join SPT flag is set, the next (S,G) packet received down the shared tree triggers an (S,G) join in the direction of the source causing the switch to join the source tree. For (S, G) entries, indicates that the entry was created because the SPT-Threshold for the group was exceeded. When the J - Join SPT flag is set for (S,G) entries, the switch monitors the traffic rate on the source tree and attempts to switch back to the shared tree for this source if the traffic rate on the source tree falls below the group’s SPT-Threshold for more than one minute. The switch measures the traffic rate on the shared tree and compares the measured rate to the group’s SPT-Threshold once every second. If the traffic rate exceeds the SPT-Threshold, the J- Join SPT flag is set on the (</em>, G) entry until the next measurement of the traffic rate. The flag is cleared when the next packet arrives on the shared tree and a new measurement interval is started. If the default SPT-Threshold value of 0 Kbps is used for the group, the J- Join SPT flag is always set on (*, G) entries and is never cleared. When the default SPT-Threshold value is used, the switch immediately switches to the shortest-path tree when traffic from a new source is received.</td>
</tr>
</tbody>
</table>

Outgoing interface flag: Information about the outgoing entry. H - Hardware switched Entry is hardware switched. Timer: Uptime/Expires. Interface state: Interface, Next-Hop or VCD, State/Mode. (*, 224.0.255.1) (198.92.37.100/32, 224.0.255.1) Entry in the IP multicast routing table. The entry consists of the IP address of the source switch followed by the IP address of the multicast group. An asterisk (*) in place of the source switch indicates all sources. Entries in the first format are referred to as (*,G) or “star comma G” entries. Entries in the second format are referred to as (S,G) or “S comma G” entries. (*,G) entries are used to build (S,G) entries. uptime How long (in hours, minutes, and seconds) the entry has been in the IP multicast routing table. expires How long (in hours, minutes, and seconds) until the entry is removed from the IP multicast routing table on the outgoing interface.
Table 2-29  show ip mroute Field Descriptions (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP</td>
<td>Address of the RP switch. For switches and access servers operating in sparse mode, this address is always 0.0.0.0.</td>
</tr>
<tr>
<td>flags:</td>
<td>Information about the entry.</td>
</tr>
<tr>
<td>Incoming interface</td>
<td>Expected interface for a multicast packet from the source. If the packet is not received on this interface, it is discarded.</td>
</tr>
<tr>
<td>RPF neighbor</td>
<td>IP address of the upstream switch to the source. “Tunneling” indicates that this switch is sending data to the RP encapsulated in Register packets. The hexadecimal number in parentheses indicates to which RP it is registering. Each bit indicates a different RP if multiple RPs per group are used.</td>
</tr>
<tr>
<td>DVMRP or Mroute</td>
<td>Status of whether the RPF information is obtained from the DVMRP routing table or the static mroutes configuration.</td>
</tr>
<tr>
<td>Outgoing interface list</td>
<td>Interfaces through which packets are forwarded. When the <code>ip pim nbma-mode</code> command is enabled on the interface, the IP address of the PIM neighbor is also displayed.</td>
</tr>
<tr>
<td>Ethernet0</td>
<td>Name and number of the outgoing interface.</td>
</tr>
<tr>
<td>Next hop or VCD</td>
<td>Next hop specifies downstream neighbor’s IP address. VCD specifies the virtual circuit descriptor number. VCD0 indicates that the group is using the static-map virtual circuit.</td>
</tr>
<tr>
<td>Forward/Dense</td>
<td>Status of the packets; indicates if they are they forwarded on the interface if there are no restrictions due to access lists or the TTL threshold. Following the slash (/), mode in which the interface is operating (dense or sparse).</td>
</tr>
<tr>
<td>Forward/Sparse</td>
<td>Sparse mode interface is in forward mode.</td>
</tr>
<tr>
<td>time/time</td>
<td>Per interface, how long (in hours, minutes, and seconds) the entry has been in the IP multicast routing table. Following the slash (/), how long (in hours, minutes, and seconds) until the entry is removed from the IP multicast routing table.</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip multicast-routing</code></td>
<td>(refer to Cisco IOS documentation) Enables IP multicast routing.</td>
</tr>
<tr>
<td><code>ip pim</code></td>
<td>(refer to Cisco IOS documentation) Enables Protocol Independent Multicast (PIM) on an interface.</td>
</tr>
</tbody>
</table>
show ip source binding

To display IP source bindings that are configured on the system, use the show ip source binding EXEC command.

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

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-address</td>
<td>(Optional) Binding IP address.</td>
</tr>
<tr>
<td>mac-address</td>
<td>(Optional) Binding MAC address.</td>
</tr>
<tr>
<td>dhcp-snooping</td>
<td>(Optional) DHCP-snooping type binding.</td>
</tr>
<tr>
<td>static</td>
<td>(Optional) Statically configured binding.</td>
</tr>
<tr>
<td>vlan vlan-id</td>
<td>(Optional) VLAN number.</td>
</tr>
<tr>
<td>interface interface-name</td>
<td>(Optional) Binding interface.</td>
</tr>
</tbody>
</table>

### Defaults

Displays both static and DHCP snooping bindings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

The optional parameters filter the display output result.

### Examples

This example shows how to display the IP source bindings:

```
Switch# show ip source binding
MacAddress  IpAddress  Lease(sec)  Type   VLAN  Interface
          ---------  ----------  --------  ------  -------  -----------
00:00:00:00:00:01  11.0.0.1     infinite  static  10      FastEthernet6/10
Switch#
```

This example shows how to display the static IP binding entry of IP address 11.0.01:

```
Switch# show ip source binding 11.0.0.1 00:00:00:00:01 static vlan 10 interface Fa6/10
show ip source binding 11.0.0.1 00:00:00:00:01 static vlan 10 interface Fa6/10
MacAddress  IpAddress  Lease(sec)  Type  VLAN  Interface
          ---------  ----------  ------  ------  -------  -----------
00:00:00:00:01  11.0.0.1     infinite  static  10      FastEthernet6/10
Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip source binding</td>
<td>Adds or deletes a static IP source binding entry.</td>
</tr>
</tbody>
</table>
show ip verify source

To display the IP source guard configuration and filters on a particular interface, use the **show ip verify source** command.

```
show ip verify source [interface interface_num]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>interface</strong></td>
<td>(Optional) Specifies an interface.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

These examples show how to display the IP source guard configuration and filters on a particular interface with the **show ip verify source interface** command:

- This output appears when DHCP snooping is enabled on VLANs 10–20, interface fa6/1 has IP source filter mode that is configured as IP, and an existing IP address binding 10.0.0.1 is on VLAN 10:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Filter-type</th>
<th>Filter-mode</th>
<th>IP-address</th>
<th>Mac-address</th>
<th>Vlan</th>
</tr>
</thead>
<tbody>
<tr>
<td>fa6/1</td>
<td>ip</td>
<td>active</td>
<td>10.0.0.1</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>fa6/1</td>
<td>ip</td>
<td>active</td>
<td>deny-all</td>
<td></td>
<td>11-20</td>
</tr>
</tbody>
</table>

  **Note** The second entry shows that a default PVACL (deny all IP traffic) is installed on the port for those snooping-enabled VLANs that do not have a valid IP source binding.

- This output appears when you enter the **show ip verify source interface fa6/2** command and DHCP snooping is enabled on VLANs 10–20, interface fa6/1 has IP source filter mode that is configured as IP, and there is an existing IP address binding 10.0.0.1 on VLAN 10:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Filter-type</th>
<th>Filter-mode</th>
<th>IP-address</th>
<th>Mac-address</th>
<th>Vlan</th>
</tr>
</thead>
<tbody>
<tr>
<td>fa6/2</td>
<td>ip</td>
<td></td>
<td></td>
<td></td>
<td>inactive-trust-port</td>
</tr>
</tbody>
</table>

- This output appears when you enter the **show ip verify source interface fa6/3** command and the interface fa6/3 does not have a VLAN enabled for DHCP snooping:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Filter-type</th>
<th>Filter-mode</th>
<th>IP-address</th>
<th>Mac-address</th>
<th>Vlan</th>
</tr>
</thead>
<tbody>
<tr>
<td>fa6/3</td>
<td>ip</td>
<td>inactive-no-snooping-vlan</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• This output appears when you enter the `show ip verify source interface fa6/4` command and the interface fa6/4 has an IP source filter mode that is configured as IP MAC and the existing IP MAC that binds 10.0.0.2/aaaa.bbbb.cccc on VLAN 10 and 11.0.0.1/aaaa.bbbb.ccccd on VLAN 11:

```
Interface  Filter-type  Filter-mode  IP-address       Mac-address     Vlan
---------  -----------  -----------  ---------------  --------------  ---------
fa6/4      ip-mac      active       10.0.0.2         aaaa.bbbb.cccc  10
fa6/4      ip-mac      active       11.0.0.1         aaaa.bbbb.ccccd 11
fa6/4      ip-mac      active       deny-all         deny-all        12-20
```

• This output appears when you enter the `show ip verify source interface fa6/5` command and the interface fa6/5 has IP source filter mode that is configured as IP MAC and existing IP MAC binding 10.0.0.3/aaaa.bbbb.cccce on VLAN 10, but port security is not enabled on fa6/5:

```
Interface  Filter-type  Filter-mode  IP-address       Mac-address     Vlan
---------  -----------  -----------  ---------------  --------------  ---------
fa6/5      ip-mac      active       10.0.0.3         permit-all      10
fa6/5      ip-mac      active       deny-all         permit-all      11-20
```

**Note**  Enable port security first because the DHCP security MAC filter cannot apply to the port or VLAN.

• This output appears when you enter the `show ip verify source interface fa6/6` command and the interface fa6/6 does not have IP source filter mode that is configured:

DHCP security is not configured on the interface fa6/6.

This example shows how to display all the interfaces on the switch that have DHCP snooping security and IP Port Security tracking enabled with the `show ip verify source` command.

The output is an accumulation of per-interface `show` CLIs:

```
Interface  Filter-type  Filter-mode  IP-address       Mac-address     Vlan
---------  -----------  -----------  ---------------  --------------  ---------
fa6/1      ip          active       10.0.0.1                         10
fa6/1      ip          active       deny-all                         11-20
fa6/2      ip          inactive-trust-port
fa6/3      ip trk      active       40.1.1.24                           10
fa6/3      ip trk      active       40.1.1.20                           10
fa6/3      ip trk      active       40.1.1.21                           10
fa6/4      ip-mac     active       10.0.0.2         aaaa.bbbb.cccc  10
fa6/4      ip-mac     active       11.0.0.1         aaaa.bbbb.ccccd 11
fa6/4      ip-mac     active       deny-all         deny-all        12-20
fa6/5      ip-mac     active       10.0.0.3         permit-all      10
fa6/5      ip-mac     active       deny-all         permit-all      11-20
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip dhcp snooping information option</code></td>
<td>Enables DHCP option 82 data insertion.</td>
</tr>
<tr>
<td><code>ip dhcp snooping limit rate</code></td>
<td>Configures the number of the DHCP messages that an interface can receive per second.</td>
</tr>
<tr>
<td><code>ip dhcp snooping trust</code></td>
<td>Enables DHCP snooping on a trusted VLAN.</td>
</tr>
<tr>
<td><code>ip igmp snooping</code></td>
<td>Enables IGMP snooping.</td>
</tr>
<tr>
<td><code>ip igmp snooping vlan</code></td>
<td>Enables IGMP snooping for a VLAN.</td>
</tr>
<tr>
<td><code>ip source binding</code></td>
<td>Adds or deletes a static IP source binding entry.</td>
</tr>
<tr>
<td><code>ip verify source</code></td>
<td>Enables IP source guard on untrusted Layer 2 interfaces.</td>
</tr>
<tr>
<td><code>show ip source binding</code></td>
<td>Displays the DHCP snooping binding entries.</td>
</tr>
</tbody>
</table>
show ip wccp

To display the Web Cache Communication Protocol (WCCP) global configuration and statistics, use the show ip wccp command in user EXEC or privileged EXEC mode.

```
show ip wccp [service-number [view | detail] | interfaces [cef | counts | detail] | web-cache]
```

**Syntax Description**

- **service-number** (Optional) Identification number of the web cache service group being controlled by the cache. The number can be from 0 to 254. For web caches using Cisco cache engines, the reverse proxy service is indicated by a value of 99.

- **interfaces** (Optional) WCCP redirect interfaces.

- **cef** (Optional) CEF interface statistics, including the number of input, output, dynamic, static, and multicast services.

- **counts** (Optional) WCCP interface count statistics, including the number of CEF and process-switched output and input packets redirected.

- **detail** (Optional) WCCP interface configuration statistics, including the number of input, output, dynamic, static, and multicast services.

- **web-cache** (Optional) Statistics for the web cache service.

- **view** (Optional) Other members of a particular service group, have or have not been detected.

- **detail** (Optional) Information about the router and all web caches.

**Command Modes**

User EXEC (>)
Privileged EXEC (#)

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.0(2)SG</td>
<td>This command was introduced on Catalyst 4900M, Catalyst 4948E, Supervisor Engine 6-E, and Supervisor Engine 6L-E.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the clear ip wccp command to reset the counter for the “Packets Redirected” information.

Use the show ip wccp service-number command to get the “Total Packets S/W Redirected” count. The “Total Packets S/W Redirected” count is the number of packets redirected in software.

Use the show ip wccp service-number detail command to get the “Packets Redirected” count. The “Packets Redirected” count is the number of packets redirected in software.

Use the show ip wccp web-cache detail command to get an indication of which traffic is redirected to which cache engine.

Use the show ip wccp command to show the configured WCCP services and a summary of their current state.

For cache-engine clusters using Cisco cache engines, the reverse proxy service-number is indicated by a value of 99.

All the packet statistics correspond to packets switched in software.
This section contains examples and field descriptions for the following forms of this command:

- `show ip wccp service-number`
- `show ip wccp service-number view`
- `show ip wccp service-number detail`
- `show ip wccp interfaces`
- `show ip wccp web-cache`
- `show ip wccp web-cache detail`
- `show ip wccp`

### show ip wccp service-number

The following is sample output from the `show ip wccp service-number` command:

```
Switch# show ip wccp 90

Global WCCP information:
  Router information:
    Router Identifier:                   100.1.1.16
    Protocol Version:                    2.0

Service Identifier: 90
  Number of Service Group Clients: 1
  Number of Service Group Routers: 1
  Total Packets s/w Redirected: 0
    Process:                           0
    CEF:                               0
  Redirect Access-list:                -none-
  Total Packets Denied Redirect: 0
  Total Packets Unassigned: 0
  Group Access-list:                   -none-
  Total Messages Denied to Group: 0
  Total Authentication failures: 0
  Total Bypassed Packets Received: 0
```

Table 30 describes the significant fields shown in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router information</td>
<td>A list of routers detected by the current router.</td>
</tr>
<tr>
<td>Protocol Version</td>
<td>The version of WCCP being used by the router in the service group.</td>
</tr>
<tr>
<td>Service Identifier</td>
<td>Indicates which service is detailed.</td>
</tr>
<tr>
<td>Number of Service Group Clients</td>
<td>The number of clients that are visible to the router and other</td>
</tr>
<tr>
<td></td>
<td>clients in the service group.</td>
</tr>
<tr>
<td>Number of Service Group Routers</td>
<td>The number of routers in the service group.</td>
</tr>
<tr>
<td>Total Packets s/w Redirected</td>
<td>Total number of packets s/w redirected by the router.</td>
</tr>
<tr>
<td>Redirect Access-list</td>
<td>The name or number of the access list that determines which packets will be redirected.</td>
</tr>
<tr>
<td>Total Packets Denied Redirect</td>
<td>Total number of packets that were not redirected because they did not match the access list.</td>
</tr>
</tbody>
</table>
The following is sample output from the `show ip wccp service-number view` command for service group 1:

```
Switch# show ip wccp 1 view

WCCP Router Informed of:
  10.168.88.10
  10.168.88.20

WCCP Cache Engines Visible
  10.168.88.11
  10.168.88.12

WCCP Cache Engines Not Visible:
  -none-
```

Note: The number of maximum service groups that can be configured is 256.

If any web cache is displayed under the WCCP Cache Engines Not Visible field, the router needs to be reconfigured to map the web cache that is not visible to it.

Table 31 describes the significant fields shown in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCCP Router Informed of</td>
<td>A list of routers detected by the current router.</td>
</tr>
<tr>
<td>WCCP Clients Visible</td>
<td>A list of clients that are visible to the router and other clients in the service group.</td>
</tr>
<tr>
<td>WCCP Clients Not Visible</td>
<td>A list of clients in the service group that are not visible to the router and other clients in the service group.</td>
</tr>
</tbody>
</table>
show ip wccp service-number detail

The following example displays WCCP client information and WCCP router statistics that include the type of services:

Switch# **show ip wccp 91 detail**

WCCP Client information:
- WCCP Client ID: 10.10.10.2
- Protocol Version: 2.0
- State: Usable
- Redirection: L2
- Packet Return: GRE
- Packets Redirected: 0
- Connect Time: 00:05:23
- Assignment: MASK

<table>
<thead>
<tr>
<th>Mask</th>
<th>SrcAddr</th>
<th>DstAddr</th>
<th>SrcPort</th>
<th>DstPort</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000: 0x00000000</td>
<td>0x00000000</td>
<td>0x00000001</td>
<td>0x0000</td>
<td>0x0000</td>
</tr>
</tbody>
</table>

Value SrcAddr | DstAddr | SrcPort | DstPort | CE-IP
----- | ------- | ------- | ------- | ------
0000: 0x00000000 | 0x00000000 | 0x0000 | 0x0000 | 0x0A0A0A02 (10.10.10.2)
0001: 0x00000000 | 0x00000000 | 0x0000 | 0x0000 | 0x0A0A0A02 (10.10.10.2)

show ip wccp interfaces

The following is sample output from the **show ip wccp interfaces** command:

Switch# **show ip wccp interfaces**

WCCP interface configuration:
- FastEthernet10/4
  - Output services: 2
  - Input services: 3
  - Mcast services: 1
  - Exclude In: FALSE

**Table 32** describes the significant fields shown in the display.

**Table 32 show ip wccp interfaces Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output services</td>
<td>Indicates the number of output services configured on the interface.</td>
</tr>
<tr>
<td>Input services</td>
<td>Indicates the number of input services configured on the interface.</td>
</tr>
<tr>
<td>Mcast services</td>
<td>Indicates the number of multicast services configured on the interface.</td>
</tr>
<tr>
<td>Exclude In</td>
<td>Displays whether traffic on the interface is excluded from redirection.</td>
</tr>
</tbody>
</table>

show ip wccp web-cache

The following is sample output from the **show ip wccp web-cache** command:

Switch# **show ip wccp web-cache**

Global WCCP information:
- Router information:
show ip wccp

Router Identifier: 10.10.11.10
Protocol Version: 2.0

Service Identifier: web-cache
Number of Service Group Clients: 1
Number of Service Group Routers: 1
Total Packets Redirected: 0
  Process: 0
  CEF: 0
  Platform: 0
Redirect access-list: no_linux
Total Packets Denied Redirect: 0
Total Packets Unassigned: 0
Group access-list: -none-
Total Messages Denied to Group: 0
Total Authentication failures: 0
Total Bypassed Packets Received: 0

Table 33 describes the significant fields shown in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol Version</td>
<td>Indicates that WCCPv2 is enabled.</td>
</tr>
<tr>
<td>Service Identifier</td>
<td>Indicates which service is detailed.</td>
</tr>
<tr>
<td>Number of Service Group Clients</td>
<td>Number of clients using the router as their home router.</td>
</tr>
<tr>
<td>Number of Service Group Routers</td>
<td>The number of routers in the service group.</td>
</tr>
<tr>
<td>Total Packets s/w Redirected</td>
<td>Total number of packets s/w redirected by the router.</td>
</tr>
<tr>
<td>Redirect access-list</td>
<td>The name or number of the access list that determines which packets will be redirected.</td>
</tr>
<tr>
<td>Total Packets Denied Redirect</td>
<td>Total number of packets that were not redirected because they did not match the access list.</td>
</tr>
<tr>
<td>Total Packets Unassigned</td>
<td>Number of packets that were not redirected because they were not assigned to any cache engine. Packets may not be assigned during initial discovery of cache engines or when a cache is dropped from a cluster.</td>
</tr>
<tr>
<td>Group access-list</td>
<td>Indicates which cache engine is allowed to connect to the router.</td>
</tr>
<tr>
<td>Total Messages Denied to Group</td>
<td>Indicates the number of packets denied by the group-list access list.</td>
</tr>
<tr>
<td>Total Authentication failures</td>
<td>The number of instances where a password did not match.</td>
</tr>
</tbody>
</table>

show ip wccp web-cache detail

The following example displays web cache engine information and WCCP router statistics for the web cache service:

Switch# show ip wccp web-cache detail

WCCP Client information:
  WCCP Client ID: 10.10.10.2
  Protocol Version: 2.0
  State: Usable
  Redirection: L2
  Packet Return: GRE
show ip wccp

Switch# show ip wccp

Global WCCP information:
  Router information:
    Router Identifier: 10.10.11.10
    Protocol Version: 2.0
  Service Identifier: web-cache
    Number of Service Group Clients: 1
    Number of Service Group Routers: 1
    Total Packets s/w Redirected: 0
    Process: 0
    CEF: 0
    Redirect access-list: -none-
    Total Packets Denied Redirect: 0
    Total Packets Unassigned: 0
    Group access-list: -none-
    Total Messages Denied to Group: 0
    Total Authentication failures: 0
    Total Bypassed Packets Received: 0

Service Identifier: 91
  Number of Service Group Clients: 1
  Number of Service Group Routers: 1

Table 34 describes the significant fields shown in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCCP Client Information</td>
<td>The header for the area that contains fields for information on clients.</td>
</tr>
<tr>
<td>WCCP Client ID</td>
<td>The IP address of the cache engine in the service group.</td>
</tr>
<tr>
<td>Protocol Version</td>
<td>The version of WCCP being used by the cache engine in the service group.</td>
</tr>
<tr>
<td>State</td>
<td>Indicates whether the cache engine is operating properly and can be contacted by a router and other cache engines in the service group.</td>
</tr>
<tr>
<td>Packets Redirected</td>
<td>The number of packets that have been redirected to the cache engine.</td>
</tr>
<tr>
<td>Connect Time</td>
<td>The amount of time the cache engine has been connected to the router.</td>
</tr>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>clear ip wccp</code></td>
<td>Clears the counter for packets redirected using WCCP.</td>
</tr>
<tr>
<td><code>ip wccp</code></td>
<td>Enables support of the WCCP service for participation in a service group.</td>
</tr>
<tr>
<td><code>ip wccp redirect</code></td>
<td>Enables packet redirection on an outbound or inbound interface using WCCP.</td>
</tr>
</tbody>
</table>
show ipc

To display IPC information, use the show ipc command.

```
show ipc {nodes | ports | queue | status}
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>nodes</td>
<td>Displays the participating nodes.</td>
</tr>
<tr>
<td>ports</td>
<td>Displays the local IPC ports.</td>
</tr>
<tr>
<td>queue</td>
<td>Displays the contents of the IPC retransmission queue.</td>
</tr>
<tr>
<td>status</td>
<td>Displays the status of the local IPC server.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

**Release**  | **Modification** |
-------------|------------------|
12.1(12c)EW  | Support for this command was introduced on the Catalyst 4500 series switch. |

### Examples

This example shows how to display the participating nodes:

```
Switch# show ipc nodes
There are 3 nodes in this IPC realm.
   ID    Type        Name                  Last Sent Last Heard
          IPC Master         0      0
2010000  Local      GALIOS IPC:Card 1     0     0
2020000  Ethernet   GALIOS IPC:Card 2       12    26
Switch#
```

This example shows how to display the local IPC ports:

```
Switch# show ipc ports
There are 11 ports defined.
   Port ID    Type     Name                  (current/peak/total)
          10000.1 unicast  IPC Master:Zone
          10000.2 unicast  IPC Master:Echo
          10000.3 unicast  IPC Master:Control
          10000.4 unicast  Remote TTY Server Port
          10000.5 unicast  GALIOS RF :Active
                          index = 0  seat_id = 0x2020000  last sent = 0     heard = 1635   0/1/1635
          10000.6 unicast  GALIOS RED:Active
                          index = 0  seat_id = 0x2020000  last sent = 0     heard = 2       0/1/2
          2020000.3 unicast  GALIOS IPC:Card 2:Control
          2020000.4 unicast  GALIOS RFS :Standby
          2020000.5 unicast  Slave: Remote TTY Client Port
          2020000.6 unicast  GALIOS RF :Standby
          2020000.7 unicast  GALIOS RED:Standby
```

show ipc

RPC packets: current/peak/total

Switch#

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

Switch# show ipc queue
There are 0 IPC messages waiting for acknowledgement in the transmit queue.
There are 0 IPC messages waiting for a response.
There are 0 IPC messages waiting for additional fragments.
There are 0 IPC messages currently on the IPC inboundQ.
There are 0 messages currently in use by the system.
Switch#

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

Switch# show ipc status
IPC System Status:

This processor is the IPC master server.

6000 IPC message headers in cache
3363 messages in, 1680 out, 1660 delivered to local port,
1686 acknowledgements received, 1675 sent,
0 NACKs received, 0 sent,
0 messages dropped on input, 0 messages dropped on output
0 no local port, 0 destination unknown, 0 no transport
0 missing callback or queue, 0 duplicate ACKs, 0 retries,
0 message timeouts.
0 ipc_output failures, 0 mtu failures,
0 msg alloc failed, 0 emer msg alloc failed, 0 no origs for RPC replies
0 p ck alloc failed, 0 memd alloc failed
0 no hwq, 1 failed opens, 0 hardware errors
No regular dropping of IPC output packets for test purposes
Switch#
show ipv6 snooping counters

To display the number of packets dropped per port due to RA Guard, use the `show ipv6 snooping counters` command.

**show ipv6 snooping counters interface**

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface</code></td>
<td>Specifies the interface.</td>
</tr>
</tbody>
</table>

**Defaults**

None

**Command Modes**

Interface mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>The <code>show ipv6 first-hop counters</code> command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>15.0(2)SG, XE 3.3.0SG</td>
<td>Same behavior, new syntax; <code>show ipv6 snooping counters</code></td>
</tr>
</tbody>
</table>

**Examples**

This example provides a sample output for the `show ipv6 snooping counters` command on interface Gi2/49:

```
Switch# show ipv6 snooping counters int gi 2/48
Received messages on Gi2/48:
Protocol       Protocol message
ICMPv6         RS        RA       NS       NA       REDIR      CPS       CPA
0              0         0        0        0        0          0         0

Bridged messages from Gi2/48:
Protocol       Protocol message
ICMPv6         RS        RA       NS       NA       REDIR      CPS       CPA
0              0         0        0        0        0          0         0

Dropped messages on Gi2/49:
Feature/Message RS        RA       NS       NA       REDIR      CPS       CPA
Dropped reasons on Gi2/49:
Switch#  
```

**Note**

Only RA (Router Advertisement) and REDIR (Router Redirected packets) counters are supported in Cisco IOS Release 12.2(54)SG.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>epm access control</code></td>
<td>Configures access control.</td>
</tr>
</tbody>
</table>
show ipv6 mld snooping

To display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping configuration of the switch or the VLAN, use the `show ipv6 mld snooping` command.

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

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

**Command Modes**
- User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(40)SG</td>
<td>This command was introduced on the Catalyst 4500.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command to display MLD snooping configuration for the switch or for a specific VLAN. VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

**Examples**

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

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

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

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

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

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

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

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv6 mld snooping</td>
<td>Enables IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping globally or on the specified VLAN.</td>
</tr>
</tbody>
</table>
show ipv6 mld snooping mrouter

To display dynamically learned and manually configured IP version 6 (IPv6) Multicast Listener Discovery (MLD) switch ports for the switch or a VLAN, use the show ipv6 mld snooping mrouter command.

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vlan vlan-id</td>
<td>(Optional) Specifies a VLAN; the range is 1 to 1001 and 1006 to 4094.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(40)SG</td>
<td>This command was introduced on Catalyst 4500.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command to display MLD snooping switch ports for the switch or for a specific VLAN. VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

**Examples**

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

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

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

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

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv6 mld snooping</td>
<td>Enables IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping globally or on the specified VLAN.</td>
</tr>
<tr>
<td>ipv6 mld snooping vlan</td>
<td>Configures IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping parameters on the VLAN interface.</td>
</tr>
</tbody>
</table>
show ipv6 mld snooping querier

To display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping querier-related information most recently received by the switch or the VLAN, use the `show ipv6 mld snooping querier` command.

```
show ipv6 mld snooping querier [vlan vlan-id]
```

**Syntax Description**
- `vlan vlan-id` (Optional) Specifies a VLAN; the range is 1 to 1001 and 1006 to 4094.

**Command Modes**
- User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(40)SG</td>
<td>This command was introduced on the Catalyst 4500.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

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

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

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

**Examples**

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

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

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

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv6 mld snooping</td>
<td>Enables IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping globally or on the specified VLAN.</td>
</tr>
<tr>
<td>ipv6 mld snooping last-listener-query-count</td>
<td>Configures IP version 6 (IPv6) Multicast Listener Discovery Multicast Address Specific Queries (MASQs) that will be sent before aging out a client.</td>
</tr>
<tr>
<td>ipv6 mld snooping last-listener-query-interval</td>
<td>Configures IP version 6 (IPv6) MLD snooping last-listener query interval on the switch or on a VLAN.</td>
</tr>
<tr>
<td>ipv6 mld snooping robustness-variable</td>
<td>Configures the number of IP version 6 (IPv6) MLD queries that the switch sends before deleting a listener that does not respond.</td>
</tr>
<tr>
<td>ipv6 mld snooping tcn</td>
<td>Configures IP version 6 (IPv6) MLD Topology Change Notifications (TCNs).</td>
</tr>
</tbody>
</table>
show issu capability

To display the ISSU capability for a client, use the show issu capability command.

```
show issu capability [entries | groups | types] [client_id]
```

### Syntax Description

| entries | Displays a list of Capability Types and Dependent Capability Types that are included in a single Capability Entry. Types within an entry can also be independent. |
| groups | Displays a list of Capability Entries in priority order (the order that they will be negotiated on a session). |
| types | Displays an ID that identifies a particular capability. |
| client_id | (Optional) Identifies the client registered to the ISSU infrastructure. To obtain a list of client IDs, use the show issu clients command. |

### Defaults

This command has no default settings.

### Command Modes

User EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

Capability is a functionality that an ISSU client can support and is required to interoperate with peers. When an ISSU-aware client establishes its session with the peer, an ISSU negotiation takes place. The ISSU infrastructure uses the registered information to negotiate the capabilities and the message version to be used during the session.

### Examples

The following example shows how to display the ISSU capability types for the IP host ISSU client (clientid=2082):

```
Switch# show issu capability types 2082
Client_ID = 2082, Entity_ID = 1 :
  Cap_Type = 0
Switch#
```

The following example shows how to display the ISSU capabilities entries for the IP host ISSU client (clientid=2082):

```
Switch# show issu capability entries 2082
Client_ID = 2082, Entity_ID = 1 :
  Cap_Entry = 1 :
    Cap_Type = 0
Switch#
```


The following example shows how to display the ISSU capabilities groups for the IP host ISSU client (clientid=2082):

Switch# `show issu capability groups 2082`
Client_ID = 2082, Entity_ID = 1:
  Cap_Group = 1:
    Cap_Entry = 1
    Cap_Type = 0
Switch#

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>show issu clients</code></td>
<td>Displays the ISSU clients.</td>
</tr>
</tbody>
</table>
show issu clients

To display the ISSU clients, use the `show issu clients` command.

```
show issu clients [peer_uid]
```

**Syntax Description**

- `peer_uid` (Optional) Displays a list of clients registered to ISSU infrastructure at the peer supervisor engine.

**Defaults**

Displays a list of clients registered to the ISSU infrastructure at the supervisor engine where the command is entered.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To implement ISSU versioning functionality, a client must first register itself, client capability, and client message information with the ISSU infrastructure during the system initialization.

**Examples**

The following example shows how to display the ISSU clients:

```
Switch# show issu clients
Client_ID = 2, Client_Name = ISSU Proto client, Entity_Count = 1
Client_ID = 3, Client_Name = ISSU RF, Entity_Count = 1
Client_ID = 4, Client_Name = ISSU CF client, Entity_Count = 1
Client_ID = 5, Client_Name = ISSU Network RF client, Entity_Count = 1
Client_ID = 7, Client_Name = ISSU CONFIG SYNC, Entity_Count = 1
Client_ID = 8, Client_Name = ISSU ifIndex sync, Entity_Count = 1
Client_ID = 9, Client_Name = ISSU IPC client, Entity_Count = 1
Client_ID = 10, Client_Name = ISSU IPC Server client, Entity_Count = 1
Client_ID = 11, Client_Name = ISSU Red Mode Client, Entity_Count = 1
Client_ID = 100, Client_Name = ISSU rfs client, Entity_Count = 1
Client_ID = 110, Client_Name = ISSU ifs client, Entity_Count = 1
Client_ID = 200, Client_Name = ISSU Event Manager client, Entity_Count = 1
Client_ID = 2002, Client_Name = CEF Push ISSU client, Entity_Count = 1
Client_ID = 2003, Client_Name = ISSU XDR client, Entity_Count = 1
Client_ID = 2004, Client_Name = ISSU SNMP client, Entity_Count = 1
Client_ID = 2010, Client_Name = ARP HA, Entity_Count = 1
Client_ID = 2012, Client_Name = ISSU HSRP Client, Entity_Count = 1
Client_ID = 2021, Client_Name = XDR Int Priority ISSU client, Entity_Count = 1
Client_ID = 2022, Client_Name = XDR Proc Priority ISSU client, Entity_Count = 1
Client_ID = 2023, Client_Name = FIB HW IDB ISSU client, Entity_Count = 1
Client_ID = 2024, Client_Name = FIB HW subblock ISSU client, Entity_Count = 1
Client_ID = 2025, Client_Name = FIB HW subblock ISSU client, Entity_Count = 1
Client_ID = 2026, Client_Name = FIB SW subblock ISSU client, Entity_Count = 1
Client_ID = 2027, Client_Name = Adjacency ISSU client, Entity_Count = 1
Client_ID = 2028, Client_Name = FIB IPV4 ISSU client, Entity_Count = 1
```
show issu clients

Client_ID = 2054,  Client_Name = ISSU process client,  Entity_Count = 1
Client_ID = 2058,  Client_Name = ISIS ISSU RTR client,  Entity_Count = 1
Client_ID = 2059,  Client_Name = ISIS ISSU UPD client,  Entity_Count = 1
Client_ID = 2067,  Client_Name = ISSU PM Client,  Entity_Count = 1
Client_ID = 2068,  Client_Name = ISSU PAGP_SWITCH Client,  Entity_Count = 1
Client_ID = 2070,  Client_Name = ISSU Port Security client,  Entity_Count = 1
Client_ID = 2071,  Client_Name = ISSU Switch VLAN client,  Entity_Count = 1
Client_ID = 2072,  Client_Name = ISSU dot1x client,  Entity_Count = 1
Client_ID = 2073,  Client_Name = ISSU STP,  Entity_Count = 1
Client_ID = 2077,  Client_Name = ISSU C4K Chassis client,  Entity_Count = 1
Client_ID = 4001,  Client_Name = ISSU C4K Chassis client,  Entity_Count = 1
Client_ID = 4002,  Client_Name = ISSU C4K Port client,  Entity_Count = 1
Client_ID = 4003,  Client_Name = ISSU C4K Rkios client,  Entity_Count = 1
Client_ID = 4004,  Client_Name = ISSU C4K HostMan client,  Entity_Count = 1
Client_ID = 4005,  Client_Name = ISSU C4k GaliosRedundancy client,  Entity_Count = 1

Base Clients:
Client_Name = ISSU Proto client
Client_Name = ISSU RF
Client_Name = ISSU CF client
Client_Name = ISSU Network RF client
Client_Name = ISSU CONFIG SYNC
Client_Name = ISSU ifIndex sync
Client_Name = ISSU IPC client
Client_Name = ISSU IPC Server client
Client_Name = ISSU Red Mode Client
Client_Name = ISSU rfs client
Client_Name = ISSU ifs client
Client_Name = ISSU Event Manager client
Client_Name = CEF Push ISSU client
Client_Name = ISSU XDR client
Client_Name = ARP HA
Client_Name = XDR Int Priority ISSU client
Client_Name = XDR Proc Priority ISSU client
Client_Name = FIB HWIDB ISSU client
Client_Name = FIB IDB ISSU client
Client_Name = FIB HW subblock ISSU client
Client_Name = FIB SW subblock ISSU client
Client_Name = Adjacency ISSU client
Client_Name = FIB IPv4 ISSU client
Client_Name = ISSU process client
Client_Name = ISSU PM Client
Client_Name = ISSU C4K Chassis client
Client_Name = ISSU C4K Port client
Client_Name = ISSU C4K Rkios client
Client_Name = ISSU C4K HostMan client
Client_Name = ISSU C4k GaliosRedundancy client

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>show issu capability</td>
<td>Displays the ISSU capability for a client.</td>
</tr>
<tr>
<td>show issu entities</td>
<td>Displays the ISSU entity information.</td>
</tr>
</tbody>
</table>
show issu comp-matrix

To display information regarding the In Service Software Upgrade (ISSU) compatibility matrix, use the `show issu comp-matrix` command.

```
show issu comp-matrix {negotiated | stored | xml}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>negotiated</code></td>
<td>Displays negotiated compatibility matrix information.</td>
</tr>
<tr>
<td><code>stored</code></td>
<td>Displays stored compatibility matrix information.</td>
</tr>
<tr>
<td><code>xml</code></td>
<td>Displays negotiated compatibility matrix information in XML format.</td>
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</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
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<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
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</table>

**Usage Guidelines**

Before attempting an ISSU, you should know the compatibility level between the old and the new Cisco IOS software versions on the active and the standby supervisor engines. ISSU will not work if the two versions are incompatible.

The compatibility matrix is available on Cisco.com so that you can also view in advance whether an upgrade can be performed with the ISSU process. The compatibility matrix during the ISSU process and later by entering the `show issu comp-matrix` command. To display information on the negotiation of the compatibility matrix data between two software versions on a given system, use the `show issu comp-matrix negotiated` command.

Compatibility matrix data is stored with each Cisco IOS software image that supports ISSU capability. To display stored compatibility matrix information, use the `show issu comp-matrix stored` command.

The compatibility matrix information are built-in any Cisco IOS ISSU image. The ISSU infrastructure performs a matrix lookup as soon as the communication with the standby supervisor engine is established. There are three possible results from the lookup operation:

- Compatible—The Base-level system infrastructure and all optional HA-aware subsystems are compatible. In-service upgrade or downgrade between these versions will succeed with minimal service impact.

- Base-Level Compatible—One or more of the optional HA-aware subsystems are not compatible. Although an in-service upgrade or downgrade between these versions will succeed, some subsystems will not be able to maintain their state during the switchover. Prior to attempting an in-service upgrade or downgrade, the impact of this on operation and service of the switch must be considered carefully.
Incompatible—A set of core system infrastructure must be able to execute in a stateful manner for SSO to function correctly. If any of these “required” features or subsystems is not compatible in two different Cisco IOS images, the two versions of the Cisco IOS images are declared “Incompatible”. This means that an in-service upgrade or downgrade between these versions is not possible. The systems operates in RPR mode during the period when the versions of Cisco IOS at the active and standby supervisor engines differ.

### Examples

This example displays negotiated compatibility matrix information:

```
Switch# show issu comp-matrix negotiated
CardType: WS-C4507R(112), Uid: 2, Image Ver: 12.2(31)SGA
Image Name: cat4500-ENTSERVICES-M
```

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<tr>
<td>2028</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>N - did not negotiate</td>
</tr>
<tr>
<td>2054</td>
<td>1</td>
<td>1</td>
<td>262169</td>
<td>8</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2058</td>
<td>1</td>
<td>1</td>
<td>262154</td>
<td>29</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2059</td>
<td>1</td>
<td>1</td>
<td>262179</td>
<td>30</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2067</td>
<td>1</td>
<td>1</td>
<td>262153</td>
<td>12</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2068</td>
<td>1</td>
<td>1</td>
<td>196638</td>
<td>40</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2070</td>
<td>1</td>
<td>1</td>
<td>262145</td>
<td>21</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2071</td>
<td>1</td>
<td>1</td>
<td>262178</td>
<td>11</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2072</td>
<td>1</td>
<td>1</td>
<td>262162</td>
<td>28</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2073</td>
<td>1</td>
<td>1</td>
<td>262177</td>
<td>33</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2077</td>
<td>1</td>
<td>1</td>
<td>262165</td>
<td>35</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2078</td>
<td>1</td>
<td>1</td>
<td>196637</td>
<td>34</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2079</td>
<td>1</td>
<td>1</td>
<td>262176</td>
<td>36</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2081</td>
<td>1</td>
<td>1</td>
<td>262150</td>
<td>37</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2082</td>
<td>1</td>
<td>1</td>
<td>262161</td>
<td>39</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2083</td>
<td>1</td>
<td>1</td>
<td>262184</td>
<td>20</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>2084</td>
<td>1</td>
<td>1</td>
<td>262183</td>
<td>38</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>4001</td>
<td>101</td>
<td>1</td>
<td>262181</td>
<td>17</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>4002</td>
<td>201</td>
<td>1</td>
<td>262164</td>
<td>18</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>4003</td>
<td>301</td>
<td>1</td>
<td>262182</td>
<td>19</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>4004</td>
<td>401</td>
<td>1</td>
<td>262146</td>
<td>22</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>4005</td>
<td>1</td>
<td>1</td>
<td>262149</td>
<td>4</td>
<td>1</td>
<td>Y</td>
</tr>
</tbody>
</table>

List of Clients:

<table>
<thead>
<tr>
<th>Cid</th>
<th>Client Name</th>
<th>Base/Non-Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>ISSU Proto client</td>
<td>Base</td>
</tr>
<tr>
<td>3</td>
<td>ISSU RF</td>
<td>Base</td>
</tr>
<tr>
<td>4</td>
<td>ISSU CF client</td>
<td>Base</td>
</tr>
<tr>
<td>5</td>
<td>ISSU Network RF client</td>
<td>Base</td>
</tr>
<tr>
<td>7</td>
<td>ISSU CONFIG SYNC</td>
<td>Base</td>
</tr>
</tbody>
</table>
This example displays stored compatibility matrix information:

Switch> **show issu comp-matrix stored**

Number of Matrices in Table = 1

<table>
<thead>
<tr>
<th>ISSU ID</th>
<th>Feature</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>My Image ver: 12.2(31)SGA</td>
<td>12.2(31)SGA</td>
</tr>
<tr>
<td>13</td>
<td>Peer Version</td>
<td>Base</td>
</tr>
<tr>
<td>14</td>
<td>Compatibility</td>
<td>Comp(3)</td>
</tr>
</tbody>
</table>
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show issu clients</td>
<td>Displays the ISSU clients.</td>
</tr>
<tr>
<td>show issu sessions</td>
<td>Displays ISSU session information for a specified client.</td>
</tr>
</tbody>
</table>
show issu endpoints

To display the ISSU endpoint information, use the **show issu endpoints** command.

```
show issu endpoints
```

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

**Defaults**
This command has no default settings.

**Command Modes**
User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
Endpoint is an execution unit within a redundancy domain. There are only 2 endpoints on the Catalyst 4500 series switch redundant chassis: 1 and 2. The endpoints correspond to the slot numbers for the supervisor engine. The ISSU infrastructure communicates between these two endpoints to establish session and to perform session negotiation for ISSU clients.

**Examples**
The following example shows how to display the ISSU endpoints:

```
Switch# show issu endpoints
My_Unique_ID = 1/0x1, Client_Count = 46

This endpoint communicates with 1 peer endpoints:

<table>
<thead>
<tr>
<th>Peer_Unique_ID</th>
<th>CAP</th>
<th>VER</th>
<th>XFORM</th>
<th>ERP</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/0x2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Same</td>
</tr>
</tbody>
</table>

Shared Negotiation Session Info:
- Nego_Session_ID = 15
- Nego_Session_Name = shared nego session
- Transport_Mtu = 4096
- Ses_In_Use = 2

Switch#
```

**Related Commands**
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show issu clients</td>
<td>Displays the ISSU clients.</td>
</tr>
</tbody>
</table>
show issu entities

To display the ISSU entity information, use the show issu entities command.

```
show issu entities [client_id]
```

**Syntax Description**

client_id

(Optional) ISSU client ID.

**Defaults**

This command has no default settings.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Entity is a logical group of sessions with some common attributes (like capability list and message type). Currently, most ISSU clients on the Catalyst 4500 series switch have only one entity.

**Examples**

The following example shows how to display the entity information for a specified ISSU client:

```
Switch#show issu entities 2072
Client_ID = 2072:
    Entity_ID = 1, Entity_Name = ISSU dot1x entity:
    MsgType  MsgGroup  CapType  CapEntry  CapGroup
    Count    Count    Count    count    Count
    28        1        1        1        1

Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show issu clients</td>
<td>Displays the ISSU clients.</td>
</tr>
</tbody>
</table>
show issu fsm

This command is not intended for end-users.

To display the ISSU finite state machine (FSM) information corresponding to an ISSU session, use the `show issu fsm` command.

```
show issu fsm [session_id]
```

**Syntax Description**

```
session_id  (Optional) Provides detailed information about the FSM for the specified session.
```

**Defaults**

This command has no default settings.

**Command Modes**

User EXEC mode

**Command History**

**Release**  
12.2(31)SGA  
This command was introduced on the Catalyst 4500 series switch.

**Examples**

The following example displays and verifies the ISSU state after LOADVERSION:

```
Switch# show issu fsm 26
Session_ID = 26 :
  FSM_Name   Curr_State  Old_State  Error_Reason
  FSM_L1     TRANS      A_VER      none
  FSM_L2_HELLO EXIT      RCVD      none
  FSM_L2_A_CAP A_EXIT    A_RSP      none
  FSM_L2_P_CAP P_INIT    unknown   none
  FSM_L2_A_VER A_EXIT    A_RES_RSP none
  FSM_L2_P_VER P_INIT    unknown   none
  FSM_L2_TRANS COMP      COMP      none
Current FSM is FSM_L2_TRANS
Session is compatible
Negotiation started at 00:01:07.688, duration is 0.148 seconds
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show issu clients</td>
<td>Displays the ISSU clients.</td>
</tr>
<tr>
<td>show issu sessions</td>
<td>Displays ISSU session information for a specified client.</td>
</tr>
</tbody>
</table>
**show issu message**

To display checkpoint messages for a specified ISSU client, use the **show issu message** command.

```
show issu message {groups | types} [client_id]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>groups</td>
<td>Displays information on Message Group supported by the specified client.</td>
</tr>
<tr>
<td>types</td>
<td>Displays information on all Message Types supported by the specified client.</td>
</tr>
<tr>
<td>client_id</td>
<td>(Optional) Specifies a client ID.</td>
</tr>
</tbody>
</table>

**Defaults**

If client ID is not specified, displays message groups or message types information for all clients registered to the ISSU infrastructure.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Messages are sync-data (also known as checkpoint data) sent between two endpoints. When an ISSU-aware client establishes its session with a peer, an ISSU negotiation takes place. The ISSU infrastructure uses the registered information to negotiate the capabilities and the message version to be used during the session.

**Examples**

The following example shows how to display the message groups for Client_id 2082:

```
Switch#show issu message groups 2082
Client_ID = 2082,  Entity_ID = 1 :
   Message_Group = 1 :
      Message_Type = 1,  Version_Range = 1 ~ 2
      Message_Type = 2,  Version_Range = 1 ~ 2
Switch#
```

The following example shows how to display the message types for Client_id 2082:

```
Switch#show issu message types 2082
Client_ID = 2082,  Entity_ID = 1 :
   Message_Type = 1,  Version_Range = 1 ~ 2
      Message_Ver = 1,    Message_Mtu = 12
      Message_Ver = 2,    Message_Mtu = 8
   Message_Type = 2,  Version_Range = 1 ~ 2
      Message_Ver = 1,    Message_Mtu = 32
      Message_Ver = 2,    Message_Mtu = 28
Switch#
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show issu clients</code></td>
<td>Displays the ISSU clients.</td>
</tr>
</tbody>
</table>
**show issu negotiated**

To display the negotiated capability and message version information of the ISSU clients, use the `show issu negotiated` command.

```
show issu negotiated [capability | version] [session_id]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>capability</td>
<td>Displays all negotiated capabilities.</td>
</tr>
<tr>
<td>version</td>
<td>Displays details of all negotiated messages.</td>
</tr>
<tr>
<td>session_id</td>
<td>(Optional) Specifies the ISSU session ID for which the capability or version information is displayed.</td>
</tr>
</tbody>
</table>

**Defaults**

Displays negotiated capability or version information for all ISSU sessions.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

The following example shows how to display the message types for a specific group:

```
Switch# show issu negotiated capability 26
Session_ID = 26 :
  Cap_Type = 0,     Cap_Result = 1     No cap value assigned

Switch# show issu negotiated version 26
Session_ID = 26 :
  Message_Type = 1,  Negotiated_Version = 1,  Message_MTU = 44
  Message_Type = 2,  Negotiated_Version = 1,  Message_MTU = 4
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show issu sessions</td>
<td>Displays ISSU session information for a specified client.</td>
</tr>
</tbody>
</table>
show issu rollback-timer

To display ISSU rollback-timer status, use the **show issu rollback-timer** command.

```
show issu rollback-timer
```

**Syntax Description**

This command has no arguments or keywords.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

The following example shows how to display the rollback-timer status:

```
Switch#show issu rollback-timer
    Rollback Process State = Not in progress
    Configured Rollback Time = 45:00
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>issu acceptversion</strong></td>
<td>Halts the rollback timer and ensures that the new Cisco IOS software image is not automatically stopped during the ISSU process.</td>
</tr>
<tr>
<td><strong>issu runversion</strong></td>
<td>Forces a change from the active supervisor engine to the standby supervisor engine and causes the newly active supervisor engine to run the new image specified in the <strong>issu loadversion</strong> command.</td>
</tr>
</tbody>
</table>
show issu sessions

To display ISSU session information for a specified client, use the `show issu sessions` command.

```
show issu sessions [client_id]
```

**Syntax Description**

- `client_id` (Optional) Specifies the ISSU client ID.

**Defaults**

Displays session information for all clients registered to the ISSU infrastructure.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Session is bidirectional and a reliable connection is established between two endpoints. Sync-data and negotiation messages are sent to the peer endpoint through a session. On a Catalyst 4500 series switch, each ISSU-aware client has a maximum of one session at each endpoint.

When an ISSU-aware client establishes its session with the peer, an ISSU negotiation takes place. The ISSU infrastructure uses the registered information to negotiate the capabilities and the message version to be used during the session.

**Examples**

The following example shows how to display the rollback-timer status:

```
Switch# show issu sessions 2072
Client_ID = 2072, Entity_ID = 1 :
*** Session_ID = 26, Session_Name = dot1x :

Peer UniqueID  Peer Sid  Negotiate Role  Negotiated Cap  Msg  Session
     UniqueID  Sid    Result GroupID GroupID  Signature
     2       26  PRIMARY COMPATIBLE 1   1  0
(no policy)

Negotiation Session Info for This Message Session:
   Nego_Session_ID = 26
   Nego_Session_Name = dot1x
   Transport_Mtu = 17884

Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show issu clients</td>
<td>Displays the ISSU clients.</td>
</tr>
</tbody>
</table>
show issu state

To display the ISSU state and current booted image name during the ISSU process, use the `show issu state` command.

```
show issu state [slot_number] [detail]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot_number</td>
<td>(Optional) Specifies the slot number whose ISSU state needs to be displayed</td>
</tr>
<tr>
<td></td>
<td>(1 or 2).</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Provides detailed information about the state of the active and</td>
</tr>
<tr>
<td></td>
<td>standby supervisor engines.</td>
</tr>
</tbody>
</table>

**Defaults**

The command displays the ISSU state and current booted image name of both the active and standby supervisor engines.

**Command Modes**

Privileged EXEC mode

**Command History**

- **Release**: 12.2(31)SGA
- **Modification**: This command was introduced on the Catalyst 4500 series switch.

**Usage Guidelines**

It might take several seconds after the `issu loadversion` command is entered for Cisco IOS software to load onto the standby supervisor engine and the standby supervisor engine to transition to SSO mode. If you enter the `show issu state` command too soon, you might not see the information you need.

**Examples**

The following example displays and verifies the ISSU state after LOADVERSION:

```
Switch# show issu state detail

Slot = 1
RP State = Active
ISSU State = Load Version
Boot Variable = bootflash:old_image,12
Operating Mode = Stateful Switchover
Primary Version = bootflash:old_image
Secondary Version = bootflash:new_image
Current Version = bootflash:old_image

Slot = 2
RP State = Standby
ISSU State = Load Version
Boot Variable = bootflash:new_image,12;bootflash:old_image,12
Operating Mode = Stateful Switchover
Primary Version = bootflash:old_image
Secondary Version = bootflash:new_image
Current Version = bootflash:new_image
```

Switch#
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>issu abortversion</strong></td>
<td>Cancels the ISSU upgrade or the downgrade process in progress and restores the switch to its state before the start of the process.</td>
</tr>
<tr>
<td><strong>issu acceptversion</strong></td>
<td>Halts the rollback timer and ensures that the new Cisco IOS software image is not automatically stopped during the ISSU process.</td>
</tr>
<tr>
<td><strong>issu commitversion</strong></td>
<td>Loads the new Cisco IOS software image into the new standby supervisor engine.</td>
</tr>
<tr>
<td><strong>issu loadversion</strong></td>
<td>Starts the ISSU process.</td>
</tr>
<tr>
<td><strong>issu runversion</strong></td>
<td>Forces a change from the active supervisor engine to the standby supervisor engine and causes the newly active supervisor engine to run the new image specified.</td>
</tr>
</tbody>
</table>
show l2protocol-tunnel

To display information about the Layer 2 protocol tunnel ports, use the `show l2protocol-tunnel` command. This command displays information for the interfaces with protocol tunneling enabled.

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

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>interface</strong></td>
<td>interface-id (Optional) Specifies the interface for which protocol tunneling information appears. Valid interfaces are physical ports and port channels; the port channel range is 1 to 64.</td>
</tr>
<tr>
<td><strong>summary</strong></td>
<td>(Optional) Displays only Layer 2 protocol summary information.</td>
</tr>
<tr>
<td><strong>begin</strong></td>
<td>(Optional) Displays information beginning with the line that matches the expression.</td>
</tr>
<tr>
<td><strong>exclude</strong></td>
<td>(Optional) Displays information that excludes lines that match the expression.</td>
</tr>
<tr>
<td><strong>include</strong></td>
<td>(Optional) Displays the lines that match the specified expression.</td>
</tr>
<tr>
<td><strong>expression</strong></td>
<td>(Optional) Expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

### Command Modes

User EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(18)EW</td>
<td>This command was first introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

After enabling Layer 2 protocol tunneling on an access or 802.1Q tunnel port with the `l2protocol-tunnel` command, you can configure some or all of these parameters:

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

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

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

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

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

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

<table>
<thead>
<tr>
<th>Port</th>
<th>Protocol</th>
<th>Shutdown</th>
<th>Drop</th>
<th>Encapsulation</th>
<th>Decapsulation</th>
<th>Drop</th>
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<tbody>
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</tr>
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<tr>
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<tr>
<td></td>
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<td>0</td>
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<tr>
<td></td>
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<td>----</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
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<td>udld</td>
<td>----</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>
```

Switch#

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

```
Switch> show l2protocol-tunnel summary
COS for Encapsulated Packets: 5

<table>
<thead>
<tr>
<th>Port</th>
<th>Protocol</th>
<th>Shutdown</th>
<th>Drop</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Protocol</td>
<td>Threshold (cdp/stp/vtp)</td>
<td>Threshold (cdp/stp/vtp)</td>
<td>(pagp/lacp/udld)</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>-------------------------</td>
<td>-------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Fa0/10</td>
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<td>---/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
<tr>
<td></td>
<td>vtp</td>
<td>stp/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
<tr>
<td></td>
<td>pagp</td>
<td>stp/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
<tr>
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<td>lacp</td>
<td>stp/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
<tr>
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<td>----/----/----</td>
<td>up</td>
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<tr>
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<td>cdp</td>
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<td>900/900/900</td>
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</tr>
<tr>
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<td>stp</td>
<td>1100/1100/1100</td>
<td>900/900/900</td>
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</tr>
<tr>
<td></td>
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<td>1100/1100/1100</td>
<td>900/900/900</td>
<td>up</td>
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<tr>
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<td>900/900/900</td>
<td>up</td>
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<tr>
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<td>900/900/900</td>
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</tr>
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<td>900/900/900</td>
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</tr>
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<td>----/----/----</td>
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<td>----/----/----</td>
<td>up</td>
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<td>vtp</td>
<td>----/----/----</td>
<td>----/----/----</td>
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<td>----/----/----</td>
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</tr>
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<td>up</td>
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<td>up</td>
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<td>----/----/----</td>
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<td>up</td>
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<tr>
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<td>----/----/----</td>
<td>----/----/----</td>
<td>up</td>
</tr>
</tbody>
</table>
```

Switch#
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>l2protocol-tunnel</code></td>
<td>Enables protocol tunneling on an interface.</td>
</tr>
<tr>
<td><code>l2protocol-tunnel cos</code></td>
<td>Configures the class of service (CoS) value for all tunneled Layer 2 protocol packets.</td>
</tr>
</tbody>
</table>
show lacp

To display LACP information, use the `show lacp` command.

```
show lacp [channel-group] {counters | internal | neighbors | sys-id}
```

### Syntax Description

- **channel-group**: (Optional) Number of the channel group; valid values are from 1 to 64.
- **counters**: Displays the LACP statistical information.
- **internal**: Displays the internal information.
- **neighbors**: Displays the neighbor information.
- **sys-id**: Displays the LACP system identification.

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 Series Switches.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

This command is not supported on systems that are configured with a Supervisor Engine I.

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

You can enter the optional `channel-group` value to specify a channel group for all keywords, except the `sys-id` keyword.

### Examples

This example shows how to display LACP statistical information for a specific channel group:

```
Switch# show lacp 1 counters

<table>
<thead>
<tr>
<th>Port</th>
<th>LACPDU</th>
<th>Marker</th>
<th>LACPDU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sent</td>
<td>Recv</td>
<td>Sent</td>
</tr>
<tr>
<td></td>
<td>Pkts</td>
<td>Err</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Channel group: 1</td>
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</tr>
<tr>
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<td>8</td>
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</tr>
<tr>
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<td>18</td>
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</tr>
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<td>18</td>
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</tr>
<tr>
<td>Fa4/4</td>
<td>13</td>
<td>18</td>
<td>0</td>
</tr>
</tbody>
</table>
```

The output displays the following information:

- The LACPDU Sent and Recv columns display the LACPDU sent and received on each specific interface.
- The LACPDU Pkts and Err columns display the marker protocol packets.
This example shows how to display internal information for the interfaces belonging to a specific channel:

Switch# `show lacp 1 internal`

Flags:  
- S - Device sends PDUs at slow rate.  
- F - Device sends PDUs at fast rate.  
- A - Device is in Active mode.  
- P - Device is in Passive mode.

Channel group 1

<table>
<thead>
<tr>
<th>Port</th>
<th>Flags</th>
<th>State</th>
<th>Interval</th>
<th>LACP Port</th>
<th>Admin</th>
<th>Oper</th>
<th>Port</th>
<th>Port</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa4/1</td>
<td>saC</td>
<td>bndl</td>
<td>30s</td>
<td>32768</td>
<td>100</td>
<td>100</td>
<td>0xc1</td>
<td>0x75</td>
<td></td>
</tr>
<tr>
<td>Fa4/2</td>
<td>saC</td>
<td>bndl</td>
<td>30s</td>
<td>32768</td>
<td>100</td>
<td>100</td>
<td>0xc2</td>
<td>0x75</td>
<td></td>
</tr>
<tr>
<td>Fa4/3</td>
<td>saC</td>
<td>bndl</td>
<td>30s</td>
<td>32768</td>
<td>100</td>
<td>100</td>
<td>0xc3</td>
<td>0x75</td>
<td></td>
</tr>
<tr>
<td>Fa4/4</td>
<td>saC</td>
<td>bndl</td>
<td>30s</td>
<td>32768</td>
<td>100</td>
<td>100</td>
<td>0xc4</td>
<td>0x75</td>
<td></td>
</tr>
</tbody>
</table>

Switch#

Table 2-35 lists the output field definitions.

**Table 2-35  show lacp internal Command Output Fields**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>State of the specific port at the current moment is displayed; allowed values are as follows:</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>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>hot-sby</code>—Port is in a hot-standby state.</td>
</tr>
<tr>
<td></td>
<td>• <code>down</code>—Port is down.</td>
</tr>
<tr>
<td>LACPDUs Interval</td>
<td>Interval setting.</td>
</tr>
<tr>
<td>LACP Port Priority</td>
<td>Port priority setting.</td>
</tr>
<tr>
<td>Admin Key</td>
<td>Administrative key.</td>
</tr>
<tr>
<td>Oper Key</td>
<td>Operator key.</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 the following meaning [1]:</td>
</tr>
<tr>
<td></td>
<td>• <code>bit0</code>: <code>LACP_Activity</code></td>
</tr>
<tr>
<td></td>
<td>• <code>bit1</code>: <code>LACP_Timeout</code></td>
</tr>
<tr>
<td></td>
<td>• <code>bit2</code>: Aggregation</td>
</tr>
<tr>
<td></td>
<td>• <code>bit3</code>: Synchronization</td>
</tr>
<tr>
<td></td>
<td>• <code>bit4</code>: Collecting</td>
</tr>
<tr>
<td></td>
<td>• <code>bit5</code>: Distributing</td>
</tr>
<tr>
<td></td>
<td>• <code>bit6</code>: Defaulted</td>
</tr>
<tr>
<td></td>
<td>• <code>bit7</code>: Expired</td>
</tr>
</tbody>
</table>
This example shows how to display LACP neighbors information for a specific port channel:

Switch# **show lacp 1 neighbor**

Flags:  S - Device sends PDUs at slow rate. F - Device sends PDUs at fast rate.
A - Device is in Active mode.       P - Device is in Passive mode.

<table>
<thead>
<tr>
<th>Channel group 1 neighbors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Fa4/1</td>
</tr>
<tr>
<td>Fa4/2</td>
</tr>
<tr>
<td>Fa4/3</td>
</tr>
<tr>
<td>Fa4/4</td>
</tr>
</tbody>
</table>

In the case where no PDUs have been received, the default administrative information is displayed in braces.

This example shows how to display the LACP system identification:

Switch> **show lacp sys-id**
8000,AC-12-34-56-78-90
Switch>

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>lacp port-priority</td>
<td>Sets the LACP priority for the physical interfaces.</td>
</tr>
<tr>
<td>lacp system-priority</td>
<td>Sets the priority of the system for LACP.</td>
</tr>
</tbody>
</table>
show license

To display information about the software license, use the `show license` command.

```
show license [agent | counters | session] | [all | detail | feature-name | feature | file | statistics | status | udi | right-to-use | summary | permanent | in-use | image levels | evaluation | expiring]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent</td>
<td>Shows information about the software license agent.</td>
</tr>
<tr>
<td>all</td>
<td>Shows information about all licenses in the system.</td>
</tr>
<tr>
<td>detail feature-name</td>
<td>Shows detailed information about a specified licensed feature or about all licenses.</td>
</tr>
<tr>
<td>feature</td>
<td>Shows a list of licensed features available in an image.</td>
</tr>
<tr>
<td>file</td>
<td>Shows license entries stored in the license file.</td>
</tr>
<tr>
<td>statistics</td>
<td>Shows license statistics information.</td>
</tr>
<tr>
<td>status</td>
<td>Shows information about supported license types and license operations, and provides device status.</td>
</tr>
<tr>
<td>udi</td>
<td>Shows all the unique device identifier (UDI) values that can be licensed in a system.</td>
</tr>
<tr>
<td>right-to-use</td>
<td>Shows all PRTU licenses.</td>
</tr>
<tr>
<td>summary</td>
<td>Shows a brief summary of all licenses.</td>
</tr>
<tr>
<td>permanent</td>
<td>Show all available permanent licenses.</td>
</tr>
<tr>
<td>in-use</td>
<td>Show all available in-use licenses.</td>
</tr>
<tr>
<td>image levels</td>
<td>Shows license image levels.</td>
</tr>
<tr>
<td>evaluation</td>
<td>Shows all evaluation licenses.</td>
</tr>
<tr>
<td>expiring</td>
<td>Shows all available expiring licenses.</td>
</tr>
</tbody>
</table>

**Defaults**

License-related information is not displayed

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOS XE 3.1.0</td>
<td>Support for <code>show license</code> introduced on the Catalyst 4500 Series Switches.</td>
</tr>
<tr>
<td>IOS XE 3.4.2</td>
<td>Keyword <code>right-to-use</code> introduced on the Catalyst 4500 Series Switches</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command to display license information and to help with troubleshooting issues related to Cisco IOS software licenses. It displays all the licenses in the system.

This command also displays those features that are available but not licensed to execute (i.e., multiple license can be active but not in use (execute) simultaneously). Only one type license can be used at a given time. Output is grouped according to how the features are stored in license storage (i.e., where license information is stored on the device).
These are examples of output from the `show license agent` command:

Switch# `show license agent counters`
License Agent Counters
Request Messages Received:0: Messages with Errors:0
Request Operations Received:0: Operations with Errors:0
Notification Messages Sent:1: Transmission Errors:0

Switch# `show license agent session`
License Agent Sessions: 0 open, maximum is 9

Switch# `show license ?`
agent show license agent
all Displays All The License(s).
call-home Show license call-home information
detail Displays Details Of A Given License.
evaluation Displays Evaluation License(s)
expiring Displays Expiring License(s).
feature Displays License Enabled Features.
file Displays All The License File(s).
handle show license handle
image show license image level
in-use Displays License That Are In-Use.
permanent Displays Permanent License(s)
right-to-use show permanent right-to-use licenses
statistics Displays License Statistics.
status Displays License Status.
summary Displays Brief Summary Of All License(s).
udi Displays UDI Value

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

Switch# `show license detail`
Index: 1 Feature: entservices Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
Store Index: 0
Store Name: Dynamic Evaluation License Storage
Index: 2 Feature: entservices Version: 1.0
License Type: PermanentRightToUse
License State: Inactive
License Count: Non-Counted
Store Index: 1
Store Name: Dynamic Evaluation License Storage
Index: 3 Feature: ipbase Version: 1.0
License Type: PermanentRightToUse
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
Store Index: 3
Store Name: Dynamic Evaluation License Storage
Index: 4 Feature: ipbase Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Inactive
License Count: Non-Counted
License Priority: Low
Store Index: 2
Store Name: Dynamic Evaluation License Storage
This is an example of output from the `show license detail entservices` command:

```
Switch# show license detail entservices
Feature: entservices Period Left: 8 weeks 3 days
Index: 1 Feature: entservices Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
Store Index: 0
Store Name: Dynamic Evaluation License Storage
Index: 2 Feature: entservices Version: 1.0
License Type: PermanentRightToUse
License State: Inactive
License Count: Non-Counted
Store Index: 1
Store Name: Dynamic Evaluation License Storage
```

This is an example of output from the `show license feature` command:

```
Switch# show license feature
entservices true true true false true
ipbase true true true true true
lanbase false false true false false
internal_service true false true false false
```

This is an example of output from the `show license file` command:

```
Switch# show license file
License Store: Primary License Storage
License Index: 1
License: 11 ipbase 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS NEVER NEVER Nil SLR_CODE CL_ND_LCK Nil *1DELA9KSFSXJAH400 Nil Nil Nil MINS WS-C4507 Series EntSNxwqJax7Dk6Qf5O725D xLt5q1e2VJl103pp3GSE3Prxwyf01, SLjP0SXu20q0f4pQTlxyc1pSQY5ix1j31f7ZT6AskJmyeUYh8sCUn191VKB8 S2sZ5XH12U0d99SH3mp9mnmhxFDmSo06xj9qX2qV: SAEQ81F18///kh44duxV+u+xjUP1zoc3++jPV9d8He4jOuba fbkm3motaAYoAb3inJL1l1yv50VCl1QwInX03s+nSlU77rOtDoXoIxYTAo3LMyUJ+MFpzaqlhcojV1YEvQ8H21MNUJ+Vb hoN0g2QVayjJaMBAQ1kVBQF2hr10GY01VzdzfJEFPQI6tZ++/Vtc/q3SF/5K08CY=
Comment: Hash: Z+EY3c6he1csQLvPRGC5NY5ypmds=
License Store: Dynamic License Storage
License Store: Primary License Storage
License Store: Dynamic License Storage
License Index: 0
License: 11 entservices 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE ADD INFINITE_KEYS
NEVER NEVER Nil SLR_CODE DEMO Nil Nil Nil MINS WS-C4507 Series EntSNxwqJax7Dk6Qf5O725D xLt5q1e2VJl103pp3GSE3Prxwyf01, SLjP0SXu20q0f4pQTlxyc1pSQY5ix1j31f7ZT6AskJmyeUYh8sCUn191VKB8 S2sZ5XH12U0d99SH3mp9mnmhxFDmSo06xj9qX2qV: SAEQ81F18///kh44duxV+u+xjUP1zoc3++jPV9d8He4jOuba fbkm3motaAYoAb3inJL1l1yv50VCl1QwInX03s+nSlU77rOtDoXoIxYTAo3LMyUJ+MFpzaqlhcojV1YEvQ8H21MNUJ+Vb hoN0g2QVayjJaMBAQ1kVBQF2hr10GY01VzdzfJEFPQI6tZ++/Vtc/q3SF/5K08CY=
Comment: Hash: RmO9Kum1d8BFKq0wCaX2CcUDE6rg=
License Store: Primary License Storage
License Store: Dynamic License Storage
License Store: Dynamic License Storage
License Index: 1
License: 12 entservices 1.0 LONG TRIAL DISABLED DISABLED STANDALONE ADD INFINITE_KEYS
NEVER NEVER Nil SLR_CODE DEMO Nil Nil Nil MINS WS-C4507 Series EntSNxwqJax7Dk6Qf5O725D xLt5q1e2VJl103pp3GSE3Prxwyf01, SLjP0SXu20q0f4pQTlxyc1pSQY5ix1j31f7ZT6AskJmyeUYh8sCUn191VKB8 S2sZ5XH12U0d99SH3mp9mnmhxFDmSo06xj9qX2qV: SAEQ81F18///kh44duxV+u+xjUP1zoc3++jPV9d8He4jOuba fbkm3motaAYoAb3inJL1l1yv50VCl1QwInX03s+nSlU77rOtDoXoIxYTAo3LMyUJ+MFpzaqlhcojV1YEvQ8H21MNUJ+Vb hoN0g2QVayjJaMBAQ1kVBQF2hr10GY01VzdzfJEFPQI6tZ++/Vtc/q3SF/5K08CY=
Comment: Hash: 9w09jAFGBPz1w6XOCl1jLOBe2p+y=
License Index: 2
License: 11 ipbase 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE ADD INFINITE KEYS
INFINITE KEYS NEVER NEVER NIL SLM_CODE DEMO NIL NIL NIL NIL 5_MINS NIL
YXNJUtp#FZic2Pdpt15JNVQ8CpQUBNc59tdkJ1TGkWnLTK:j:vmp,svKmIiyLWQfj$QAEBIf88//kagzg0R7bT5zn
6dVYVPUxyBlUub1GbkIhYo5D5JxH2/Bq1If9keNdSysePbUH5bvwIxtj0z3nsLi7r0tOxoiXYcAo3LYMu7+MFzsq
1hKoUVJ1yEv08Hs21MNjYVbhoN0gyTWayiJaM8AQ1KvBQFzhr10GYovzdzfJfEPQIx6tZ++/Vtc/q1SF/5Ko8XY=
Comment:
Hash: H62sXLV97TF1mTFPsm0tK4VH12Q=
License Index: 3
License: 12 ipbase 1.0 LONG TRIAL DISABLED STANDALONE ADD INFINITY KEYS
INFINITY KEYS 1 JAN 2006 1 JAN 2035 STANDALONE ADD INFINITE KEYS
INFINITE KEYS 1 JAN 2006 1 JAN 2035 STANDALONE ADD INFINITE KEYS
INFINITE KEYS NEVER NEVER NIL SLM_CODE DEMO NIL NIL NIL NIL 5_MINS
NOTLOCKED NOTLOCKED NOTLOCKED
Zh0GdZATxW6L2qg95ILo0cAazzbejJOl4HaqcySLeOvC1q,q04cTgs8gJbH003Bd0t0gEHog9degWj9bcjJ,mm
2jRa3qkxyk90b43WYbLA,mo3sQe:EF,TPJou8Pm:s:Tvrftc:ZubjuB0x0b6NPmSQAEBIf88//+08JwW1p3fj1tNl
AItc1Ix+D4NLXKnqyS1bJoxCM17xgw8BpmG5Q5y5nC1E14CPvVRQwInX0s+nsLY7r0t0x0iXYcAo3LYMu7+MPzsq
1hKoUVJ1yEv08Hs21MNjYVbhoN0gyTWayiJaM8AQ1KvBQFzhr10GYovzdzfJfEPQIx6tZ++/Vtc/q1SF/5Ko8XY=
Comment:
Hash: S3Ks+G07ueugA9hNMFpKdXTF12So=

This is an example of output from the show license statistics command:

Switch# show license statistics
Administrative statistics
Install success count: 4
Install failure count: 1
Install duplicate count: 0
Comment add count: 0
Comment delete count: 0
Clear count: 0
Save count: 0
Save cred count: 0
Client status Request success count 1 Request failure count 0 Release count 0 Global Notify count 1

This is an example of output from the show license status command:

Switch# show license status
License Type Supported
permanent Non-expiring node locked license
extension Expiring node locked license
evaluation Expiring non node locked license
License Operation Supported install Install license clear Clear license annotate Comment license save Save license revoke Revolve license call-home License call-home Call-home Operation Supported show pak Display license pak via call-home install Install license via call-home revolve Revolve license via call-home resend Fetch license via call-home Device status Device Credential type: IMAGE Device Credential Verification: PASS Rehost Type: DC_OR_IC

When you enter the show license udi command on WS-C4507R+E, this output appears:

Switch# show license udi
Device# PID SN UDI
*0 WS-C4507R+E FOX1327G52D WS-C4507R+E:FOX1327G52D

Note  The show license udi command output shows details on the current switch.

Displays all the Right to use licenses present on the device and their status. It contains license details: license state, licenses currently in use, and whether the EULA is accepted by the user.

Switch# show license right-to-use
License Store: Built-In License Storage
StoreIndex: 1 Feature: ipservices Version: 1.0
License Type: Permanent RightToUse
License State: Active, Not in Use, EULA accepted
   Period used: 1 hour 50 minutes
License Priority: High
License Count: Non-Counted

This is an example of the `show license summary` command:

```
Switch# show license summary
Index 0 Feature: entservices
   Period left: 8 weeks 3 days
   License Type: Evaluation
   License State: Active, Not in Use, EULA accepted
   License Count: Non-Counted
   License Priority: Low
Index 1 Feature: ipbase
   Period left: Life time
   License Type: Permanent
   License State: Active, In Use
   License Count: Non-Counted
   License Priority: Medium
Index 2 Feature: lanbase
   Period left: 0 seconds
Index 3 Feature: internal_service
   Period left: 0 seconds
```

This is an example of the `show license evaluation` command:

```
Switch# show license evaluation
License Store: Primary License Storage
License Store: Dynamic License Storage
StoreIndex: 0 Feature: entservices Version: 1.0
   License Type: Evaluation
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 3 days
   License State: Active, Not in Use, EULA accepted
   License Count: Non-Counted
   License Priority: Low
StoreIndex: 2 Feature: ipbase Version: 1.0
   License Type: Evaluation
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   License State: Inactive
   License Count: Non-Counted
   License Priority: None
```

This is an example of the `show license image levels` command:

```
Switch# show license image levels
Module name Image level Priority Configured Valid license
--|--|---|---
WS-X45-SUP7-E entservices 1 NO entservices
   ipbase 2 NO ipbase
   lanbase 3 NO lanbase
```
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
StoreIndex: 2 Feature: ipbase Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 4 days
License State: Inactive
License Count: Non-Counted
License Priority: None
Switch#

This is an example of the **show license in-use** command

Switch# **show license in-use**
License Store: Primary License Storage
StoreIndex: 1 Feature: ipbase Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
License Store: Dynamic License Storage
show mab

To display MAC authentication bypass (MAB) information, use the `show mab` command in EXEC mode.

```
show mab [interface interface interface-number | all] [detail]
```

### Syntax Description
- **interface interface** Interface type; possible valid value is `gigabitethernet`.
- **interface-number** Module and port number.
- **all** Displays MAB information for all interfaces.
- **detail** (Optional) Displays detailed MAB information.

### Command Default
None.

### Command Modes
Privileged EXEC mode

### Command History
- **12.2(50)SG** This command was introduced.

### Usage Guidelines
Table 2-36 lists the fields in the `show mab` command.

**Table 2-36  show mab Command Output**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac-Auth-Bypass</td>
<td>MAB state</td>
</tr>
<tr>
<td>Inactivity Timeout</td>
<td>Inactivity timeout</td>
</tr>
<tr>
<td>Client MAC</td>
<td>Client MAC address</td>
</tr>
<tr>
<td>MAB SM state</td>
<td>MAB state machine state</td>
</tr>
<tr>
<td>Auth Status</td>
<td>Authorization status</td>
</tr>
</tbody>
</table>

Table 2-37 lists the possible values for the state of the MAB state machine.

**Table 2-37  MAB State Machine Values**

<table>
<thead>
<tr>
<th>State</th>
<th>State Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initialize</td>
<td>Intermediate</td>
<td>The state of the session when it initializes</td>
</tr>
<tr>
<td>Acquiring</td>
<td>Intermediate</td>
<td>The state of the session when it is obtaining the client MAC address</td>
</tr>
</tbody>
</table>
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Table 2-37  MAB State Machine Values (continued)

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorizing</td>
<td>The state of the session during MAC-based authorization</td>
</tr>
<tr>
<td>Terminate</td>
<td>The state of the session once a result has been obtained. For a</td>
</tr>
<tr>
<td></td>
<td>session in terminal state, “TERMINATE” displays.</td>
</tr>
</tbody>
</table>

Table 2-38  lists the possible displayed values for the MAB authorization status.

Table 2-38  MAB Authorization Status Values

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTHORIZED</td>
<td>The session has successfully</td>
</tr>
<tr>
<td></td>
<td>authorized.</td>
</tr>
<tr>
<td>UNAUTHORIZED</td>
<td>The session has failed to be</td>
</tr>
<tr>
<td></td>
<td>authorized.</td>
</tr>
</tbody>
</table>

Examples

The following example shows how to display MAB information:

```
Switch# show mab all
MAB details for GigaEthernet1/3
-------------------------------------
Mac-Auth-Bypass = Enabled
Inactivity Timeout = None
Switch#
```

The following example shows how to display detailed MAB information:

```
Switch# show mab all detail
MAB details for GigaEthernet1/3
-------------------------------------
Mac-Auth-Bypass = Enabled
Inactivity Timeout = None
MAB Client List
---------------
Client MAC = 000f.23c4.a401
MAB SM state = TERMINATE
Auth Status = AUTHORIZED
```

The following example shows how to display MAB information for a specific interface:

```
Switch# show mab interface GigaEthernet1/3
MAB details for GigaEthernet1/3
-------------------------------------
Mac-Auth-Bypass = Enabled
Inactivity Timeout = None
```
The following example shows how to display detailed MAB information for a specific interface:

```
Switch# show mab interface gigabitethernet1/1 detail
MAB details for GigaEthernet1/1
-------------------------------------
Mac-Auth-Bypass = Enabled
Inactivity Timeout = None
MAB Client List
---------------
Client MAC = 000f.23c4.a401
MAB SM state = TERMINATE
Auth Status = AUTHORIZED
Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mab</td>
<td>Enables and configures MAC authorization bypass (MAB) on a port.</td>
</tr>
</tbody>
</table>
### show mac access-group interface

To display the ACL configuration on a Layer 2 interface, use the `show mac access-group interface` command.

```
show mac access-group interface [interface interface-number]
```

#### Syntax Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface</code></td>
<td>(Optional) Specifies the interface type; valid values are ethernet, fastethernet, gigabitethernet, tengigabitethernet, pos, atm, port-channel, and ge-wan.</td>
</tr>
<tr>
<td><code>interface-number</code></td>
<td>(Optional) Specifies the port number.</td>
</tr>
</tbody>
</table>

#### Defaults

This command has no default settings.

#### Command Modes

Privileged EXEC mode

#### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

#### Usage Guidelines

The valid values for the port number depend on the chassis used.

#### Examples

This example shows how to display the ACL configuration on interface fast 6/1:

```
Switch# show mac access-group interface fast 6/1
Interface FastEthernet6/1:
   Inbound access-list is simple-mac-acl
   Outbound access-list is not set
```

#### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>access-group mode</code></td>
<td>Specifies the override modes (for example, VACL overrides PACL) and the non-override modes (for example, merge or strict mode).</td>
</tr>
</tbody>
</table>
show mac-address-table address

To display MAC address table information for a specific MAC address, use the
show mac-address-table address command.

```
show mac-address-table address mac_addr [interface type slot/port | protocol protocol | vlan vlan_id]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mac_addr</strong></td>
<td>48-bit MAC address; the valid format is H.H.H.</td>
</tr>
<tr>
<td><strong>interface type slot/port</strong></td>
<td>(Optional) Displays information for a specific interface; valid values for type are fastethernet, gigabitethernet, and tengigabitethernet.</td>
</tr>
<tr>
<td><strong>protocol protocol</strong></td>
<td>(Optional) Specifies a protocol. See the “Usage Guidelines” section for more information.</td>
</tr>
<tr>
<td><strong>vlan vlan_id</strong></td>
<td>(Optional) Displays entries for the specific VLAN only; valid values are from 1 to 4094.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

For the MAC address table entries that are used by the routed ports, the routed port name is displayed in the “vlan” column not the internal VLAN number.

The keyword definitions for the `protocol` variable are as follows:

- **ip** specifies the IP protocol.
- **ipx** specifies the IPX protocols.
- **assigned** specifies the assigned protocol entries.
- **other** specifies the other protocol entries.
This example shows how to display MAC address table information for a specific MAC address:

Switch# **show mac-address-table address 0030.94fc.0dff**

### Unicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>protocols</th>
<th>port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0030.94fc.0dff</td>
<td>static ip,ipx,assigned,other</td>
<td>Switch</td>
<td></td>
</tr>
<tr>
<td>Fa6/1</td>
<td>0030.94fc.0dff</td>
<td>static ip,ipx,assigned,other</td>
<td>Switch</td>
<td></td>
</tr>
<tr>
<td>Fa6/2</td>
<td>0030.94fc.0dff</td>
<td>static ip,ipx,assigned,other</td>
<td>Switch</td>
<td></td>
</tr>
</tbody>
</table>

Switch#
show mac-address-table aging-time

To display the MAC address aging time, use the `show mac-address-table aging-time` command.

```
show mac-address-table aging-time [vlan vlan_id]
```

**Syntax Description**
- `vlan vlan_id` (Optional) Specifies a VLAN; valid values are from 1 to 4094.

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Support for extended addressing was added.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the currently configured aging time for all VLANs:

```
Switch# show mac-address-table aging-time
Vlan Aging Time
---- -----------
100  300
200  1000
Switch#
```

This example shows how to display the currently configured aging time for a specific VLAN:

```
Switch# show mac-address-table aging-time vlan 100
Vlan Aging Time
---- -----------
100  300
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mac-address-table address</td>
<td>Displays the information about the MAC-address table.</td>
</tr>
<tr>
<td>show mac-address-table count</td>
<td>Displays the number of entries currently in the MAC address table.</td>
</tr>
<tr>
<td>show mac-address-table dynamic</td>
<td>Displays the dynamic MAC address table entries only.</td>
</tr>
<tr>
<td>show mac-address-table interface</td>
<td>Displays the MAC address table information for a specific interface.</td>
</tr>
<tr>
<td>show mac-address-table multicast</td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
</tbody>
</table>
### Command Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mac-address-table protocol</code></td>
<td>Displays the MAC address table information that is based on the protocol.</td>
</tr>
<tr>
<td><code>show mac-address-table static</code></td>
<td>Displays the static MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac-address-table vlan</code></td>
<td>Displays information about the MAC address table for a specific VLAN.</td>
</tr>
</tbody>
</table>
show mac-address-table count

To display the number of entries currently in the MAC address table, use the `show mac-address-table count` command.

```
show mac-address-table count [vlan vlan_id]
```

**Syntax Description**

- `vlan vlan_id` (Optional) Specifies a VLAN; valid values are from 1 to 4094.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the entry count for a specific VLAN:

```
Switch# show mac-address-table count vlan 1
MAC Entries for Vlan 1:
Dynamic Unicast Address Count:                 0
Static Unicast Address (User-defined) Count:   0
Static Unicast Address (System-defined) Count: 1
Total Unicast MAC Addresses In Use:            1
Total Unicast MAC Addresses Available:         32768
Multicast MAC Address Count:                   1
Total Multicast MAC Addresses Available:       16384
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mac-address-table address</td>
<td>Displays the information about the MAC-address table.</td>
</tr>
<tr>
<td>show mac-address-table aging-time</td>
<td>Displays MAC address table aging information.</td>
</tr>
<tr>
<td>show mac-address-table dynamic</td>
<td>Displays the dynamic MAC address table entries only.</td>
</tr>
<tr>
<td>show mac-address-table interface</td>
<td>Displays the MAC address table information for a specific interface.</td>
</tr>
<tr>
<td>show mac-address-table multicast</td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
<tr>
<td>show mac-address-table protocol</td>
<td>Displays the MAC address table information that is based on the protocol.</td>
</tr>
</tbody>
</table>
### Command Reference

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mac-address-table static</code></td>
<td>Displays the static MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac-address-table vlan</code></td>
<td>Displays information about the MAC address table for a specific VLAN.</td>
</tr>
</tbody>
</table>
show mac-address-table dynamic

To display the dynamic MAC address table entries only, use the show mac-address-table dynamic command.

    show mac-address-table dynamic [address mac_addr | interface type slot/port | protocol protocol | vlan vlan_id]

Syntax Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>address mac_addr</td>
<td>(Optional) Specifies a 48-bit MAC address; the valid format is H.H.H.</td>
</tr>
<tr>
<td>interface type slot/port</td>
<td>(Optional) Specifies an interface to match; valid values for type are fastethernet, gigabitethernet, and tengigabitethernet.</td>
</tr>
<tr>
<td>protocol protocol</td>
<td>(Optional) Specifies a protocol. See the “Usage Guidelines” section for more information.</td>
</tr>
<tr>
<td>vlan vlan_id</td>
<td>(Optional) Displays entries for a specific VLAN; valid values are from 1 to 4094.</td>
</tr>
</tbody>
</table>

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

Usage Guidelines

The keyword definitions for the protocol argument are as follows:

- **assigned** specifies assigned protocol entries.
- **ip** specifies IP protocol.
- **ipx** specifies IPX protocols.
- **other** specifies other protocol entries.

The show mac-address-table dynamic command output for an EtherChannel interface changes the port number designation (such as, 5/7) to a port group number (such as, Po80).

For the MAC address table entries that are used by the routed ports, the routed port name is displayed in the “vlan” column not the internal VLAN number.
Examples

This example shows how to display all the dynamic MAC address entries:

```
Switch# show mac-address-table dynamic
Unicast Entries
  vlan  mac_address     type        protocols               port
  -------+---------------+--------+---------------------+-------------------
     1    0000.0000.0201   dynamic ip                     FastEthernet6/15
     1    0000.0000.0202   dynamic ip                     FastEthernet6/15
     1    0000.0000.0203   dynamic ip,assigned            FastEthernet6/15
     1    0000.0000.0204   dynamic ip,assigned            FastEthernet6/15
     1    0000.0000.0205   dynamic ip,assigned            FastEthernet6/15
     2    0000.0000.0101   dynamic ip                     FastEthernet6/16
     2    0000.0000.0102   dynamic ip                     FastEthernet6/16
     2    0000.0000.0103   dynamic ip,assigned            FastEthernet6/16
     2    0000.0000.0104   dynamic ip,assigned            FastEthernet6/16
     2    0000.0000.0105   dynamic ip,assigned            FastEthernet6/16
Switch#
```

This example shows how to display the dynamic MAC address entries with a specific protocol type (in this case, assigned):

```
Switch# show mac-address-table dynamic protocol assigned
Unicast Entries
  vlan  mac_address     type        protocols               port
  -------+---------------+--------+---------------------+-------------------
     1    0000.0000.0203   dynamic ip,assigned            FastEthernet6/15
     1    0000.0000.0204   dynamic ip,assigned            FastEthernet6/15
     1    0000.0000.0205   dynamic ip,assigned            FastEthernet6/15
     2    0000.0000.0103   dynamic ip,assigned            FastEthernet6/16
     2    0000.0000.0104   dynamic ip,assigned            FastEthernet6/16
     2    0000.0000.0105   dynamic ip,assigned            FastEthernet6/16
Switch#
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mac-address-table protocol</td>
<td>Displays the MAC address table information that is based on the protocol.</td>
</tr>
<tr>
<td>show mac-address-table static</td>
<td>Displays the static MAC address table entries only.</td>
</tr>
<tr>
<td>show mac-address-table vlan</td>
<td>Displays information about the MAC address table for a specific VLAN.</td>
</tr>
</tbody>
</table>
show mac-address-table interface

To display the MAC address table information for a specific interface, use the show mac-address-table interface command.

    show mac-address-table interface type slot/port

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>Interface type; valid values are ethernet, fastethernet, gigabitethernet, and tengigabitethernet.</td>
</tr>
<tr>
<td>slot/port</td>
<td>Number of the slot and port.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

For the MAC address table entries that are used by the routed ports, the routed port name is displayed in the “vlan” column not the internal VLAN number.

**Examples**

This example shows how to display MAC address table information for a specific interface:

```
Switch# show mac-address-table interface fastethernet6/16
Unicast Entries
  vlan  mac address  type  protocols  port
  ------------------------------------------
  2    0000.0000.0101  dynamic  other                      FastEthernet6/16
  2    0000.0000.0102  dynamic  other                      FastEthernet6/16
  2    0000.0000.0103  dynamic  other                      FastEthernet6/16
  2    0000.0000.0104  dynamic  other                      FastEthernet6/16
  2    0000.0000.0105  dynamic  other                      FastEthernet6/16
  2    0000.0000.0106  dynamic  other                      FastEthernet6/16

Multicast Entries
  vlan  mac address  type  ports
  ------------------------------------------
  2    ffff.ffff.ffff  system  Fa6/16
```

Switch#
### 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 the information about the MAC-address table.</td>
</tr>
<tr>
<td><code>show mac-address-table aging-time</code></td>
<td>Displays MAC address table aging information.</td>
</tr>
<tr>
<td><code>show mac-address-table count</code></td>
<td>Displays the number of entries currently in the MAC address table.</td>
</tr>
<tr>
<td><code>show mac-address-table dynamic</code></td>
<td>Displays the dynamic MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac-address-table multicast</code></td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
<tr>
<td><code>show mac-address-table protocol</code></td>
<td>Displays the MAC address table information that is based on the protocol.</td>
</tr>
<tr>
<td><code>show mac-address-table static</code></td>
<td>Displays the static MAC address table entries only.</td>
</tr>
<tr>
<td><code>show mac-address-table vlan</code></td>
<td>Displays information about the MAC address table for a specific VLAN.</td>
</tr>
</tbody>
</table>
Show MAC address-table learning

To display the status of MAC address learning for all VLANs or a specified VLAN, use the show mac address-table learning user EXEC command.

```
show mac address-table learning [vlan vlan-id] | [begin | exclude | include] expression
```

**Syntax Description**

- `vlan vlan-id` (Optional) Displays information for a specific VLAN. The range is 1 to 4094.
- `| begin` (Optional) Displays the line that matches the `expression`.
- `| exclude` (Optional) Displays excluded lines that match the `expression`.
- `| include` (Optional) Displays included lines that match the specified `expression`.
- `expression` (Optional) Specifies the expression in the output as a reference point.

**Defaults**

MAC address learning is enabled on all VLANs.

**Command Modes**

User EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>This command was modified to support the learning disable feature on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To display configured VLANs, and whether MAC address learning is enabled or disabled, use the show mac address-table learning command without keywords.

To display the learning status on an individual VLAN, use the command with a specific VLAN ID. Expressions are case sensitive. For example, if you enter `| exclude output`, the lines that contain output do not appear, but the lines that contain Output appear.

**Examples**

This example shows 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 multicast

To display information about the multicast MAC address table, use the `show mac-address-table multicast` command.

```
show mac-address-table multicast [count | {igmp-snooping [count]} | {user [count]} | {vlan vlan_num}]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>count</td>
<td>(Optional) Displays the number of multicast entries.</td>
</tr>
<tr>
<td>igmp-snooping</td>
<td>(Optional) Displays only the addresses learned by IGMP snooping.</td>
</tr>
<tr>
<td>user</td>
<td>(Optional) Displays only the user-entered static addresses.</td>
</tr>
<tr>
<td>vlan vlan_num</td>
<td>(Optional) Displays information for a specific VLAN only; valid values are from 1 to 4094.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

For the MAC address table entries that are used by the routed ports, the routed port name is displayed in the “vlan” column not the the internal VLAN number.

**Examples**

This example shows how to display multicast MAC address table information for a specific VLAN:

```
Switch# show mac-address-table multicast vlan 1
Multicast Entries
  vlan  mac address  type    ports
  ---  --------  -------  ---------------
  1    ffff.ffff.ffff  system  Switch,Fa6/15
Switch#
```

This example shows how to display the number of multicast MAC entries for all VLANs:

```
Switch# show mac-address-table multicast count
MAC Entries for all vlans:
  Multicast MAC Address Count: 141
  Total Multicast MAC Addresses Available: 16384
Switch#
```
Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mac-address-table address</td>
<td>Displays the information about the MAC-address table.</td>
</tr>
<tr>
<td>show mac-address-table aging-time</td>
<td>Displays MAC address table aging information.</td>
</tr>
<tr>
<td>show mac-address-table count</td>
<td>Displays the number of entries currently in the MAC address table.</td>
</tr>
<tr>
<td>show mac-address-table dynamic</td>
<td>Displays the dynamic MAC address table entries only.</td>
</tr>
<tr>
<td>show mac-address-table interface</td>
<td>Displays the MAC address table information for a specific interface.</td>
</tr>
<tr>
<td>show mac-address-table protocol</td>
<td>Displays the MAC address table information that is based on the protocol.</td>
</tr>
<tr>
<td>show mac-address-table static</td>
<td>Displays the static MAC address table entries only.</td>
</tr>
<tr>
<td>show mac-address-table vlan</td>
<td>Displays information about the MAC address table for a specific VLAN.</td>
</tr>
</tbody>
</table>
show mac-address-table notification

To display the MAC address table notification status and history, use the show mac-address-table notification command.

```
show mac-address-table notification [change] [interface [interface-id]] | [mac-move] | [threshold] | [learn-fail]
```

**Syntax Description**

- `change` (Optional) Displays the MAC address change notification status.
- `interface` (Optional) Displays MAC change information for an interface.
- `interface-id` (Optional) Displays the information for a specific interface. Valid interfaces include physical ports and port channels.
- `mac-move` (Optional) Displays MAC move notification status.
- `threshold` (Optional) Displays the MAC threshold notification status.
- `learn-fail` (Optional) Displays general information of hardware MAC learning failure notifications.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

```
Release          Modification
---------------  ---------------------------------------------
12.2(31)SG       Support for this command was introduced on the Catalyst 4500 series switch.
12.2(52)SG       Support for learn-fail keyword, Supervisor Engine 6-E, and Catalyst 4900M chassis added.
```

**Usage Guidelines**

Use the show mac-address-table notification change command to display the MAC change notification interval, the maximum number of entries allowed in the history table, the history table contents, and whether the MAC change feature is enabled or disabled.

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.

**Examples**

This example shows how to display all the MAC address notification information:

```
Switch# show mac-address-table notification change
MAC Notification Feature is Enabled on the switch
Interval between Notification Traps : 1 secs
Number of MAC Addresses Added : 5
Number of MAC Addresses Removed : 1
Number of Notifications sent to NMS : 3
Maximum Number of entries configured in History Table : 500
Current History Table Length : 3
MAC Notification Traps are Enabled
```
show mac-address-table notification

History Table contents
-----------------------------
History Index 1, Entry Timestamp 478433, Despatch Timestamp 478433
MAC Changed Message:
Operation: Added  Vlan: 1  MAC Addr: 1234.5678.9ab0  Dot1dBasePort: 323
History Index 2, Entry Timestamp 481834, Despatch Timestamp 481834
MAC Changed Message:
Operation: Added  Vlan: 1  MAC Addr: 1234.5678.9ab1  Dot1dBasePort: 323
Operation: Added  Vlan: 1  MAC Addr: 1234.5678.9ab2  Dot1dBasePort: 323
Operation: Added  Vlan: 1  MAC Addr: 1234.5678.9ab3  Dot1dBasePort: 323
History Index 3, Entry Timestamp 484334, Despatch Timestamp 484334
MAC Changed Message:
Operation: Deleted Vlan: 1  MAC Addr: 1234.5678.9ab0  Dot1dBasePort: 323
Switch#

This example shows how to display the MAC address change status on the FastEthernet interface 7/1:

Switch# show mac-address-table notification change interface FastEthernet 7/1
MAC Notification Feature is Enabled on the switch
Interface MAC Added Trap  MAC Removed Trap
---------- ----------------- -----------------
FastEthernet7/1 Enabled  Disabled
Switch#

This example shows how to display the MAC address move status:

Switch# show mac-address-table notification mac-move
MAC Move Notification: Enabled
Switch#

This example shows how to display the MAC address table utilization status:

Switch# show mac-address-table notification threshold
Status  limit  Interval
-------------+----------+----------
enabled  50  120
Switch#

This example shows how to display general information of MAC learning failure notifications:

Switch# show mac address-table notification learn-fail
Status  limit  Interval
-------------+----------+----------
disabled  2000  120

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear mac-address-table</td>
<td>Clears the address entries from the Layer 2 MAC address table.</td>
</tr>
<tr>
<td>mac-address-table notification</td>
<td>Enables MAC address notification on a switch.</td>
</tr>
<tr>
<td>snmp-server enable traps</td>
<td>Enables SNMP notifications (traps or informs).</td>
</tr>
<tr>
<td>snmp trap mac-notification change</td>
<td>Enables SNMP MAC address notifications.</td>
</tr>
</tbody>
</table>
show mac-address-table protocol

To display the MAC address table information that is based on the protocol, use the **show mac-address-table protocol** command.

```
show mac-address-table protocol {assigned | ip | ipx | other}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>assigned</td>
<td>Specifies the assigned protocol entries.</td>
</tr>
<tr>
<td>ip</td>
<td>Specifies the IP protocol entries.</td>
</tr>
<tr>
<td>ipx</td>
<td>Specifies the IPX protocol entries.</td>
</tr>
<tr>
<td>other</td>
<td>Specifies the other protocol entries.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

For the MAC address table entries that are used by the routed ports, the routed port name is displayed in the “vlan” column not the the internal VLAN number.

**Examples**

This example shows how to display the MAC address table entries that have a specific protocol type (in this case, assigned):

```
Switch# show mac-address-table protocol assigned
  vlan  mac address   type    protocol  qos             ports
  ------+------------------+---------+---------+---+----------------
  200   0050.3e8d.6400  static  assigned       -- Switch
  100   0050.3e8d.6400  static  assigned       -- Switch
   5   0050.3e8d.6400  static  assigned       -- Switch
 4092   0050.0000.0000  dynamic  assigned       -- Switch
   1  0050.3e8d.6400   static  assigned       -- Switch
   4  0050.3e8d.6400   static  assigned       -- Switch
 4092   0050.f0ac.3058  static  assigned       -- Switch
 4092   0050.f0ac.3059  dynamic  assigned       -- Switch
   1  0010.7b3b.0978   dynamic  assigned       -- Fa5/9
Switch#
```
This example shows the other output for the previous example:

Switch# show mac-address-table protocol other

Unicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>protocols</th>
<th>port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0000.0000.0201</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0000.0000.0202</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0000.0000.0203</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0000.0000.0204</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip, ipx, assigned, other</td>
<td>Switch</td>
</tr>
<tr>
<td>2</td>
<td>0000.0000.0101</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/16</td>
</tr>
<tr>
<td>2</td>
<td>0000.0000.0102</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/16</td>
</tr>
<tr>
<td>2</td>
<td>0000.0000.0103</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/16</td>
</tr>
<tr>
<td>2</td>
<td>0000.0000.0104</td>
<td>dynamic</td>
<td>other</td>
<td>FastEthernet6/16</td>
</tr>
<tr>
<td>Fa6/1</td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip, ipx, assigned, other</td>
<td>Switch</td>
</tr>
<tr>
<td>Fa6/2</td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip, ipx, assigned, other</td>
<td>Switch</td>
</tr>
</tbody>
</table>

Multicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/15</td>
</tr>
<tr>
<td>2</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Fa6/16</td>
</tr>
<tr>
<td>1002</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1003</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1004</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1005</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>Fa6/1</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/1</td>
</tr>
<tr>
<td>Fa6/2</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/2</td>
</tr>
</tbody>
</table>

Switch#

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mac-address-table address</td>
<td>Displays the information about the MAC-address table.</td>
</tr>
<tr>
<td>show mac-address-table aging-time</td>
<td>Displays MAC address table aging information.</td>
</tr>
<tr>
<td>show mac-address-table count</td>
<td>Displays the number of entries currently in the MAC address table.</td>
</tr>
<tr>
<td>show mac-address-table dynamic</td>
<td>Displays the dynamic MAC address table entries only.</td>
</tr>
<tr>
<td>show mac-address-table interface</td>
<td>Displays the MAC address table information for a specific interface.</td>
</tr>
<tr>
<td>show mac-address-table multicast</td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
<tr>
<td>show mac-address-table static</td>
<td>Displays the static MAC address table entries only.</td>
</tr>
<tr>
<td>show mac-address-table vlan</td>
<td>Displays information about the MAC address table for a specific VLAN.</td>
</tr>
</tbody>
</table>
show mac-address-table static

To display the static MAC address table entries only, use the `show mac-address-table static` command.

```
show mac-address-table static [address mac_addr | interface type number | protocol protocol | vlan vlan_id]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>address mac_addr</code></td>
<td>(Optional) Specifies a 48-bit MAC address to match; the valid format is H.H.H.</td>
</tr>
<tr>
<td><code>interface type number</code></td>
<td>(Optional) Specifies an interface to match; valid values for <code>type</code> are fastethernet, gigabitethernet, and tengigabitethernet.</td>
</tr>
<tr>
<td><code>protocol protocol</code></td>
<td>(Optional) Specifies a protocol. See the “Usage Guidelines” section for more information.</td>
</tr>
<tr>
<td><code>vlan vlan_id</code></td>
<td>(Optional) Displays the entries for a specific VLAN; valid values are from 1 to 4094.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

For the MAC address table entries that are used by the routed ports, the routed port name is displayed in the “vlan” column not the internal VLAN number.

The keyword definitions for the `protocol` argument are as follows:

- **assigned** specifies the assigned protocol entries.
- **ip** specifies the IP protocol.
- **ipx** specifies the IPX protocols.
- **other** specifies the other protocol entries.
This example shows how to display all the static MAC address entries:

Switch# `show mac-address-table static`

Unicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>protocols</th>
<th>port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip,ipx,assigned,other</td>
<td>Switch</td>
</tr>
<tr>
<td>Fa6/1</td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip,ipx,assigned,other</td>
<td>Switch</td>
</tr>
<tr>
<td>Fa6/2</td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip,ipx,assigned,other</td>
<td>Switch</td>
</tr>
</tbody>
</table>

Multicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>ports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/15</td>
</tr>
<tr>
<td>2</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Fa6/16</td>
</tr>
<tr>
<td>1002</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1003</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1004</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1005</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>Fa6/1</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/1</td>
</tr>
<tr>
<td>Fa6/2</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/2</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the static MAC address entries with a specific protocol type (in this case, assigned):

Switch# `show mac-address-table static protocol assigned`

Unicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>protocols</th>
<th>port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip,ipx,assigned,other</td>
<td>Switch</td>
</tr>
<tr>
<td>Fa6/1</td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip,ipx,assigned,other</td>
<td>Switch</td>
</tr>
<tr>
<td>Fa6/2</td>
<td>0030.94fc.0dff</td>
<td>static</td>
<td>ip,ipx,assigned,other</td>
<td>Switch</td>
</tr>
</tbody>
</table>

Multicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>ports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/15</td>
</tr>
<tr>
<td>2</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Fa6/16</td>
</tr>
<tr>
<td>1002</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1003</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1004</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>1005</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>Fa6/1</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/1</td>
</tr>
<tr>
<td>Fa6/2</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/2</td>
</tr>
</tbody>
</table>

Switch#

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 the information about the MAC-address table.</td>
</tr>
<tr>
<td><code>show mac-address-table aging-time</code></td>
<td>Displays MAC address table aging information.</td>
</tr>
<tr>
<td><code>show mac-address-table count</code></td>
<td>Displays the number of entries currently in the MAC address table.</td>
</tr>
<tr>
<td><code>show mac-address-table dynamic</code></td>
<td>Displays the 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 a specific interface.</td>
</tr>
</tbody>
</table>
### Command Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mac-address-table multicast</code></td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
<tr>
<td><code>show mac-address-table protocol</code></td>
<td>Displays the MAC address table information that is based on the protocol.</td>
</tr>
<tr>
<td><code>show mac-address-table vlan</code></td>
<td>Displays information about the MAC address table for a specific VLAN.</td>
</tr>
</tbody>
</table>
show mac-address-table vlan

To display information about the MAC address table for a specific VLAN, use the `show mac-address-table vlan` command.

```
show mac-address-table [vlan vlan_id] [protocol protocol]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vlan vlan_id</code></td>
<td>(Optional) Displays the entries for a specific VLAN; valid values are from 1 to 4094.</td>
</tr>
<tr>
<td><code>protocol protocol</code></td>
<td>(Optional) Specifies a protocol. See the “Usage Guidelines” section for more information.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Support for extended addressing was added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

For the MAC address table entries used by the routed ports, the routed port name is displayed in the “vlan” column not the internal VLAN number.

The keyword definitions for the `protocol` variable are as follows:

- **assigned** specifies the assigned protocol entries.
- **ip** specifies the IP protocol.
- **ipx** specifies the IPX protocols.
- **other** specifies the other protocol entries.
Examples

This example shows how to display information about the MAC address table for a specific VLAN:

Switch# `show mac-address-table vlan 1`

Unicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>protocols</th>
<th>port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0000.0000.0201</td>
<td>dynamic ip</td>
<td></td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0000.0000.0202</td>
<td>dynamic ip</td>
<td></td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0000.0000.0203</td>
<td>dynamic other</td>
<td></td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0000.0000.0204</td>
<td>dynamic other</td>
<td></td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0030.94fc.0dff</td>
<td>static ip,ipx,assigned,other</td>
<td>Switch</td>
<td></td>
</tr>
</tbody>
</table>

Multicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/15</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display MAC address table information for a specific protocol type:

Switch# `show mac-address-table vlan 100 protocol other`

Unicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>protocols</th>
<th>port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0000.0000.0203</td>
<td>dynamic other</td>
<td></td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0000.0000.0204</td>
<td>dynamic other</td>
<td></td>
<td>FastEthernet6/15</td>
</tr>
<tr>
<td>1</td>
<td>0030.94fc.0dff</td>
<td>static ip,ipx,assigned,other</td>
<td>Switch</td>
<td></td>
</tr>
</tbody>
</table>

Multicast Entries

<table>
<thead>
<tr>
<th>vlan</th>
<th>mac address</th>
<th>type</th>
<th>ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ffff.ffff.ffff</td>
<td>system</td>
<td>Switch,Fa6/15</td>
</tr>
</tbody>
</table>

Switch#

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 the information about the MAC-address table.</td>
</tr>
<tr>
<td><code>show mac-address-table aging-time</code></td>
<td>Displays MAC address table aging information.</td>
</tr>
<tr>
<td><code>show mac-address-table count</code></td>
<td>Displays the number of entries currently in the MAC address table.</td>
</tr>
<tr>
<td><code>show mac-address-table dynamic</code></td>
<td>Displays the 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 a specific interface.</td>
</tr>
<tr>
<td><code>show mac-address-table multicast</code></td>
<td>Displays information about the multicast MAC address table.</td>
</tr>
<tr>
<td><code>show mac-address-table protocol</code></td>
<td>Displays the MAC address table information that is based on the protocol.</td>
</tr>
<tr>
<td><code>show mac-address-table static</code></td>
<td>Displays the static MAC address table entries only.</td>
</tr>
</tbody>
</table>
show macro auto mac-address-group

Use the `show macro auto mac-address-group` command to display the configuration of MAC address group.

```
show macro auto mac-address-group
```

**Syntax Description**
No keywords

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the configuration of the MAC address group:

```
Switch# show macro auto address-group
MAC Address Group Configuration:

<table>
<thead>
<tr>
<th>Group Name</th>
<th>OUI</th>
<th>MAC ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>testGroup</td>
<td>2222.2222.2222</td>
<td>1111.1111.1111</td>
</tr>
</tbody>
</table>
```

show macro auto device

Use the `show macro auto device` global configuration command to display the default information for a device, including built-in function name and the parameters that can be provided for the commands when executing the built-in function.

```
show macro auto device device_id
```

**Syntax Description**

- `device_id` Specifies the device ID.

**Defaults**

None

**Command Modes**

Global configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command displays the default values as well as the currently used values if configured.

**Examples**

This example shows how to display the default information for the device access-point:

```
Switch# show macro auto device access-point
Device: access-point
Default Macro: CISCO_AP_AUTO_SMARTPORT
Current Macro: CISCO_AP_AUTO_SMARTPORT
Configurable Parameters : NATIVE_VLAN
Defaults Parameters : NATIVE_VLAN = 1
Current Parameters : NATIVE_VLAN = 1
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show macro auto event manager</td>
<td>Refer to the Command Reference in the IOS library</td>
</tr>
<tr>
<td>show macro auto interface</td>
<td>Display Auto SmartPorts status and the functions applied on an interface.</td>
</tr>
</tbody>
</table>
show macro auto interface

Use the `show macro auto interface` command to display Auto SmartPorts status and the functions applied on an interface.

```
show macro auto interface interface_id
```

**Syntax Description**

| `interface_id` | Specifies an interface ID. |

**Defaults**

None

**Command Modes**

Global configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display Auto SmartPorts status and the applied macros:

```
Switch# show macro auto int gi3/8
Global Auto Smart Port Status
Auto Smart Ports Enabled
Fallback : CDP Disabled, LLDP Disabled
Interface     Auto Smart Port   Fallback    Macro Description(s)
--------------------------------------------------------------
Gi3/8          TRUE              None        CISCO_PHONE_EVENT
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show macro auto device</code></td>
<td>Displays the default information for a device, including builtin function name and the parameters that can be provided for the commands when executing the builtin function.</td>
</tr>
</tbody>
</table>
show macro auto monitor clients

To display the clients using the device classifier facility on the switch, use the show macro auto monitor clients user EXEC command.

show macro auto monitor clients

Syntax Description
This command has no arguments or keywords.

Command Default
User EXEC
Privileged EXEC

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release IOS XE 3.3.0 SG (15.1(1)SG)</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

Usage Guidelines
Device classifier (DC) is enabled by default when you enable a client application (for example, Auto Smartports) that uses its functionality. Use the show macro auto monitor clients command to display the clients that are using the DC feature on the switch.

As long as any clients are using the DC, you cannot disable it by using the no macro auto monitor command. If you attempt to disable the DC while a client is using it, an error message appears.

Examples
This example shows how to use the show macro auto monitor clients privileged EXEC command to view the clients using the DC on the switch:

Switch# show macro auto monitor clients
Client Name
====================================
Auto Smart Ports

This example shows the error message that appears when you attempt to disable DC while a client is using it:

Switch(config)# no macro auto monitor
These subsystems should be disabled before disabling Device classifier
Auto Smart Ports

% Error - device classifier is not disabled

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>macro auto device</td>
<td>Configures macro default parameter values.</td>
</tr>
<tr>
<td>macro auto execute (built-in function)</td>
<td>Configures mapping from an event trigger to a built-in macro.</td>
</tr>
<tr>
<td>macro auto global processing</td>
<td>Enables Auto Smartports on a switch.</td>
</tr>
</tbody>
</table>
### Command Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>macro auto mac-address-group</code></td>
<td>Configures MAC address groups.</td>
</tr>
<tr>
<td><code>macro auto sticky</code></td>
<td>Configures macro persistence.</td>
</tr>
<tr>
<td><code>shell trigger</code></td>
<td>Creates event triggers.</td>
</tr>
<tr>
<td><code>show macro auto monitor type</code></td>
<td>Displays all the device types recognized by the device classifier.</td>
</tr>
<tr>
<td><code>show shell triggers</code></td>
<td>Displays information about event triggers and macros.</td>
</tr>
</tbody>
</table>
show macro auto monitor device

To display the devices connected to a switch and their associated properties, use the `show macro auto monitor device` user EXEC command.

```
show macro auto monitor device [detail | filter string | interface interface_id | mac-address mac_address]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>detail</td>
<td>Displays detailed device classifier information.</td>
</tr>
<tr>
<td>filter string</td>
<td>Displays information for devices that match the filter.</td>
</tr>
<tr>
<td>interface interface_id</td>
<td>Displays information about devices attached to the specified interface.</td>
</tr>
<tr>
<td>mac mac_address</td>
<td>Displays device information for the specified endpoint.</td>
</tr>
</tbody>
</table>

**Command Modes**

User EXEC
Privileged EXEC

**Command History**

- **Release IOS XE 3.3.0 SG (15.1(1)SG)**
  - This command was introduced on the Catalyst 4500 series switch.

**Usage Guidelines**

Use this command to display the devices connected to a switch. Use the `show macro auto device` privileged EXEC command to display the configurable parameters for a device.

**Examples**

This example shows how to use the `show macro auto monitor device` privileged EXEC command with no optional keywords to view the devices connected to the switch:

```
Switch# show macro auto monitor device
MAC_Address           Port_Id          Profile Name
====================    =======     ============================
000a.b8c6.1e07    Gi1/0/2    Cisco-Device
001f.9e90.1250    Gi1/0/4    Cisco-AP-Aironet-1130
```

This example shows how to use the `show macro auto monitor device` privileged EXEC command with the optional `mac-address` keyword to view summary information about the connected device with the specified MAC address:

```
Switch# show macro auto monitor device mac-address 001f.9e90.1250
MAC_Address       Port_Id     Profile Name
==============    =======     ============================
001f.9e90.1250    Gi1/0/4    Cisco-AP-Aironet-1130
```
This example shows how to use the `show macro auto monitor device` privileged EXEC command with the optional `mac-address` and `detail` keywords to view detailed information about the connected device with the specified MAC address:

```
Switch# show macro auto monitor device mac-address 001f.9e90.1250 detail
MAC_Address       Port_Id     Certainty Parent    ProfileType  Profile Name
Device_Name
===============    =======     ========= ======    ===========
001f.9e90.1250    Gi1/0/4      40       2        Built-in       Cisco-AP-Aironet-1130
cisco AIR-LAP1131AG-E-K9
```

This example shows how to use the `show macro auto monitor device` privileged EXEC command with the optional `interface` keyword to view summary information about the device connected to the specified interface:

```
Switch# show macro auto monitor device interface gi 1/0/2
MAC_Address       Port_Id     Profile Name
Device_Name
===============    =======     ============================
000a.b8c6.1e07    Gi1/0/2    Cisco-Device
```

This example shows how to use the `show macro auto monitor device` privileged EXEC command with the optional `interface` and `detail` keywords to view detailed information about the device connected to the specified interface:

```
Switch# show macro auto monitor device interface gi 1/0/2 detail
MAC_Address       Port_Id     Certainty Parent    ProfileType  Profile Name
Device_Name
===============    =======     ========= ======    ===========
000a.b8c6.1e07    Gi1/0/2      10       0        Default       Cisco-Device        cisco
WS-C2960-48TT-L
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>macro auto device</code></td>
<td>Configures macro default parameter values.</td>
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</tr>
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<td>Configures MAC address groups.</td>
</tr>
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</tr>
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<td>Creates event triggers.</td>
</tr>
<tr>
<td><code>show macro auto monitor clients</code></td>
<td>Displays all the device types recognized by the device classifier.</td>
</tr>
<tr>
<td><code>show macro auto monitor type</code></td>
<td>Displays all the device types recognized by the device classifier.</td>
</tr>
<tr>
<td><code>show shell triggers</code></td>
<td>Displays information about event triggers and macros.</td>
</tr>
</tbody>
</table>
show macro auto monitor type

To display all the device types recognized by the device classifier, use the `show macro auto monitor type` user EXEC command.

```
show macro auto monitor type [table [built-in | default] | string filter_string]
```

### Syntax Description

**table**
- Displays device classification in a table.

**built-in**
- Displays device classification information from the built-in device table.

**default**
- Displays device classification information from the default device table.

**filter string**
- Displays information for devices that match the filter.

### Command Modes

- User EXEC
- Privileged EXEC

### Command History

- **Release IOS XE 3.3.0 SG (15.1(1)SG)**
  - This command was introduced on the Catalyst 4500 series switch.

### Usage Guidelines

This command displays all the device types recognized by the device classification engine. The number of available device types is the number of profiles stored on the switch. Because the number of profiles can be very large, you can use the `filter` keyword to limit the command output.

### Examples

This example shows how to use the `show macro auto monitor type` privileged EXEC command with no optional keywords to view the devices recognized by the device classifier:

```
Switch# show macro auto monitor type table
Valid  Type   Profile Name                  min Conf ID
======  =======  ==================        ======== ====
Valid   Default  Apple-Device              10        0
Valid   Default  Aruba-Device              10        1
Valid   Default  Avaya-Device               10        2
Valid   Default  Avaya-IP-Phone             20        3
Valid   Default  BlackBerry                 20        4
Valid   Default  Cisco-Device               10        5
Valid   Default  Cisco-IP-Phone             20        6
Valid   Default  Cisco-IP-Phone-7902        70        7
Valid   Default  Cisco-IP-Phone-7905        70        8
Valid   Default  Cisco-IP-Phone-7906        70        9
Valid   Default  Cisco-IP-Phone-7910        70       10
Valid   Default  Cisco-IP-Phone-7911        70       11
Valid   Default  Cisco-IP-Phone-7912        70       12
Valid   Default  Cisco-IP-Phone-7940        70       13
Valid   Default  Cisco-IP-Phone-7941        70       14
Valid   Default  Cisco-IP-Phone-7942        70       15
```
<table>
<thead>
<tr>
<th>Status</th>
<th>Type</th>
<th>Type Description</th>
<th>Weight</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7945</td>
<td>70</td>
<td>16</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7945G</td>
<td>70</td>
<td>17</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7960</td>
<td>70</td>
<td>18</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7961</td>
<td>70</td>
<td>19</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7962</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7965</td>
<td>70</td>
<td>21</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7970</td>
<td>70</td>
<td>22</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7971</td>
<td>70</td>
<td>23</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7975</td>
<td>70</td>
<td>24</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7985</td>
<td>70</td>
<td>25</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-9971</td>
<td>70</td>
<td>26</td>
</tr>
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<td>Default</td>
<td>Cisco-WLC-2100-Series</td>
<td>40</td>
<td>27</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>DLink-Device</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Enterasys-Device</td>
<td>10</td>
<td>29</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>HP-Device</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>HP-JetDirect-Printer</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Lexmark-Device</td>
<td>10</td>
<td>32</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Lexmark-Printer-E260dn</td>
<td>30</td>
<td>33</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Microsoft-Device</td>
<td>10</td>
<td>34</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Netgear-Device</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>NintendoWII</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Nortel-Device</td>
<td>10</td>
<td>37</td>
</tr>
<tr>
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<td>Default</td>
<td>Nortel-IP-Phone-2000-Series</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>SonyPS3</td>
<td>10</td>
<td>39</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>XBOX360</td>
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<td>Default</td>
<td>Xerox-Device</td>
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</tr>
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<td>Default</td>
<td>Xerox-Printer-Phaser3250</td>
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<td>42</td>
</tr>
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<td>Valid</td>
<td>Default</td>
<td>Aruba-AP</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
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<td>Default</td>
<td>Cisco-AccessPoint</td>
<td>10</td>
<td>44</td>
</tr>
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<td>Default</td>
<td>Cisco-IP-Phone-7935</td>
<td>70</td>
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</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7936</td>
<td>70</td>
<td>46</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-IP-Phone-7937</td>
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<tr>
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<td>Default</td>
<td>DLink-DAP-1522</td>
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<td>48</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-AP-Aironet-1130</td>
<td>30</td>
<td>49</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-AP-Aironet-1240</td>
<td>30</td>
<td>50</td>
</tr>
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<td>Default</td>
<td>Cisco-AP-Aironet-1250</td>
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</tr>
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<td>Default</td>
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<td>25</td>
<td>52</td>
</tr>
<tr>
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<td>Default</td>
<td>Cisco-AIR-LAP-1130</td>
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<tr>
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<td>Default</td>
<td>Cisco-AIR-LAP-1240</td>
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</tr>
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<td>Default</td>
<td>Cisco-AIR-LAP-1250</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
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<td>Default</td>
<td>Cisco-AIR-AP</td>
<td>25</td>
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<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-AIR-AP-1130</td>
<td>30</td>
<td>57</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-AIR-AP-1240</td>
<td>50</td>
<td>58</td>
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<tr>
<td>Valid</td>
<td>Default</td>
<td>Cisco-AIR-AP-1250</td>
<td>50</td>
<td>59</td>
</tr>
<tr>
<td>Invalid</td>
<td>Default</td>
<td>Sun-Workstation</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>LinksysWAP54G-Device</td>
<td>30</td>
<td>62</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>HTC-Device</td>
<td>10</td>
<td>63</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>MotorolaMobile-Device</td>
<td>10</td>
<td>64</td>
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<tr>
<td>Valid</td>
<td>Default</td>
<td>VMware-Device</td>
<td>10</td>
<td>65</td>
</tr>
<tr>
<td>Valid</td>
<td>Default</td>
<td>ISE-Appliance</td>
<td>10</td>
<td>66</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-Device</td>
<td>10</td>
<td>68</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-Router</td>
<td>10</td>
<td>69</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-IP-Camera-2xxx</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-IP-Camera-2421</td>
<td>50</td>
<td>71</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-IP-Camera-2500</td>
<td>50</td>
<td>72</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-IP-Camera-2520</td>
<td>50</td>
<td>73</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-IP-Camera-2530</td>
<td>50</td>
<td>74</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-IP-Camera-4XXX</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-Transparent-Bridge</td>
<td>8</td>
<td>76</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Transparent-Bridge</td>
<td>8</td>
<td>77</td>
</tr>
<tr>
<td>Valid</td>
<td>Built-in</td>
<td>Cisco-Source-Bridge</td>
<td>10</td>
<td>78</td>
</tr>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>macro auto device</code></td>
<td>Configures macro default parameter values.</td>
</tr>
<tr>
<td><code>macro auto execute (built-in function)</code></td>
<td>Configures mapping from an event trigger to a built-in macro.</td>
</tr>
<tr>
<td><code>macro auto global processing</code></td>
<td>Enables Auto Smartports on a switch.</td>
</tr>
<tr>
<td><code>macro auto mac-address-group</code></td>
<td>Configures MAC address groups.</td>
</tr>
<tr>
<td><code>macro auto sticky</code></td>
<td>Configures macro persistence.</td>
</tr>
<tr>
<td><code>shell trigger</code></td>
<td>Creates event triggers.</td>
</tr>
<tr>
<td><code>show macro auto monitor clients</code></td>
<td>Displays all the device types recognized by the device classifier.</td>
</tr>
<tr>
<td><code>show macro auto monitor device</code></td>
<td>Displays all the device types recognized by the device classifier.</td>
</tr>
</tbody>
</table>
show module

To display information about the module, use the show module command.

```
show module [mod | all]
```

### Syntax Description

- **mod**  
  (Optional) Number of the module; valid values vary from chassis to chassis.

- **all**  
  (Optional) Displays information for all modules.

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Enhanced the output of the <code>show idprom interface</code> command to include the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

In the Mod Sub-Module fields in the command output, the `show module` command displays the supervisor engine number but appends the uplink daughter card’s module type and information.

If the PoE consumed by the module is more than 50 W above the administratively allocated PoE, the “Status” displays as “PwrOver.” If the PoE consumed by the module is more than 50 W above the PoE module limit, the “Status” displays as “PwrFault.”

### Examples

This example shows how to display information for all the modules.

This example shows the `show module` command output for a system with inadequate power for all installed modules. The system does not have enough power for Module 5; the “Status” displays it as “PwrDeny.”

```
Switch# show module all

<table>
<thead>
<tr>
<th>Mod</th>
<th>Ports</th>
<th>Card Type</th>
<th>Model</th>
<th>Serial No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1000BaseX (GBIC) Supervisor(active)</td>
<td>WS-X4014</td>
<td>JAB054109GH</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>1000BaseX (GBIC)</td>
<td>WS-X4306</td>
<td>00000110</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>1000BaseX (GBIC)</td>
<td>WS-X4418</td>
<td>JAB025104WK</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>Not enough power for module</td>
<td>WS-X4148-FX-MT</td>
<td>0000000000</td>
</tr>
<tr>
<td>6</td>
<td>48</td>
<td>10/100BaseTX (RJ45)</td>
<td>WS-X4148</td>
<td>JAB023402RP</td>
</tr>
</tbody>
</table>

MAC addresses: | Hw | Fw | Sw | Status |
--- | --- | --- | --- | -------|
1 005c.9d1a.f9d0 to 005c.9d1a.f9df | 0.5 | 12.1(11br)EW | 12.1(20020313:00 | Ok |
2 0010.7bab.9920 to 0010.7bab.9925 | 0.2 | | | Ok |
3 0050.7356.2b36 to 0050.7356.2b47 | 1.0 | | | Ok |
5 0001.6dfe.a930 to 0001.6dfe.a95f | 0.0 | | | PwrDeny |
```
This example shows how to display information for a specific module:

```plaintext
Switch# show module mod2

<table>
<thead>
<tr>
<th>Mod</th>
<th>Ports</th>
<th>Card Type</th>
<th>Model</th>
<th>Serial No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>Catalyst 4000 supervisor 2 (Active)</td>
<td>WS-X6K-SUP2-2GE</td>
<td>SAD04450LF1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mod</th>
<th>MAC addresses</th>
<th>Hw</th>
<th>Fw</th>
<th>Sw</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0001.6461.39c0 to 0001.6461.39c1</td>
<td>1.1</td>
<td>6.1(3)</td>
<td>6.2(0.97)</td>
<td>Ok</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mod Sub-Module</th>
<th>Model</th>
<th>Serial</th>
<th>Hw</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Policy Feature Card 2</td>
<td>WS-F6K-PFC2</td>
<td>SAD04440HVU</td>
<td>1.0</td>
<td>Ok</td>
</tr>
<tr>
<td>2 Cat4k MSFC 2 daughterboard</td>
<td>WS-F6K-MSFC2</td>
<td>SAD04430J9K</td>
<td>1.1</td>
<td>Ok</td>
</tr>
</tbody>
</table>
```

This example shows how to display information for all the modules on the switch:

```plaintext
Switch# show module

<table>
<thead>
<tr>
<th>Mod</th>
<th>Ports</th>
<th>Card Type</th>
<th>Model</th>
<th>Serial No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>XG (X2), 1000BaseX (SFP) Supervisor (ac)</td>
<td>WS-X4517</td>
<td>**</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>1000BaseX (GBIC)</td>
<td>WS-X4306</td>
<td>00000110</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mod</th>
<th>MAC addresses</th>
<th>Hw</th>
<th>Fw</th>
<th>Sw</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0004.6d46.7700 to 0004.6d46.7705</td>
<td>0.0</td>
<td>12.2(20r)</td>
<td>12.2(20040513:16)</td>
<td>Ok</td>
</tr>
<tr>
<td>3</td>
<td>0010.7bab.9920 to 0010.7bab.9925</td>
<td>0.2</td>
<td>Ok</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

Switch#
show monitor

To display information about the SPAN session, use the `show monitor` command.

```
show monitor [session] [range session-range | local | remote | all | session-number] [detail]
```

**Syntax Description**

- `session` (Optional) Displays the SPAN information for a session.
- `range` (Optional) Displays information for a range of sessions.
- `session-range` (Optional) Specifies a range of sessions.
- `local` (Optional) Displays all local SPAN sessions.
- `remote` (Optional) Displays the RSPAN source and destination sessions.
- `all` (Optional) Displays the SPAN and RSPAN sessions.
- `session-number` (Optional) Session number; valid values are from 1 to 6.
- `detail` (Optional) Displays the detailed SPAN information for a session.

**Defaults**

The `detail` keyword only displays lines with a nondefault configuration.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(13)EW</td>
<td>Added support for differing directions within a single user session.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Output enhanced to display configuration status of SPAN enhancements.</td>
</tr>
<tr>
<td>12.1(20)EW</td>
<td>Added support to display configuration state for remote SPAN and learning.</td>
</tr>
<tr>
<td>12.2(20)EW</td>
<td>Added support to display ACLs that are applied to SPAN sessions.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display whether ACLs are applied to a given SPAN session on a Catalyst 4500 series switch:

```
Switch# show monitor

Session 1
--------
Type : Local Session
Source Ports :
    Both : Fa6/1
Destination Ports : Fa6/2
    Encapsulation : Native
    Ingress : Disabled
    Learning : Disabled
Filter VLANs : 1
IP Access-group : 10
```
This example shows how to display SPAN information for session 2:

```
Switch# show monitor session 2
Session 2
-------------
Type : Remote Source Session
Source Ports:
        RX Only:        Fa1/1-3
Dest RSPAN VLAN:  901
Ingress : Enabled, default VLAN=2
Learning : Disabled
Switch#
```

This example shows how to display the detailed SPAN information for session 1:

```
Switch# show monitor session 1 detail
Session 1
---------
Type              : Local Session
Source Ports      :
        RX Only       : None
        TX Only       : None
        Both          : Gi1/1, CPU
Source VLANs      :
        RX Only       : None
        TX Only       : None
        Both          : None
Source RSPAN VLAN : Fa6/1
Destination Ports : Fa6/1
    Encapsulation : DOT1Q
        Ingress : Enabled, default VLAN = 2
Filter VLANs      : None
    Filter Types RX : Good
    Filter Types TX : None
Dest Rspan Vlan : 901
Ingress : Enabled, default VLAN=2
Learning : Disabled
IP Access-group : None
Switch#
```

This example shows how to display SPAN information for session 1 beginning with the line that starts with Destination:

```
Switch# show monitor session 1 | begin Destination
Destination Ports: None
Filter VLANs:      None
Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>monitor session</td>
<td>Enables the SPAN sessions on interfaces or VLANs.</td>
</tr>
</tbody>
</table>
**show monitor capture**

To display the capture point details, so that you can see what capture points are defined, what their attributes are, and whether they are active, use the `show monitor capture` command.

```
show monitor capture [name [parameter] | buffer [brief | detailed | dump]]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>name</strong></td>
<td>Specifies the capture point name.</td>
</tr>
<tr>
<td><strong>parameter</strong></td>
<td>Reconstruc ts and displays the exec commands for specifying the capture point.</td>
</tr>
<tr>
<td>**buffer [brief</td>
<td>Detailed</td>
</tr>
</tbody>
</table>

**Defaults**

If the capture point name is not provided, the command displays all the capture point details.  
If the display mode is not specified, the command defaults to brief mode.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOS XE 3.3.0SG/ 15.1(1)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

When the command is issued with no parameters, it displays the details of all the capture points. When specified with a capture point name and no other parameters, it displays the details of the specific capture point name. With the `parameter` keyword, the command reconstructs the commands that describe the capture point and displays them.

The `buffer` option displays the packets from the capture buffer. This option is applicable only if the capture point directs the captured packets to the buffer. The packets can be decoded and displayed in either the brief, detailed, or dump mode. The default mode is `brief`.

**Examples**

Following are examples of how to use the `show monitor capture` command:

```
Switch# show monitor capture mycap buffer brief
0.000000 10.1.1.215 -> 20.1.1.2  UDP Source port: 20001 Destination port: 20002
1.000000 10.1.1.216 -> 20.1.1.2  UDP Source port: 20001 Destination port: 20002
2.000000 10.1.1.217 -> 20.1.1.2  UDP Source port: 20001 Destination port: 20002
3.000000 10.1.1.218 -> 20.1.1.2  UDP Source port: 20001 Destination port: 20002
4.000000 10.1.1.219 -> 20.1.1.2  UDP Source port: 20001 Destination port: 20002
5.000000 10.1.1.220 -> 20.1.1.2  UDP Source port: 20001 Destination port: 2002
6.000000 10.1.1.221 -> 20.1.1.2  UDP Source port: 20001 Destination port: 2002
7.000000 10.1.1.222 -> 20.1.1.2  UDP Source port: 20001 Destination port: 2002
8.000000 10.1.1.223 -> 20.1.1.2  UDP Source port: 20001 Destination port: 2002
11.000000 10.1.1.226 -> 20.1.1.2 UDP Source port: 20001 Destination port: 2002
```
### show monitor capture

<table>
<thead>
<tr>
<th>Time (sec)</th>
<th>Source IP</th>
<th>Destination IP</th>
<th>Source Port</th>
<th>Destination Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.000000</td>
<td>10.1.1.227</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>13.000000</td>
<td>10.1.1.228</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>14.000000</td>
<td>10.1.1.229</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>15.000000</td>
<td>10.1.1.230</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>16.000000</td>
<td>10.1.1.231</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>17.000000</td>
<td>10.1.1.232</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>18.000000</td>
<td>10.1.1.233</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>19.000000</td>
<td>10.1.1.234</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>20.000000</td>
<td>10.1.1.235</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
<tr>
<td>21.000000</td>
<td>10.1.1.236</td>
<td>20.1.1.2</td>
<td>20001</td>
<td>2002</td>
</tr>
</tbody>
</table>

```
Switch# show monitor capture mycap buffer detailed
Frame 1: 256 bytes on wire (2048 bits), 256 bytes captured (2048 bits)
Arrival Time: Apr 15, 2012 15:50:02.398966000 PDT
Epoch Time: 1334530202.398966000 seconds
[Time delta from previous captured frame: 0.000000000 seconds]
[Time delta from previous displayed frame: 0.000000000 seconds]
[Time since reference or first frame: 0.000000000 seconds]
Frame Number: 1
Frame Length: 256 bytes (2048 bits)
[Frame is marked: False]
[Frame is ignored: False]
```

```
Ethernet II, Src: 00:00:00:00:03:01 (00:00:00:00:03:01), Dst: 54:75:d0:3a:85:3f (54:75:d0:3a:85:3f)
otime: 15:50:02.398966000, Time delta: 0.000000000
```

```
Source: 00:00:00:00:03:01 (00:00:00:00:03:01)
Address: 00:00:00:00:03:01 (00:00:00:00:03:01)
```

```
Switch# show monitor capture mycap buffer dump
```

```
0.000000  10.1.1.215 -> 20.1.1.2  UDP Source port: 20001 Destination port: 20002
```

```
00 54 75 d0 3a 85 3f 00 00 00 00 03 01 08 00 45 00 Tu...?........E.
0010 00 ee 00 00 00 00 40 11 59 25 0a 01 01 d7 14 01 ........@.Y%.....
0020 01 02 4e 21 4e 22 00 da 6d e0 00 01 02 03 04 05 ..N!N"..m......
0030 06 07 08 09 0a 0b 0c 0d 0e 0f 10 11 12 13 14 15 ..................
0040 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22 23 24 25 .............. !"#$%
0050 26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 32 33 34 35 &()++-./012345
0060 36 37 38 39 3a 3b 3c 3d 3e 3f 40 41 42 43 44 45 6789:;<=>?@
0070 46 47 48 49 4a 4b 4c 4d 4e 4f 50 51 52 53 54 55 FGHIJKLMNOPQRSTU
0080 56 57 58 59 5a 5b 5c 5d 5e 5f 60 61 62 63 64 65 VWXYZ{]|"`abcde
0090 66 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 73 74 75 fghijklnopqrstuvwxyz
00a0 76 77 78 79 7a 7b 7c 7d 7e 7f 80 81 82 83 84 85 vwxyz{|}-
00b0 86 87 88 89 8a 8b 8c 8d 8e 8f 90 91 92 93 94 95
00c0 96 97 98 99 9a 9b 9c 9d 9e 9f a0 a1 a2 a3 a4 a5
00d0 a6 a7 a8 a9 aa ab ac ad ae af b0 b1 b2 b3 b4 b5
00e0 b6 b7 b8 b9 ba bb bc bd be bf c0 c1 c2 c3 c4 c5
00f0 c6 c7 c8 c9 ca cb cc cd ce cf d0 d1 03 3e d0 33 ..........................>.

OL-27596-01

Catalyst 4500 Series Switch Cisco IOS Command Reference—Release IOS XE 3.4.0SG and IOS 15.1(2)SG)
show monitor capture file

To decode and display packets from a previously captured .pcap file, use the `show monitor capture file` command.

```
show monitor capture file name [display-filter filter-string] [brief | detailed | dump]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Specifies the filename.</td>
</tr>
<tr>
<td>display-filter</td>
<td>Specifies the display filter string according to Wireshark’s display-filter syntax.</td>
</tr>
<tr>
<td>brief</td>
<td>detailed</td>
</tr>
</tbody>
</table>

- **brief**: Displays a one line summary of the packet with key fields
- **detailed**: Displays all the fields in the packet for the protocols supported and displays the payload in hexadecimal form.
- **dump**: Displays a one line summary of the packet with key fields and also displays the packet in hexadecimal form.

### Defaults

`brief`

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOS XE 3.3.0SG/15.1(1)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

If no display filter is specified, then all the packets in the file are displayed. Because the display filter must observe the Wireshark display filter syntax, ensure that the display filter is accurate. Also, use a double quotes when specifying the filter.

### Examples

This example shows how to display packets from a .pcap file with a display filter:

```
Switch# show monitor capture file bootflash:test.pcap display-filter
```

This example displays a brief output from a .pcap file:

```
Switch# show monitor capture file bootflash:mycap.pcap
1 0.000000 10.1.1.140 -> 20.1.1.2 UDP Source port: 20001 Destination port: 20002
2 1.000000 10.1.1.141 -> 20.1.1.2 UDP Source port: 20001 Destination port: 20002
3 2.000000 10.1.1.142 -> 20.1.1.2 UDP Source port: 20001 Destination port: 20002
```
show monitor capture file

<table>
<thead>
<tr>
<th></th>
<th>Timestamp</th>
<th>Source IP</th>
<th>Source Port</th>
<th>Destination IP</th>
<th>Destination Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3.000000</td>
<td>10.1.1.143</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4.000000</td>
<td>10.1.1.144</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5.000000</td>
<td>10.1.1.145</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>6.000000</td>
<td>10.1.1.146</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>7.000000</td>
<td>10.1.1.147</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>8.000000</td>
<td>10.1.1.148</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>9.000000</td>
<td>10.1.1.149</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
<tr>
<td>11</td>
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<tr>
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<tr>
<td>20</td>
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<td>34</td>
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<tr>
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<td>35.000000</td>
<td>10.1.1.175</td>
<td>20001</td>
<td>20.1.1.2</td>
<td></td>
</tr>
</tbody>
</table>
This example shows how to display a detailed output from a .pcap file:

```
Switch# show monitor capture file bootflash:mycap.pcap detailed
Frame 1: 256 bytes on wire (2048 bits), 256 bytes captured (2048 bits)
Arrival Time: Mar 21, 2012 14:35:09.111993000 PDT
Epoch Time: 1332365709.111993000 seconds
[Time delta from previous captured frame: 0.000000000 seconds]  
[Time delta from previous displayed frame: 0.000000000 seconds]  
[Time since reference or first frame: 0.000000000 seconds]  
Frame Number: 1
Frame Length: 256 bytes (2048 bits)
Capture Length: 256 bytes (2048 bits)
[Frame is marked: False]  
[Frame is ignored: False]
```
show monitor capture file


Ethernet II, Src: 00:00:00:00:03:01 (00:00:00:00:03:01), Dst: 54:75:03:85:3f (54:75:03:85:3f)
Destination: 54:75:03:85:3f (54:75:03:85:3f)  
Address: 54:75:03:85:3f (54:75:03:85:3f)
.... .... .... .... = IG bit: Individual address (unicast)
.... .0. .... .... .... = LG bit: Globally unique address (factory default)
Source: 00:00:00:00:03:01 (00:00:00:00:03:01)  
Address: 00:00:00:00:03:01 (00:00:00:00:03:01)
.... .... .... .... = IG bit: Individual address (unicast)
.... .0. .... .... .... = LG bit: Globally unique address (factory default)

Type: IP (0x0800)
Frame check sequence: 0x03b07f42 [incorrect, should be 0x08fcee78]

Internet Protocol, Src: 10.1.1.140 (10.1.1.140), Dst: 20.1.1.2 (20.1.1.2)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (0x00)
0000  00.. = Differentiated Services Codepoint: Default (0x00)
.... .0. = ECN-Capable Transport (ECT): 0
.... .... = ECN-CE: 0
Total Length: 238
Identification: 0x0000 (0)
Flags: 0x00
 0... .... = Reserved bit: Not set
 .0. .... = Don't fragment: Not set
 ..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 64
Protocol: UDP (17)
Header checksum: 0x5970 [correct]

Source: 10.1.1.140 (10.1.1.140)
Destination: 20.1.1.2 (20.1.1.2)
User Datagram Protocol, Src Port: 20001 (20001), Dst Port: 20002 (20002)
Source port: 20001 (20001)
Destination port: 20002 (20002)
Length: 218
Checksum: 0x6e2b [validation disabled]

User Datagram Protocol, Src Port: 20001 (20001), Dst Port: 20002 (20002)
Source port: 20001 (20001)
Destination port: 20002 (20002)
Length: 218
Checksum: 0x6e2b [validation disabled]

Data (210 bytes)

0000 00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f .................  
0010 10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f .................  
0020 20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f !"#$%&'()*+,-./  
0030 30 31 32 33 34 35 36 37 38 39 3a 3b 3c 3d 3e 3f 0123456789:;<=>?
0040 40 41 42 43 44 45 46 47 48 49 4a 4b 4c 4d 4e 4f ABCDEFGHIJKLMNOPQRSTU.VWXYZ[\]^_  
0050 50 51 52 53 54 55 56 57 58 59 5a 5b 5c 5d 5e 5f ABCDEFGHIJKLMNOPQRSTU.VWXYZ[\]^_  
0060 60 61 62 63 64 65 66 67 68 69 6a 6b 6c 6d 6e 6f abcdefghijklmnopqrstuvwxyz{\}_  
0070 70 71 72 73 74 75 76 77 78 79 7a 7b 7c 7d 7e 7f 0123456789:;<=>?
0080 80 81 82 83 84 85 86 87 88 89 8a 8b 8c 8d 8e 8f pqrstuvwxyz|  
0090 90 91 92 93 94 95 96 97 98 99 9a 9b 9c 9d 9e 9f 0123456789:;<=>?
00a0 a0 a1 a2 a3 a4 a5 a6 a7 a8 a9 aa ab ac ad ae af  
00b0 b0 b1 b2 b3 b4 b5 b6 b7 b8 b9 ba bb bc bd be bf  
00c0 c0 c1 c2 c3 c4 c5 c6 c7 c8 c9 ca cb cc cd ce cf  
00d0 d0 d1 ...  

Data: 000102030405060708090a0b0c0d0e0f1011121314151617...  
[Length: 210]

Frame 2: 256 bytes on wire (2048 bits), 256 bytes captured (2048 bits)
Arrival Time: Mar 21, 2012 14:35:10.111993000 PDT
show netflow-lite exporter

Note

NetFlow-lite is only supported on the Catalyst 4948E and Catalyst 4948E-F Ethernet switches.

To display information about the collector and global stats, use the `show netflow-lite exporter` command.

```
show netflow-lite exporter exporter-name
```

Syntax Description

- `exporter-name` Specifies an exporter name.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

- **Release** 15.0(2)SG Command introduced on the Catalyst 4500 series switch.

Usage Guidelines

This command displays the total number of export packets sent.

Examples

This example shows how to display information about the collector and global stats:

```
Switch# show netflow-lite exporter e1
Netflow-lite Exporter e1:
    Description:          Exporter
    Network Protocol Configuration:
        Destination IP address: 192.168.1.1
        VRF label:            cisc
        Source IP Address:    10.1.1.5
        DSCP:                0x1
        TTL:                 30
        COS:                 1
    Transport Protocol Configuration:
        Transport Protocol:  UDP
        Destination Port:   1234
        Source Port:        65535
    Export Protocol Configuration:
        Export Protocol:      netflow-v9
    Exporter Statistics:
        Export packets sent: 36
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cos (netflow-lite exporter submode)</code></td>
<td>Specifies a cos value for the NetFlow-lite collector.</td>
</tr>
<tr>
<td><code>source (netflow-lite exporter submode)</code></td>
<td>Specifies a source Layer 3 interface of the NetFlow-lite collector.</td>
</tr>
<tr>
<td><code>transport udp (netflow-lite exporter submode)</code></td>
<td>Specifies a UDP transport destination port for a NetFlow-lite collector.</td>
</tr>
<tr>
<td><code>ttl (netflow-lite exporter submode)</code></td>
<td>Specifies a ttl value for the NetFlow-lite collector.</td>
</tr>
<tr>
<td><code>dscp (netflow-lite exporter submode)</code></td>
<td>Specifies a cos value for the NetFlow-lite collector.</td>
</tr>
<tr>
<td><code>template data timeout (netflow-lite exporter submode)</code></td>
<td>Specifies a template data timeout for the NetFlow-lite collector.</td>
</tr>
<tr>
<td><code>options timeout (netflow-lite exporter submode)</code></td>
<td>Specifies an options timeout for the NetFlow-lite collector.</td>
</tr>
<tr>
<td><code>export-protocol (netflow-lite exporter submode)</code></td>
<td>Specifies the export protocol for the NetFlow-lite collector.</td>
</tr>
</tbody>
</table>
show netflow-lite monitor

Note: NetFlow-lite is only supported on the Catalyst 4948E and Catalyst 4948E-F Ethernet switches.

To display information about a particular packet or per data source stats, use the `show netflow-lite monitor` command.

```
show netflow-lite monitor monitor-number interface interface-name
show netflow-lite monitor monitor-number vlan vlan-id
```

**Syntax Description**

- `monitor-number`: Specifies a monitor name.
- `interface-name`: Specifies an interface.
- `vlan-id`: Specifies a VLAN.

**Defaults**

None

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.0(2)SG</td>
<td>Command introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command displays information about a particular packet or per data source stats. The interface can be either a physical port or a VLAN.

This command displays the following packet sampling statistics:

- Total # of packet (samples) exported
- Total # of packet (samples) dropped due to lack of local resources
- Total # of packets seen at the data source

The `packetsObserved` statistic accounts for packets that are dropped by input ACL or QoS policer.

The exported packets only represent samples from the non-dropped packet population.

**Examples**

These examples show how to display information about a particular packet or per data source stats:

```
Switch# show netflow-lite monitor 1 interface gi1/3
Interface GigabitEthernet1/3:
  Netflow-lite Monitor-1:
    Active: TRUE
    Sampler: sampler1
    Exporter: exporter1
    Average Packet Size: 0
```
Statistics:
Packets exported: 0
Packets observed: 0
Packets dropped: 0
Average Packet Size observed: 64
Average Packet Size used: 64

Switch# show netflow-lite monitor 1 vlan 2
VlanID-2:
  Netflow-lite Monitor-1:
    Active:               TRUE
    Sampler:              sampler1
    Exporter:             exporter1
    Average Packet Size:  0
  Statistics:
    Packets exported: 0
    Packets observed: 0
    Packets dropped: 0
    Average Packet Size observed: 64
    Average Packet Size used: 64

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sampler (netflow-lite monitor submode)</td>
<td>Activates sampling on an interface in netflow-lite monitor submode.</td>
</tr>
<tr>
<td>exporter (netflow-lite monitor submode)</td>
<td>Assigns an exporter in netflow-lite monitor submode.</td>
</tr>
<tr>
<td>average-packet-size</td>
<td>Specifies the average packet size at the observation point.</td>
</tr>
<tr>
<td>(netflow-lite monitor submode)</td>
<td></td>
</tr>
</tbody>
</table>
show netflow-lite sampler

Note
NetFlow-lite is only supported on the Catalyst 4948E and Catalyst 4948E-F Ethernet switches.

To display information about a sampler, use the show netflow-lite sampler command.

```
show netflow-lite sampler sampler-name
```

Syntax Description

```
sampler-name
```
Specifies a sampler name.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

```
Release  Modification
15.0(2)SG  Command introduced on the Catalyst 4500 series switch.
```

Examples

This example shows how to display information about a sampler:

```
Switch# show netflow-lite sampler low-rate
Netflow-lite Sampler low-rate:
  Description:          Sampler
  Sampling rate:        1 out of 256
  Packet Section Size:  64 bytes
  Packet offset:        0 bytes
```

Related Commands

```
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>packet-section size (netflow-lite sampler submode)</td>
<td>Specifies a sampled header size in netflow-lite submode.</td>
</tr>
<tr>
<td>packet-rate (netflow-lite sampler submode)</td>
<td>Specifies a packet sampling rate in netflow-lite sampler submode.</td>
</tr>
<tr>
<td>packet-offset (netflow-lite sampler submode)</td>
<td>Specifies a starting packet offset in netflow-lite submode.</td>
</tr>
</tbody>
</table>
```
show nmsp

To display the Network Mobility Services Protocol (NMSP) information for the switch, use the `show nmsp` command. This command is available only when your switch is running the cryptographic (encrypted) software image.

```
show nmsp [attachment suppress interface | capability | notification interval | statistics |
  {connection | summary} | status | subscription {detail | summary}]
```

**Syntax Description**

- **attachment suppress interface**
  Displays attachment suppress interfaces.

- **capability**
  Displays switch capabilities including the supported services and subservices.

- **notification interval**
  Displays the notification intervals of the supported services.

- **statistics connection | summary**
  Displays the NMSP statistics information.
  - **connection**—Displays the message counters on each connection.
  - **summary**—Displays the global counters.

- **status**
  Displays information about the NMSP connections.

- **subscription detail | summary**
  Displays the subscription information on each NMSP connection.
  - **detail**—Displays all services and subservices subscribed on each connection.
  - **summary**—Displays all services subscribed on each connection.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(52)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of output from the `show nmsp attachment suppress interface` command:

```
Switch# show nmsp attachment suppress interface
NMSP Attachment Suppression Interfaces
--------------------------------------
GigabitEthernet1/1
GigabitEthernet1/2
Switch#
```
This is an example of output from the `show nmsp capability` command:

```bash
Switch# show nmsp capability
NMSP Switch Capability
--------------------------
Service     Subservice
------------     ----------
Attachment     Wired Station
Location       Subscription
Switch#
```

This is an example of output from the `show nmsp notification interval` command:

```bash
Switch# show nmsp notification interval
NMSP Notification Intervals
--------------------------
Attachment notify interval: 30 sec (default)
Location notify interval: 30 sec (default)
Switch#
```

This is an example of output from the `show nmsp statistics connection` and `show nmsp statistics summary` commands:

```bash
Switch# show nmsp statistics connection
NMSP Connection Counters
--------------------------
Connection 1:  
  Connection status: UP
  Freed connection: 0
  Tx message count
    Subscr Resp: 1  Subscr Req: 1
    Capa Notif: 1  Capa Notif: 1
    Atta Resp: 1  Atta Req: 1
    Atta Notif: 0
    Loc Resp: 1  Loc Req: 1
    Loc Notif: 0
  Unsupported msg: 0
Switch#
```

```bash
Switch# show nmsp statistics summary
NMSP Global Counters
--------------------------
  Send too big msg: 0
  Failed socket write: 0
  Partial socket write: 0
  Socket write would block: 0
  Partial socket write: 0
  Failed socket read: 0
  Socket read would block: 0
  Transmit Q full: 0
  Max Location Notify Msg: 0
  Max Attachment Notify Msg: 0
  Max TX Q Size: 0
Switch#
```
This is an example of output from the **show nmsp status** command:

```
Switch# show nmsp status
NMSP Status
---------------
NMSP: enabled

MSE IP Address  TxEchoResp  RxEchoReq  TxData  RxData
---------------  ----------  ---------  ------  -----
172.19.35.109     5          5         4       4
Switch#
```

This is an example of output from the **show nmsp show subscription detail** and **show nmsp show subscription summary** commands:

```
Switch# show nmsp subscription detail
Mobility Services Subscribed by 172.19.35.109:
Services    Subservices
------------  -------------------
Attachment:  Wired Station
Location:    Subscription

Switch# show nmsp subscription summary
Mobility Services Subscribed:
MSE IP Address  Services
---------------  ------
172.19.35.109    Attachment, Location
Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear nmsp statistics</td>
<td>Clears the NMSP statistic counters.</td>
</tr>
<tr>
<td>nmsp</td>
<td>Configures Network Mobility Services Protocol (NMSP) on the switch.</td>
</tr>
</tbody>
</table>
show pagp

To display information about the port channel, use the show pagp command.

```
show pagp [group-number] {counters | dual-active | internal | neighbor}
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>group-number</td>
<td>(Optional) Channel-group number; valid values are from 1 to 64.</td>
</tr>
<tr>
<td>counters</td>
<td>Specifies the traffic counter information.</td>
</tr>
<tr>
<td>dual-active</td>
<td>Specifies the dual-active information.</td>
</tr>
<tr>
<td>internal</td>
<td>Specifies the PAgP internal information.</td>
</tr>
<tr>
<td>neighbor</td>
<td>Specifies the PAgP neighbor information.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

You can enter any `show pagp` command to display the active PAgP port-channel information. To display the nonactive information, enter the `show pagp` command with a group.

### Examples

This example shows how to display information about the PAgP counter:

```
Switch# show pagp counters

Information                  Flush
Port  Sent  Recv  Sent  Recv
---------------------------------------------
Channel group: 1
Fa5/4  2660  2452  0  0
Fa5/5  2676  2453  0  0
Channel group: 2
Fa5/6  289  261  0  0
Fa5/7  290  261  0  0
Switch#
```

This example shows how to display PAgP dual-active information:

```
Switch# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
```
Channel group 30
Dual-Active Partner Partner Partner
Port Detect Capable Name Port Version
Te3/1 Yes VS1-Reg2 Te1/1/7 1.1
Te4/1 Yes VS1-Reg2 Te2/2/8 1.1

Channel group 32
Dual-Active Partner Partner Partner
Port Detect Capable Name Port Version
Gi1/43 Yes VS3 Gi1/1/43 1.1
Gi1/44 Yes VS3 Gi1/1/44 1.1
Gi1/45 Yes VS3 Gi1/1/45 1.1
Gi1/46 Yes VS3 Gi2/1/46 1.1
Gi1/47 Yes VS3 Gi2/1/47 1.1
Gi1/48 Yes VS3 Gi2/1/48 1.1
Gi2/3 Yes VS3 Gi1/1/1 1.1
Gi2/4 Yes VS3 Gi1/1/1 1.1

Switch#

This example shows how to display internal PAgP information:

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>IfIndx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa5/4</td>
<td>SC</td>
<td>U6/S7</td>
<td>30s</td>
<td>1</td>
<td>128</td>
<td>Any</td>
<td>129</td>
<td></td>
</tr>
<tr>
<td>Fa5/5</td>
<td>SC</td>
<td>U6/S7</td>
<td>30s</td>
<td>1</td>
<td>128</td>
<td>Any</td>
<td>129</td>
<td></td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display PAgP neighbor information for all neighbors:

Switch# show pagp 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>Name</th>
<th>Device ID</th>
<th>Age</th>
<th>Flags</th>
<th>Cap.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa5/4</td>
<td>JAB031301</td>
<td>0050.0f10.230c</td>
<td>2/45</td>
<td>2s</td>
<td>SAC</td>
</tr>
<tr>
<td>Fa5/5</td>
<td>JAB031301</td>
<td>0050.0f10.230c</td>
<td>2/46</td>
<td>27s</td>
<td>SAC</td>
</tr>
</tbody>
</table>

Channel group 2 neighbors

<table>
<thead>
<tr>
<th>Port</th>
<th>Name</th>
<th>Device ID</th>
<th>Age</th>
<th>Flags</th>
<th>Cap.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fa5/6</td>
<td>JAB031301</td>
<td>0050.0f10.230c</td>
<td>2/47</td>
<td>10s</td>
<td>SAC</td>
</tr>
<tr>
<td>Fa5/7</td>
<td>JAB031301</td>
<td>0050.0f10.230c</td>
<td>2/48</td>
<td>11s</td>
<td>SAC</td>
</tr>
</tbody>
</table>

Switch#

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pagp learn-method</td>
<td>Learns the input interface of the incoming packets.</td>
</tr>
<tr>
<td>pagp port-priority</td>
<td>Selects a port in hot standby mode.</td>
</tr>
</tbody>
</table>

Catalyst 4500 Series Switch Cisco IOS Command Reference—Release IOS XE 3.4.0(SG) and IOS 15.1(2)(SG)
show pagp dual-active (virtual switch)

To display dual-active detection information, use the `show pagp dual-active` command in EXEC mode.

```
show pagp [group-number] dual-active
```

**Syntax Description**

`group-number` (Optional) Channel-group number. Range: 1 to 256 with a maximum of 64 values.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS XE 3.4.0SG and</td>
<td>Support for this command was introduced on the Catalyst 4500 series</td>
</tr>
<tr>
<td>15.1(2)SG</td>
<td>switch.</td>
</tr>
</tbody>
</table>

**Examples**

The following example shows how to display dual-active detection information:

```
Router# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
Channel group 1
Dual-Active trusted group: Yes
Channel group 2
Dual-Active trusted group: Yes
Channel group 3 dual-active detect capability w/nbhrs
Dual-Active trusted group: No

Dual-Active   Partner   Partner   Partner
Port          Detect Capable Name       Port      Version
Fa1/2/33      No              None                 None      N/A

Router#
```

The following example shows how to display dual-active detection information for a specific port channel:

```
Router# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
Channel group 3 dual-active detect capability w/nbhrs Dual-Active trusted group: No

Dual-Active   Partner   Partner   Partner
Port          Detect Capable Name       Port      Version
Fa1/2/33      No              None                 None      N/A

Channel group 4
Dual-Active trusted group: Yes
No interfaces configured in the channel group
Channel group 5
Dual-Active trusted group: Yes
Channel group 10 dual-active detect capability w/nbhrs Dual-Active trusted group: Yes

Dual-Active   Partner   Partner   Partner
Port          Detect Capable Name       Port      Version
```

The following example shows how to display dual-active detection information for a specific port channel:

Router# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
Channel group 3 dual-active detect capability w/nbrs
Dual-Active trusted group: No

Port      Dual-Active  Partner  Partner  Partner
Detect Capable Name                  Port      Version
Fa1/2/13   Yes          mr-rogers-nbr  Fa1/2/13  1.1
Fa1/2/14   Yes          mr-rogers-nbr  Fa1/2/14  1.1
Gi2/1/15   Yes          mr-rogers-nbr  Fa1/2/15  1.1
Gi2/1/16   Yes          mr-rogers-nbr  Fa1/2/16  1.1
Router#

Related Commands  Command  Description
------------------  -------  ----------------------------
**dual-active detection (virtual switch)**  Enables and configures dual-active detection.
show policy-map

To display information about the policy map, use the show policy-map command.

```
show policy-map [policy_map_name]
```

**Syntax Description**

- `policy_map_name`: (Optional) Name of the policy map.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display information for all the policy maps:

```
Switch# show policy-map
Policy Map ipp5-policy
 class ipp5
 set ip precedence 6
Switch#
```

This example shows how to display information for a specific policy map:

```
Switch# show policy ipp5-policy
Policy Map ipp5-policy
 class ipp5
 set ip precedence 6
Switch#
```

**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 and to enter class-map configuration mode</td>
</tr>
<tr>
<td>policy-map</td>
<td>Creates a policy map that can be attached to multiple ports to specify a service policy and to enter policy-map configuration mode</td>
</tr>
<tr>
<td>show class-map</td>
<td>Displays class map information.</td>
</tr>
<tr>
<td>show policy-map</td>
<td>Displays the statistics and configurations of the input and output policies that are attached to an interface.</td>
</tr>
</tbody>
</table>
**show policy-map control-plane**

To display the configuration either of a class or of all classes for the policy map of a control plane, use the `show policy-map control-plane` command.

```
show policy-map control-plane [input [class class-name] | [class class-name]]
```

**Syntax Description**

- `input` (Optional) Displays statistics for the attached input policy.
- `class class-name` (Optional) Displays the name of the class.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command is not supported on the Supervisor Engine 6-E and Catalyst 4900M chassis.

The `show policy-map control-plane` command displays information for aggregate control-plane services that control the number or rate of packets that are going to the process level.

**Examples**

This example shows that the policy map TEST is associated with the control plane. This policy map polices traffic that matches the class-map TEST, while allowing all other traffic (that matches the class-map class-default) to go through as is. Table 2-39 describes the fields shown in the display.

Switch# show policy-map control-plane

```
Control Plane

Service-policy input: system-cpp-policy

Class-map: system-cpp-eapol (match-all)
  0 packets
  Match: access-group name system-cpp-eapol

Class-map: system-cpp-bpdu-range (match-all)
  0 packets
  Match: access-group name system-cpp-bpdu-range

Class-map: system-cpp-cdp (match-all)
  28 packets
  Match: access-group name system-cpp-cdp
  police: Per-interface
    Conform: 530 bytes Exceed: 0 bytes
```
show policy-map control-plane

Class-map: system-cpp-garp (match-all)
  0 packets
  Match: access-group name system-cpp-garp

Class-map: system-cpp-sstp (match-all)
  0 packets
  Match: access-group name system-cpp-sstp

Class-map: system-cpp-cgmp (match-all)
  0 packets
  Match: access-group name system-cpp-cgmp

Class-map: system-cpp-ospf (match-all)
  0 packets
  Match: access-group name system-cpp-ospf

Class-map: system-cpp-igmp (match-all)
  0 packets
  Match: access-group name system-cpp-igmp

Class-map: system-cpp-pim (match-all)
  0 packets
  Match: access-group name system-cpp-pim

Class-map: system-cpp-all-systems-on-subnet (match-all)
  0 packets
  Match: access-group name system-cpp-all-systems-on-subnet

Class-map: system-cpp-all-routers-on-subnet (match-all)
  0 packets
  Match: access-group name system-cpp-all-routers-on-subnet

Class-map: system-cpp-ripv2 (match-all)
  0 packets
  Match: access-group name system-cpp-ripv2

Class-map: system-cpp-ip-mcast-linklocal (match-all)
  0 packets
  Match: access-group name system-cpp-ip-mcast-linklocal

Class-map: system-cpp-dhcp-cs (match-all)
  0 packets
  Match: access-group name system-cpp-dhcp-cs

Class-map: system-cpp-dhcp-sc (match-all)
  0 packets
  Match: access-group name system-cpp-dhcp-sc

Class-map: system-cpp-dhcp-ss (match-all)
  0 packets
  Match: access-group name system-cpp-dhcp-ss

Class-map: class-default (match-any)
  0 packets
  Match: any
  0 packets

Switch#
## Chapter 2 Cisco IOS Commands for the Catalyst 4500 Series Switches

### show policy-map control-plane

#### Table 2-39 show policy-map control-plane Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fields Associated with Classes or Service Policies</strong></td>
<td></td>
</tr>
<tr>
<td>Service-policy input</td>
<td>Name of the input service policy that is applied to the control plane. (If configured, this field will also show the output service policy.)</td>
</tr>
<tr>
<td>Class-map</td>
<td>Class of traffic being displayed. Traffic is displayed for each configured class. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class.</td>
</tr>
<tr>
<td>Match</td>
<td>Match criteria for the specified class of traffic.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>For more information about the variety of match criteria options available, refer to the chapter “Configuring the Modular Quality of Service Command-Line Interface” in the Cisco IOS Quality of Service Solutions Configuration Guide.</td>
</tr>
<tr>
<td><strong>Fields Associated with Traffic Policing</strong></td>
<td></td>
</tr>
<tr>
<td>police</td>
<td>The <code>police</code> command has been configured to enable traffic policing.</td>
</tr>
<tr>
<td>conformed</td>
<td>Action to be taken on packets conforming to a specified rate; displays the number of packets and bytes on which the action was taken.</td>
</tr>
<tr>
<td>exceeded</td>
<td>Action to be taken on packets exceeding a specified rate; displays the number of packets and bytes on which the action was taken.</td>
</tr>
</tbody>
</table>

#### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>control-plane</td>
<td>Enters control-plane configuration mode.</td>
</tr>
<tr>
<td>service-policy input (control-plane)</td>
<td>Attaches a policy map to a control plane for aggregate control plane services.</td>
</tr>
</tbody>
</table>
show policy-map interface

To display the statistics and configurations of the input and output policies that are attached to an interface, use the `show policy-map interface` command.

```
show policy-map interface [{fastethernet interface-number} | {gigabitethernet interface-number} | {port-channel number} | {vlan vlan_id}] [input | output]
```

**Syntax Description**

- **fastethernet interface-number** (Optional) Specifies the Fast Ethernet 802.3 interface.
- **gigabitethernet interface-number** (Optional) Specifies the Gigabit Ethernet 802.3z interface.
- **port-channel number** (Optional) Specifies the port channel.
- **vlan vlan_id** (Optional) Specifies the VLAN ID; valid values are from 1 to 4094.
- **input** (Optional) Specifies input policies only.
- **output** (Optional) Specifies output policies only.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
<tr>
<td>12.2(25)SG</td>
<td>Displays results for full flow policing.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the statistics and configurations of all input and output policies attached to an interface:

```
Switch# show policy-map interface

FastEthernet6/1

service-policy input:ipp5-policy

   class-map:ipp5 (match-all)
      0 packets
      match:ip precedence 5
      set:
         ip precedence 6

   class-map:class-default (match-any)
      0 packets
      match:ip precedence 5
      set:
         ip precedence 6

```
Chapter 2  Cisco IOS Commands for the Catalyst 4500 Series Switches

This example shows how to display the input policy statistics and configurations for a specific interface:

Switch# show policy-map interface fastethernet 5/36 input

This example shows how to display the input policy statistics and configurations for a specific interface:

With the following configuration, each flow is policed to a 1000000 bps with an allowed 9000-byte burst value.

If you use the `match flow ip source-address|destination-address` command, these two flows are consolidated into one flow and they have the same source and destination address.

Switch# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# class-map c1
Switch(config-cmap)# match flow ip source-address ip destination-address ip protocol l4 source-port l4 destination-port
Switch(config-cmap)# exit
Switch(config)# policy-map p1
Switch(config-pmap)# class c1
Switch(config-pmap-c)# police 1000000 9000
Switch(config-pmap-c)# exit
Switch(config)# interface fastEthernet 6/1
Switch(config-if)# service-policy input p1
Switch(config-if)# end
Switch# write memory
Switch# show policy-map interface

class-map c1
  match flow ip source-address ip destination-address ip protocol l4 source-port l4 destination-port
! policy-map p1
  class c1
show policy-map interface

police 1000000 bps 9000 byte conform-action transmit exceed-action drop
!
interface FastEthernet 6/1
service-policy input pl

Switch# show policy-map pl
Policy Map pl
Class c1
  police 1000000 bps 9000 byte conform-action transmit exceed-action drop

Switch# show policy-map interface
FastEthernet6/1

  Service-policy input: pl

  Class-map: c1 (match-all)
    15432182 packets
    Match: flow ip source-address ip destination-address ip protocol l4 source-port l4 destination-port
    police: Per-interface
    Conform: 64995654 bytes Exceed: 2376965424 bytes

  Class-map: class-default (match-any)
    0 packets
    Match: any
    0 packets

Switch#

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>class-map</td>
<td>Creates a class map to be used for matching packets to the class whose name you specify and to be used enter class-map configuration mode.</td>
</tr>
<tr>
<td></td>
<td>policy-map</td>
<td>Creates a policy map that can be attached to multiple ports to specify a service policy and to enter policy-map configuration mode.</td>
</tr>
<tr>
<td></td>
<td>show class-map</td>
<td>Displays class map information.</td>
</tr>
<tr>
<td></td>
<td>show qos</td>
<td>Displays QoS information.</td>
</tr>
</tbody>
</table>
show policy-map interface vlan

To show the QoS policy-map information applied to a specific VLAN on an interface, use the `show policy-map interface vlan` command.

```
show policy-map interface vlan interface-id vlan vlan-id
```

**Syntax Description**

- `interface interface-id` (Optional) Displays QoS policy-map information for a specific interface.
- `vlan vlan-id` (Optional) Displays QoS policy-map information for a specific VLAN.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

The following example show a configuration on a non-Supervisor Engine 6-E:

```
interface GigabitEthernet3/1
  vlan-range 20,400
  service-policy input p1
  vlan-range 300-301
  service-policy output p2
```

This example shows how to display policy-map statistics on VLAN 20 on the Gigabit Ethernet 6/1 interface:

```
Switch# show policy-map interface gigabitEthernet 3/1 vlan 20
GigabitEthernet3/1 vlan 20
Service-policy input: p1
  Class-map: class-default (match-any)
    0 packets
  Match: any
    0 packets
  police: Per-interface
    Conform: 0 bytes Exceed: 0 bytes
```

The following example shows a configuration on a non-Supervisor Engine 6-E:

```
interface fastethernet6/1
  vlan-range 100
  service-policy in p1
```

This example shows how to display policy-map statistics on VLAN 100 on the FastEthernet interface:

```
Switch# show policy-map interface fastEthernet 6/1 vlan 100
FastEthernet6/1 vlan 100
Service-policy input: p1
```
Class-map: c1 (match-all)
  0 packets
  Match: ip dscp af11 (10)
  police: Per-interface
    Conform: 0 bytes Exceed: 0 bytes

Class-map: class-default (match-any)
  0 packets
  Match: any

Switch#

The following example shows a configuration on a Supervisor Engine 6-E:

interface gigabitethernet3/1
  vlan-range 100
  service-policy in p1

This example shows how to display policy-map statistics on VLAN 100 on the FastEthernet interface:

Switch# show policy-map interface gigabitethernet 3/1 vlan 100
GigabitEthernet3/1 vlan 100
  Service-policy input: p1

  Class-map: c1 (match-all)
    0 packets
    Match: ip dscp af11 (10)
    police:
      rate 128000 bps, burst 4000 bytes
      conformed 0 packets, 0 bytes; action: transmit
      exceeded 0 packets, 0 bytes; action: drop
    conformed 0 bps, exceeded 0 bps

  Class-map: class-default (match-any)
    0 packets
    Match: any

Switch#

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>service-policy (interface configuration)</strong></td>
<td>Attaches a policy map to an interface.</td>
</tr>
<tr>
<td><strong>show policy-map interface</strong></td>
<td>Displays the statistics and configurations of the input and output policies that are attached to an interface.</td>
</tr>
</tbody>
</table>
show port-security

To display the port security settings for an interface or for the switch, use the show port-security command.

```
show port-security [address] [interface interface-id]
    [interface port-channel port-channel-number] [vlan vlan-id]
```

**Syntax Description**
- `address` (Optional) Displays all secure MAC addresses for all ports or for a specific port.
- `interface interface-id` (Optional) Displays port security settings for a specific interface.
- `interface port-channel port-channel-number` (Optional) Displays port security for a specific port-channel interface.
- `vlan vlan-id` (Optional) Displays port security settings for a specific VLAN.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(18)EW</td>
<td>Support was enhanced to display sticky MAC addresses.</td>
</tr>
<tr>
<td>12.2(25)EWA</td>
<td>Support was enhanced to display settings on a per-VLAN basis.</td>
</tr>
<tr>
<td>12.2(31)SGA</td>
<td>Support was enhanced to display settings on EtherChannel interfaces.</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 the `interface-id` value or `port-channel-interface` value, the `show port-security` 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 the `interface-id` value and the `address` keyword, the `show port-security address interface` 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.

Sticky MAC addresses are addresses that persist across switch reboots and link flaps.
Examples

This example shows how to display port security settings for the entire switch:

Switch# show port-security
Secure Port  MaxSecureAddr  CurrentAddr  SecurityViolation  Security Action
             (Count)       (Count)          (Count)
Fa3/1        2            2                  0         Restrict
Fa3/2        2            2                  0         Restrict
Fa3/3        2            2                  0         Shutdown
Fa3/4        2            2                  0         Shutdown
Fa3/5        2            2                  0         Shutdown
Fa3/6        2            2                  0         Shutdown
Fa3/7        2            2                  0         Shutdown
Fa3/8        2            2                  0         Shutdown
Fa3/10       1            0                  0         Shutdown
Fa3/11       1            0                  0         Shutdown
Fa3/12       1            0                  0         Restrict
Fa3/13       1            0                  0         Shutdown
Fa3/14       1            0                  0         Shutdown
Fa3/15       1            0                  0         Shutdown
Fa3/16       1            0                  0         Shutdown
Po2          3            1                  0         Shutdown

Total Addresses in System (excluding one mac per port) :8
Max Addresses limit in System (excluding one mac per port) :3072
Global SNMP trap control for port-security :20 (traps per second)

Switch#

This example shows how to display port security settings for interface Fast Ethernet port 1:

Switch# show port-security interface fastethernet 5/1
Port Security : Enabled
Port Status : Secure-up
Violation Mode : Shutdown
Aging Time : 0 mins
Aging Type : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 1
Total MAC Addresses : 1
Configured MAC Addresses : 0
Sticky MAC Addresses : 1
Last Source Address : 0000.0001.001a
Security Violation Count : 0

Switch#

This example shows how to display all secure MAC addresses configured on all switch interfaces:

Switch# show port-security address
Secure Mac Address Table

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
<th>Remaining Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0000.0001.0000</td>
<td>SecureConfigured</td>
<td>Fa3/1</td>
<td>15 (I)</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0001</td>
<td>SecureConfigured</td>
<td>Fa3/1</td>
<td>14 (I)</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0100</td>
<td>SecureConfigured</td>
<td>Fa3/2</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0101</td>
<td>SecureConfigured</td>
<td>Fa3/2</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0200</td>
<td>SecureConfigured</td>
<td>Fa3/3</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0201</td>
<td>SecureConfigured</td>
<td>Fa3/3</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0300</td>
<td>SecureConfigured</td>
<td>Fa3/4</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0301</td>
<td>SecureConfigured</td>
<td>Fa3/4</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1000</td>
<td>SecureDynamic</td>
<td>Fa3/5</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1001</td>
<td>SecureDynamic</td>
<td>Fa3/5</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1100</td>
<td>SecureDynamic</td>
<td>Fa3/6</td>
<td>0</td>
</tr>
</tbody>
</table>
This example shows how to display the maximum allowed number of secure MAC addresses and the current number of secure MAC addresses on interface GigabitEthernet1/1:

Switch# `show port-security interface gigabitethernet1/1 vlan`
Default maximum: 22
VLAN | Maximum | Current
--- | --- | ---
2 | 22 | 3
3 | 22 | 3
4 | 22 | 3
5 | 22 | 1
6 | 22 | 2

This example shows how to display the port security settings on interface GigabitEthernet1/1 for VLANs 2 and 3:

Switch# `show port-security interface gigabitethernet1/1 vlan 2-3`
Default maximum: 22
VLAN | Maximum | Current
--- | --- | ---
2 | 22 | 3
3 | 22 | 3

This example shows how to display all secure MAC addresses configured on interface GigabitEthernet1/1 with aging information for each address.

Switch# `show port-security interface gigabitethernet1/1 address`

Secure Mac Address Table

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
<th>Remaining Age(mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0001.0001.0002</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0003</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0004</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0001.0001.0005</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0001.0001.0006</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>0001.0001.0007</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>0001.0001.0008</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Addresses: 12

This example shows how to display all secure MAC addresses configured on VLANs 2 and 3 on interface GigabitEthernet1/1 with aging information for each address:

Switch# `show port-security interface gigabitethernet1/1 address vlan 2-3`

Secure Mac Address Table

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
<th>Remaining Age(mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0001.0001.0002</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0001.0001.0003</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
</tbody>
</table>
show port-security

```
3 0001.0001.0001 SecureConfigured Gi1/1 -
3 0001.0001.0002 SecureSticky   Gi1/1 -
3 0001.0001.0003 SecureSticky   Gi1/1 -
```

Total Addresses: 12
Switch#

This example shows how to display the maximum allowed number of secure MAC addresses and the current number of secure MAC addresses on Fast Ethernet port 1:

```
Switch# show port-security interface fastethernet5/1 vlan
Default maximum: 22
VLAN  Maximum    Current
 2         22          3
 3         22          3
 5         22          1
 6         22          2
Switch#
```

This example shows how to display the port security settings on Fast Ethernet port 1 for VLANs 2 and 3:

```
Switch# show port-security interface fastethernet5/1 vlan 2-3
Default maximum: 22
VLAN  Maximum    Current
 2         22          3
 3         22          3
Switch#
```

This example shows how to display all secure MAC addresses configured on Fast Ethernet port 1 with aging information for each address.

```
Switch# show port-security interface fastethernet5/1 address
Secure Mac Address Table

Vlan  Mac Address       Type                     Ports   Remaining Age(mins)
----  ----------- ---- -----   -------------
 2    0001.0001.0001    SecureConfigured         Gi1/1        -
 2    0001.0001.0002    SecureSticky   Gi1/1        -
 2    0001.0001.0003    SecureSticky   Gi1/1        -
 3    0001.0001.0001    SecureConfigured         Gi1/1        -
 3    0001.0001.0002    SecureSticky   Gi1/1        -
 3    0001.0001.0003    SecureSticky   Gi1/1        -
 4    0001.0001.0001    SecureConfigured         Gi1/1        -
 4    0001.0001.0002    SecureSticky   Gi1/1        -
 4    0001.0001.0003    SecureSticky   Gi1/1        -
 5    0001.0001.0001    SecureConfigured         Gi1/1        -
 6    0001.0001.0001    SecureConfigured         Gi1/1        -
 6    0001.0001.0002    SecureConfigured         Gi1/1        -
```

Total Addresses: 12
Switch#

This example shows how to display all secure MAC addresses configured on VLANs 2 and 3 on Fast Ethernet port 1 with aging information for each address:

```
Switch# show port-security interface fastethernet5/1 address vlan 2-3
Secure Mac Address Table

Vlan  Mac Address       Type                     Ports   Remaining Age(mins)
----  ----------- ---- -----   -------------
 2    0001.0001.0001    SecureConfigured         Gi1/1        -
 2    0001.0001.0002    SecureSticky   Gi1/1        -
```

Switch#
Chapter 2  Cisco IOS Commands for the Catalyst 4500 Series Switches

show port-security

This example shows how to display all secure MAC addresses configured on all switch interfaces:

Switch# show port-security address

Secure Mac Address Table

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
<th>Remaining Age (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0000.0001.0000</td>
<td>SecureConfigured</td>
<td>Fa3/1</td>
<td>15 (I)</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0001</td>
<td>SecureConfigured</td>
<td>Fa3/1</td>
<td>14 (I)</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0100</td>
<td>SecureConfigured</td>
<td>Fa3/2</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0101</td>
<td>SecureConfigured</td>
<td>Fa3/2</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0200</td>
<td>SecureConfigured</td>
<td>Fa3/3</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0201</td>
<td>SecureConfigured</td>
<td>Fa3/3</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0300</td>
<td>SecureConfigured</td>
<td>Fa3/4</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.0301</td>
<td>SecureConfigured</td>
<td>Fa3/4</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1000</td>
<td>SecureDynamic</td>
<td>Fa3/5</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1001</td>
<td>SecureDynamic</td>
<td>Fa3/5</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1100</td>
<td>SecureDynamic</td>
<td>Fa3/6</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1101</td>
<td>SecureDynamic</td>
<td>Fa3/6</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1200</td>
<td>SecureSticky</td>
<td>Fa3/7</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1201</td>
<td>SecureSticky</td>
<td>Fa3/7</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1300</td>
<td>SecureSticky</td>
<td>Fa3/8</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>0000.0001.1301</td>
<td>SecureSticky</td>
<td>Fa3/8</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Addresses in System (excluding one mac per port) : 8
Max Addresses limit in System (excluding one mac per port) : 3072

Switch#

This example shows how to display the maximum allowed number of secure MAC addresses and the current number of secure MAC addresses on interface Gigabitethernet1/1:

Switch# show port-security interface gigabitethernet1/1 vlan

Default maximum: 22

<table>
<thead>
<tr>
<th>VLAN</th>
<th>Maximum</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
<td>2</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the port security settings on interface Gigabitethernet1/1 for VLANs 2 and 3:

Switch# show port-security interface gigabitethernet1/1 vlan 2-3

Default maximum: 22

<table>
<thead>
<tr>
<th>VLAN</th>
<th>Maximum</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
<td>3</td>
</tr>
</tbody>
</table>

Switch#
This example shows how to display all secure MAC addresses configured on interface Gigabitethernet1/1 with aging information for each address.

Switch# `show port-security interface gigabitethernet1/1 address`

Secure Mac Address Table

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
<th>Remaining Age(mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0001.0001.0002</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0002</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0003</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0001.0001.0003</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>0001.0001.0002</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Addresses: 12

Switch#

This example shows how to display all secure MAC addresses configured on VLANs 2 and 3 on interface Gigabitethernet1/1 with aging information for each address:

Switch# `show port-security interface gigabitethernet1/1 address vlan 2-3`

Secure Mac Address Table

<table>
<thead>
<tr>
<th>Vlan</th>
<th>Mac Address</th>
<th>Type</th>
<th>Ports</th>
<th>Remaining Age(mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0001.0001.0002</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0001.0001.0003</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0001</td>
<td>SecureConfigured</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0002</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0001.0001.0003</td>
<td>SecureSticky</td>
<td>Gi1/1</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Addresses: 12

Switch#

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>switchport port-security</code></td>
<td>Enables port security on an interface.</td>
</tr>
</tbody>
</table>
show power

To display information about the power status, use the show power command.

```
show power {available | capabilities | detail | inline {[interface] detail | consumption default | module mod default} | module | status | supplies}
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>available</td>
<td>(Optional) Displays the available system power.</td>
</tr>
<tr>
<td>capabilities</td>
<td>(Optional) Displays the individual power supply capabilities.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Displays detailed information on power resources.</td>
</tr>
<tr>
<td>inline</td>
<td>(Optional) Displays the PoE status.</td>
</tr>
<tr>
<td>interface detail</td>
<td>(Optional) Detailed information on the PoE status for the interface</td>
</tr>
<tr>
<td>consumption default</td>
<td>(Optional) Displays the PoE consumption.</td>
</tr>
<tr>
<td>module mod default</td>
<td>(Optional) Displays the PoE consumption for the specified module.</td>
</tr>
<tr>
<td>status</td>
<td>(Optional) Displays the power supply status.</td>
</tr>
<tr>
<td>supplies</td>
<td>(Optional) Displays the number of power supplies needed by the system.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)SG</td>
<td>Displays inline power handling for the Supervisor Engine II-Plus-TS.</td>
</tr>
<tr>
<td>12.2(52)SG</td>
<td>Support to display detailed PoE consumption information on an interface/module.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

If a powered device is connected to an interface with external power, the switch does not recognize the powered device. The Device column in the output of the show power inline command displays as unknown.

If your port is not capable of supporting PoE, you will receive this message:

```
Power over Ethernet not supported on interface Admin
```

The show power inline interface module command displays the amount of power that is used to operate a Cisco IP Phone. To view the amount of power requested, use the show cdp neighbors command.

Because FPGAs and other hardware components on the WS-X4548-RJ45V+ and WS-X4648-RJ45V+E modules consume PoE, the operating PoE consumption for an 802.3af-compliant module can be nonzero when there are no powered devices attached to the module. The operating PoE can vary by as much as 20 W because of fluctuations in the PoE that is consumed by the hardware components.
### Examples

This example shows how to display information about the general power supply:

```
Switch# show power

Power Supply         Model No          Type     Status      Fan Sensor Inline Status
-------------------  ----------------  ---------  -----------  ------  ------  ------
PS1                 PWR-C45-2800AC    AC 2800W  good         good    good    good
PS2                 PWR-C45-1000AC    AC 1000W  err-disable  good    n.a.

*** Power Supplies of different type have been detected***

Power supplies needed by system : 1
Power supplies currently available : 1

Power Summary

<table>
<thead>
<tr>
<th>(in Watts)</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>System Power (12V)</td>
<td>328</td>
</tr>
<tr>
<td>Inline Power (-50V)</td>
<td>0</td>
</tr>
<tr>
<td>Backplane Power (3.3V)</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Total Used</td>
</tr>
</tbody>
</table>
```

This example shows how to display the amount of available system power:

```
Switch# show power available

Power Summary

<table>
<thead>
<tr>
<th>(in Watts)</th>
<th>Available</th>
<th>Used</th>
<th>Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Power</td>
<td>1360</td>
<td>280</td>
<td>1080</td>
</tr>
<tr>
<td>Inline Power</td>
<td>1400</td>
<td>0</td>
<td>1400</td>
</tr>
<tr>
<td>Maximum Power</td>
<td>2800</td>
<td>280</td>
<td>2520</td>
</tr>
</tbody>
</table>
```

**Note**

The “Inline Power Oper” column displays the PoE consumed by the powered devices attached to the module in addition to the PoE consumed by the FPGAs and other hardware components on the module. The “Inline Power Admin” column displays only the PoE allocated by the powered devices attached to the module.

This example shows how to display the power status information:

```
Switch# show power status

Power Supply         Model No          Type     Status      Fan Sensor Inline Status
-------------------  ----------------  ---------  -----------  ------  ------  ------
PS1                 PWR-C45-2800AC    AC 2800W  good         good    good    good
PS2                 PWR-C45-1000AC    AC 1000W  err-disable  good    n.a.

Power Summary

<table>
<thead>
<tr>
<th>(Nos in Watts)</th>
<th>Max</th>
<th>Min</th>
<th>Max</th>
<th>Min</th>
<th>Absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1</td>
<td>1400</td>
<td>1400</td>
<td>1360</td>
<td>1360</td>
<td>2800</td>
</tr>
<tr>
<td>PS2</td>
<td>1400</td>
<td>1400</td>
<td>1360</td>
<td>1360</td>
<td>2800</td>
</tr>
</tbody>
</table>
```

This example shows how to verify the PoE consumption for the switch:

```
Switch# show power inline consumption default
Default PD consumption : 5000 mW
Switch#
```
This example shows how to display the status of inline power:

```
Switch# show power inline
Available:677(w) Used:117(w) Remaining:560(w)
```

<table>
<thead>
<tr>
<th>Interface Admin</th>
<th>Oper</th>
<th>Power (Watts)</th>
<th>Device</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>From PS</td>
<td>To Device</td>
<td></td>
</tr>
<tr>
<td>Fa3/1</td>
<td>auto</td>
<td>17.3</td>
<td>15.4</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/2</td>
<td>auto</td>
<td>4.5</td>
<td>4.0</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/3</td>
<td>auto</td>
<td>7.1</td>
<td>6.3</td>
<td>Cisco IP Phone 7960</td>
</tr>
<tr>
<td>Fa3/4</td>
<td>auto</td>
<td>7.1</td>
<td>6.3</td>
<td>Cisco IP Phone 7960 n/a</td>
</tr>
<tr>
<td>Fa3/5</td>
<td>auto</td>
<td>17.3</td>
<td>15.4</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/6</td>
<td>auto</td>
<td>17.3</td>
<td>15.4</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/7</td>
<td>auto</td>
<td>4.5</td>
<td>4.0</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/8</td>
<td>auto</td>
<td>7.9</td>
<td>7.0</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/9</td>
<td>auto</td>
<td>17.3</td>
<td>15.4</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/10</td>
<td>auto</td>
<td>17.3</td>
<td>15.4</td>
<td>Ieee PD</td>
</tr>
<tr>
<td>Fa3/11</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Fa3/12</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Fa3/13</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Fa3/14</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Fa3/15</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Fa3/16</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Fa3/17</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Fa3/18</td>
<td>auto</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Totals: 10 on 117.5 104.6

Switch#

This example shows how to display the number of power supplies needed by the system:

```
Switch# show power supplies
Power supplies needed by system = 2
```

Switch#

This example shows how to display the PoE status for Fast Ethernet interface 3/1:

```
Switch# show power inline fastethernet3/1
Available:677(w) Used:11(w) Remaining:666(w)
```

<table>
<thead>
<tr>
<th>Interface Admin</th>
<th>Power (Watts)</th>
<th>Device</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From PS</td>
<td>To Device</td>
<td></td>
</tr>
<tr>
<td>Fa3/1</td>
<td>11.2</td>
<td>10.0</td>
<td>Ieee PD</td>
</tr>
</tbody>
</table>

```
Interface AdminPowerMax AdminConsumption
(Watts) (Watts)

Fa3/1 15.4 10.0
```

Switch#

**Note** When the Supervisor Engine II+TS is used with the 1400 W DC power supply (PWR-C45-1400DC), and only one 12.5 A input of the DC power supply is used, the supervisor engine’s power consumption may vary depending on whether there is any linecard inserted at slot 2 and 3, as well as on the type of linecards inserted. This amount varies between 155 W and 330 W. This variability also affects the
maximum amount of available supervisor engine inline power, which can also vary from 0 W to 175 W. Therefore, it is possible for a supervisor engine to deny inline power to some connected inline power devices when one or more linecards are inserted into the chassis.

The output of the commands `show power detail` and `show power module` display the supervisor engine’s variable power consumption and its inline power summary:

```
Switch# show power detail
sh power detail
Power Supply Model No Type Status Fan Sensor Inline Status
--- -------------------- -------- --- ------- --- --- ---
PS1  PWR-C45-1400DC   DCSP1400W good good  n.a.  n.a.
PS1-1                       12.5A  good
PS1-2                       15.0A  off
PS1-3                       15.0A  off
PS2  none                     --   --   --   --   --   --
Power supplies needed by system : 1
Power supplies currently available : 1
Power Summary (in Watts) Used Available
System Power (12V) 360 360
Inline Power (-50V) 0 0
Backplane Power (3.3V) 0 40
Total 360 400
Module Inline Power Summary (Watts)
(12V -> -48V on board conversion)

Maximum
Mod Used Available
--- --- --- ---
1 5 25

Watts Used of System Power (12V)
currently out of reset in reset
--- --- --- ---
1 180 180 180
2 60 60 20
3 90 90 50
-- 30 -- --
Total 360 330 250

Watts used of Chassis Inline Power (-50V)

Watts used of Module Inline Power (12V -> -50V)
```
Switch# `show power module`
Power fail interrupts received on slot 1: 0
Power fail interrupts received on slot 2: 0

Debounce value for power fail status: 0 microseconds

<table>
<thead>
<tr>
<th>Mod</th>
<th>Model</th>
<th>Watts Used of System Power (12V)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>budgeted</td>
</tr>
<tr>
<td>1</td>
<td>WS-X4748-RJ45V+E</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>WS-X4712-SFP+E</td>
<td>90</td>
</tr>
<tr>
<td>5</td>
<td>WS-X45-SUP7-E</td>
<td>260</td>
</tr>
<tr>
<td>--</td>
<td>Fan Tray</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Switch#

**Note**

“Watts budgeted” is not relevant for C4500-X series switches.

This example shows how to display detailed information on the PoE status for Gigabit interface 2/1:

Switch# `show power inline g2/1 detail`
Available: 800 (w) Used: 71 (w) Remaining: 729 (w)

Interface: Gi2/1
Inline Power Mode: auto
Operational status: on
Device Detected: yes
Device Type: Cisco IP Phone 7970
IEEE Class: 3
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 11.0
Power available to the device: 10.3

Actual consumption
Measured at the port: 5.0
Maximum Power drawn by the device since powered on: 5.2

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Switch#
This example shows how to display the PoE status for all all ports of the module:

Switch# show module
Chassis Type: WS-C4503-E

Power consumed by backplane: 0 Watts

Mod Ports Card Type Model Serial No.
---+-----+--------------------------------------+----------------+----
1  6  Sup 6-E 10GE (X2), 1000BaseX (SFP) WS-X45-SUP6-E JAE1132SXRP
3 48 10/100/1000BaseT POE E Series WS-X4648-RJ45V-E JAE114740YF

MAC addresses Hw Fw Sw Status
---+---+---+---
1 0017.94c8.f580 to 0017.94c8.f585 0.4 12.2(44r)SG( 12.2(52) Ok
3 001e.7af1.f5d0 to 001e.7af1.f5ff 1.0 Ok

Switch# show power inline module 3 detail
Available: 800(w) Used: 0(w) Remaining: 800(w)

Interface: Gi3/1
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/2
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
show power

Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/3
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/4
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/5
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/6
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>power dc input</td>
<td>Configures the power DC input parameters on the switch.</td>
</tr>
<tr>
<td>power inline</td>
<td>Sets the inline-power state for the inline-power-capable interfaces.</td>
</tr>
<tr>
<td>power inline consumption</td>
<td>Sets the default power that is allocated to an interface for all the inline-power-capable interfaces on the switch.</td>
</tr>
<tr>
<td>power redundancy-mode</td>
<td>Configures the power settings for the chassis.</td>
</tr>
</tbody>
</table>
show power inline police

To display PoE policing and monitoring status, use the show power inline police command.

```
show power inline police [interfacename] [module n]
```

**Syntax Description**

- `interfacename` (optional) Displays PoE policing and monitoring status for a particular interface.
- `module n` (optional) Display PoE policing and monitoring status for all interfaces on this module.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(50)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The Oper Power field displays the true power consumption of the connected device.

The `show power inline police` command with no keywords displays PoE policing status for all interfaces in the chassis.

If this command is executed at the global level, the last line of the output under Oper Power field displays the total true inline power consumption of all devices connected to the switch.

**Examples**

This example shows how to display PoE policing status for a interface GigabitEthernet 2/1:

```
Switch# show power inline police gigabitEthernet 2/1
Available:421(w) Used:44(w) Remaining:377(w)

Interface   Admin  Oper   Admin  Oper   Cutoff  Oper
State       State  Police  Police  Power  Power
-----------  ------  -------  -------  ------  ------
Gi2/1       auto    on      errdisable ok  22.6   9.6
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>power inline police</td>
<td>Configures PoE policing on a particular interface.</td>
</tr>
</tbody>
</table>
show pppoe intermediate-agent interface

To display PPPoE Intermediate Agent configuration and statistics (packet counters), use the show pppoe intermediate-agent interface command.

show pppoe intermediate-agent information interface

show pppoe intermediate-agent statistics interface

Syntax Description

interface interface Interface for which information or statistics are displayed.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release Modification

12.2(50)SG Support for this command was introduced on the Catalyst 4500 series switch.

Examples

This example shows how to display PPPoE Intermediate Agent configuration:

Switch# show pppoe intermediate-agent information
Switch PPPoE Intermediate-Agent is enabled
PPPoE Intermediate-Agent trust/rate is configured on the following Interfaces:
Interface IA Trusted Vsa Strip Rate limit (pps)
------------------------------------------ ------- ------- ------- ----------------
GigabitEthernet3/4 no yes yes unlimited
PPPoE Intermediate-Agent is configured on following VLANs:
2-3
GigabitEthernet3/7 no no no unlimited
PPPoE Intermediate-Agent is configured on following VLANs:
2-3

This example shows how to display PPPoE Intermediate Agent statistics on an interface:

Switch# show pppoe intermediate-agent statistics interface g3/7
Interface : GigabitEthernet3/7
Packets received
All = 3
PADI = 0 PADO = 0
PADR = 0 PADS = 0
PADT = 3
Packets dropped:
Rate-limit exceeded = 0
Server responses from untrusted ports = 0
Client requests towards untrusted ports = 0
Malformed PPPoE Discovery packets = 0
Vlan 2: Packets received PADI = 6 PADO = 0 PADR = 6 PADS = 0 PADT = 6
Vlan 3: Packets received PADI = 4 PADO = 0 PADR = 4 PADS = 0 PADT = 4
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pppoe intermediate-agent (global)</code></td>
<td>Enables the PPPoE Intermediate Agent feature on a switch.</td>
</tr>
<tr>
<td><code>pppoe intermediate-agent format-type (global)</code></td>
<td>Sets the access-node-identifier, generic-error-message, and identifier-string for the switch.</td>
</tr>
<tr>
<td><code>pppoe intermediate-agent (interface)</code></td>
<td>Enables the PPPoE Intermediate Agent feature on an interface.</td>
</tr>
<tr>
<td><code>pppoe intermediate-agent format-type (interface)</code></td>
<td>Sets circuit-id or remote-id for an interface.</td>
</tr>
</tbody>
</table>
show qos

To display QoS information, use the show qos command.

show qos

Syntax Description

This command has no arguments or keywords.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release Modification
12.1(8a)EW Support for this command was introduced on the Catalyst 4500 series switch.

Usage Guidelines

This command is not supported on the Supervisor Engine 6-E and Catalyst 4900M chassis.

Examples

This example shows the output that might be displayed if you do not enter any keywords:

```bash
Switch# show qos
QoS is enabled globally
Switch#
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos account layer-all encapsulation</td>
<td>Globally enables QoS functionality on the switch.</td>
</tr>
</tbody>
</table>
show qos aggregate policer

To display QoS aggregate policer information, use the `show qos aggregate policer` command.

```
show qos aggregate policer [aggregate_name]
```

**Syntax Description**

- `aggregate_name` (Optional) Named aggregate policer.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command is not supported on the Supervisor Engine 6-E and Catalyst 4900M chassis.

The aggregate policer name is case sensitive.

**Examples**

This example shows the output if you do not enter any keywords:

```
Switch# show qos aggregate policer
Policer aggr-1
Rate(bps):10000000 Normal-Burst(bytes):1000000
conform-action:transmit exceed-action:policed-dscp-transmit
Policymaps using this policer:
  ipp5-policy
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos trust</td>
<td>Defines a named aggregate policer.</td>
</tr>
</tbody>
</table>
show qos dbl

To display global Dynamic Buffer Limiting (DBL) information, use the show qos dbl command.

```
show qos dbl
```

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

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
This command is not supported on the Supervisor Engine 6-E and Catalyst 4900M chassis.

**Examples**
This example shows how to display global DBL information:

```
Switch# show qos dbl
DBL is enabled globally
DBL flow includes vlan
DBL flow includes 14-ports
DBL does not use ecn to indicate congestion
DBL exceed-action mark probability:15%
DBL max credits:15
DBL aggressive credit limit:10
DBL aggressive buffer limit:2 packets
DBL DSCPw with default drop probability:1-10
Switch#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos account layer-all encapsulation</td>
<td>Globally enables QoS functionality on the switch.</td>
</tr>
</tbody>
</table>
show qos interface

To display queueing information, use the `show qos interface` command.

```
show qos interface {fastethernet interface-number | gigabitethernet interface-number} | [vlan vlan_id | port-channel number]
```

**Syntax Description**

- `fastethernet interface-number`: Specifies the Fast Ethernet 802.3 interface.
- `gigabitethernet interface-number`: Specifies the Gigabit Ethernet 802.3z interface.
- `vlan vlan_id`: (Optional) Specifies the VLAN ID; valid values are from 1 to 4094.
- `port-channel number`: (Optional) Specifies the port channel; valid ranges are from 1 to 64.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(13)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
<tr>
<td>12.1(19)EW</td>
<td>Display changed to include the Port Trust Device.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command is not supported on the Supervisor Engine 6-E and Catalyst 4900M chassis.

**Examples**

This example shows how to display queueing information:

```
Switch# show qos interface fastethernet 6/1
QoS is enabled globally
Port QoS is enabled
 Administrative Port Trust State: 'dscp'
 Operational Port Trust State: 'untrusted'
 Port Trust Device: 'cisco-phone'
 Default DSCP:0 Default CoS:0

<table>
<thead>
<tr>
<th>Tx-Queue</th>
<th>Bandwidth (bps)</th>
<th>ShapeRate (bps)</th>
<th>Priority</th>
<th>QueueSize (packets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31250000</td>
<td>disabled</td>
<td>N/A</td>
<td>240</td>
</tr>
<tr>
<td>2</td>
<td>31250000</td>
<td>disabled</td>
<td>N/A</td>
<td>240</td>
</tr>
<tr>
<td>3</td>
<td>31250000</td>
<td>disabled</td>
<td>normal</td>
<td>240</td>
</tr>
<tr>
<td>4</td>
<td>31250000</td>
<td>disabled</td>
<td>N/A</td>
<td>240</td>
</tr>
</tbody>
</table>

Switch#
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show qos</td>
<td>Displays QoS information.</td>
</tr>
<tr>
<td>tx-queue</td>
<td>Configures the transmit queue parameters for an interface.</td>
</tr>
</tbody>
</table>
show qos maps

To display QoS map information, use the **show qos maps** command.

```
show qos maps [cos | dscp [policed | tx-queue]]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cos</td>
<td>(Optional) Displays CoS map information.</td>
</tr>
<tr>
<td>dscp</td>
<td>(Optional) Displays DSCP map information.</td>
</tr>
<tr>
<td>policed</td>
<td>(Optional) Displays policed map information.</td>
</tr>
<tr>
<td>tx-queue</td>
<td>(Optional) Displays tx-queue map information.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
</table>
| 12.1(8a)EW | Support for this command was introduced on the Catalyst 4500 series switch.

**Usage Guidelines**

This command is not supported on the Supervisor Engine 6-E and Catalyst 4900M chassis.

**Examples**

This example shows how to display QoS map settings:

```
Switch# show qos maps
DSCP-TxQueue Mapping Table (dscp = d1d2)
d1 :d2  0  1  2  3  4  5  6  7  8  9
-------------------------------------
0 :   01 01 01 01 01 01 01 01 01 01
1 :   01 01 01 01 01 02 02 02 02 02
2 :   02 02 02 02 02 02 02 02 02 02
3 :   02 02 03 03 03 03 03 03 03 03
4 :   03 03 03 03 03 03 03 03 03 03
5 :   04 04 04 04 04 04 04 04 04 04
6 :   04 04 04 04
Policed DSCP Mapping Table (dscp = d1d2)
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
```
show qos maps

DSCP-CoS Mapping Table (dscp = d1d2)

\[
d1 : d2 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9
\]

<table>
<thead>
<tr>
<th>d1</th>
<th>d2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>00 00 00 00 00 00 00 00 01 01</td>
</tr>
<tr>
<td>1</td>
<td>01 01 01 01 01 01 02 02 02 02</td>
</tr>
<tr>
<td>2</td>
<td>02 02 02 02 03 03 03 03 03 03</td>
</tr>
<tr>
<td>3</td>
<td>03 03 04 04 04 04 04 04 04 04</td>
</tr>
<tr>
<td>4</td>
<td>05 05 05 05 05 05 05 05 05 05</td>
</tr>
<tr>
<td>5</td>
<td>06 06 06 06 06 06 06 07 07 07</td>
</tr>
<tr>
<td>6</td>
<td>07 07 07 07</td>
</tr>
</tbody>
</table>

CoS-DSCP Mapping Table

<table>
<thead>
<tr>
<th>CoS: 0 1 2 3 4 5 6 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSCP: 0 8 16 24 32 40 48 56</td>
</tr>
</tbody>
</table>

Switch#

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>qos account layer-all encapsulation</strong></td>
<td>Globally enables QoS functionality on the switch.</td>
</tr>
</tbody>
</table>
**show redundancy**

To display redundancy facility information, use the `show redundancy` command.

```
show redundancy {clients | counters | history | states}
```

**Syntax Description**

- **clients** (Optional) Displays information about the redundancy facility client.
- **counters** (Optional) Displays information about the redundancy facility counter.
- **history** (Optional) Displays a log of past status and related information for the redundancy facility.
- **states** (Optional) Displays information about the redundancy facility state, such as disabled, initialization, standby, active.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1.(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch (Catalyst 4507R only).</td>
</tr>
<tr>
<td>12.2(31)SGA</td>
<td>Support for ISSU was introduced.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display information about the redundancy facility:

```
Switch# show redundancy
Switch# show redundancy
4507r-demo#show redundancy
Redundant System Information :
--------------------------------
Available system uptime = 2 days, 2 hours, 39 minutes
Switchovers system experienced = 0
  Standby failures = 0
  Last switchover reason = none

  Hardware Mode = Duplex
  Configured Redundancy Mode = Stateful Switchover
  Operating Redundancy Mode = Stateful Switchover
  Maintenance Mode = Disabled
  Communications = Up

Current Processor Information :
--------------------------------
  Active Location = slot 1
  Current Software state = ACTIVE
  Uptime in current state = 2 days, 2 hours, 39 minutes
  Image Version = Cisco Internetwork Operating System Software
  IOS (tm) Catalyst 4000 L3 Switch Software (cat4000-I5S-M), Version 12.2(20)EWA(3 .92), CISCO INTERNAL USE ONLY ENHANCED PRODUCTION VERSION
```
This example shows how to display redundancy facility client information:

```
Switch# show redundancy clients
clientID = 0       clientSeq = 0        RF_INTERNAL_MSG
clientID = 30      clientSeq = 135      Redundancy Mode RF
clientID = 28      clientSeq = 330      GALIOS_CONFIG_SYNC
clientID = 65000   clientSeq = 65000    RF_LAST_CLIENT Switch
```

The output displays the following information:

- `clientID` displays the client’s ID number.
- `clientSeq` displays the client’s notification sequence number.
- Current redundancy facility state.

This example shows how to display the redundancy facility counter information:

```
Switch# show redundancy counters
Redundancy Facility OMs
    comm link up = 1
    comm link down down = 0
    invalid client tx = 0
    null tx by client = 0
    tx failures = 0
    tx msg length invalid = 0
    client not rxing msgs = 0
    rx peer msg routing errors = 0
    null peer msg rx = 0
    errored peer msg rx = 0
    buffers tx = 1535
    tx buffers unavailable = 0
    buffers rx = 1530
    buffer release errors = 0
    duplicate client registers = 0
    failed to register client = 0
    Invalid client syncs = 0
Switch#
```
This example shows how to display redundancy facility history information:

```
Switch# show redundancy history
00:00:01 client added: RF_INTERNAL_MSG(0) seq=0
00:00:01 client added: RF_LAST_CLIENT(65000) seq=65000
00:00:01 client added: GALIOS_CONFIG_SYNC(28) seq=330
00:00:03 client added: Redundancy Mode RF(30) seq=135
00:00:03 *my state = INITIALIZATION(2) *peer state = DISABLED(1)
00:00:03 RF_PROG_INITIALIZATION(100) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:03 RF_PROG_INITIALIZATION(100) Redundancy Mode RF(30) op=0 rc=11
00:00:03 RF_PROG_INITIALIZATION(100) GALIOS_CONFIG_SYNC(28) op=0 rc=11
00:00:03 RF_PROG_INITIALIZATION(100) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:03 *my state = NEGOTIATION(3) peer state = DISABLED(1)
00:00:25 RF_EVENT_GO_ACTIVE(511) op=0
00:00:25 *my state = ACTIVE-FAST(9) peer state = DISABLED(1)
00:00:25 RF_STATUS_MAINTENANCE_ENABLE(403) Redundancy Mode RF(30) op=0
00:00:25 RF_STATUS_MAINTENANCE_ENABLE(403) GALIOS_CONFIG_SYNC(28) op=0
00:00:25 RF_PROG_ACTIVE_FAST(200) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_FAST(200) Redundancy Mode RF(30) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_FAST(200) GALIOS_CONFIG_SYNC(28) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_FAST(200) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:25 *my state = ACTIVE-DRAIN(10) peer state = DISABLED(1)
00:00:25 RF_PROG_ACTIVE_DRAIN(201) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_DRAIN(201) Redundancy Mode RF(30) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_DRAIN(201) GALIOS_CONFIG_SYNC(28) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_DRAIN(201) RF_LAST_CLIENT(65000) op=0 rc=11
00:01:34 RF_PROG_PLATFORM_SYNC(300) RF_INTERNAL_MSG(0) op=0 rc=0
00:01:34 RF_PROG_PLATFORM_SYNC(300) Redundancy Mode RF(30) op=0 rc=11
00:01:34 RF_PROG_PLATFORM_SYNC(300) GALIOS_CONFIG_SYNC(28) op=0 rc=0
00:01:34 RF_EVENT_CLIENT_PROGRESSION(503) GALIOS_CONFIG_SYNC(28) op=1 rc=0
00:01:36 RF_EVENT_PEER_PROGRESSION(506) GALIOS_CONFIG_SYNC(28) op=300
00:01:36 RF_PROG_PLATFORM_SYNC(300) RF_LAST_CLIENT(65000) op=0 rc=0
00:01:36 RF_EVENT_CLIENT_PROGRESSION(503) RF_LAST_CLIENT(65000) op=1 rc=0
00:01:36 RF_EVENT_PEER_PROGRESSION(506) RF_LAST_CLIENT(65000) op=300
00:01:38 *my state = ACTIVE(13) *peer state = STANDBY COLD(4)
Switch#
```

This example shows how to display information about the redundancy facility state:

```
Switch# show redundancy states
my state = 13 -ACTIVE
    peer state = 8  -STANDBY HOT
    Mode = Duplex
    Unit = Primary
    Unit ID = 2

Redundancy Mode (Operational) = Stateful Switchover
Redundancy Mode (Configured) = Stateful Switchover
    Split Mode = Disabled
    Manual Swact = Enabled
    Communications = Up
    client count = 21
    client_notification_TMR = 240000 milliseconds
    keep_alive TMR = 9000 milliseconds
    keep_alive count = 0
    keep_alive threshold = 18
    RF debug mask = 0x0
Switch#
```
<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>redundancy</td>
<td>Enters the redundancy configuration mode.</td>
</tr>
<tr>
<td></td>
<td>redundancy force-swtchov</td>
<td>Forces a switchover from the active to the standby supervisor engine.</td>
</tr>
</tbody>
</table>
show redundancy config-sync

To display an ISSU config-sync failure or the ignored mismatched command list (MCL), if any, use the `show redundancy config-sync` command.

```
show redundancy config-sync {failures | ignored} {bem | mcl | prc}
show redundancy config-sync ignored failures mcl
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>failures</td>
<td>Displays MCL entries or BEM/PRC failures.</td>
</tr>
<tr>
<td>ignored</td>
<td>Displays the ignored MCL entries.</td>
</tr>
<tr>
<td>bem</td>
<td>(Deprecated)</td>
</tr>
<tr>
<td>mcl</td>
<td>Displays commands that exist in the active supervisor engine’s running configuration, but are not supported by the image on the standby supervisor engine.</td>
</tr>
<tr>
<td>prc</td>
<td>Displays a Parser Return Code (PRC) failure and forces the system to operate in RPR mode provided there is a mismatch in the return code for a command execution at the active and standby supervisor engine.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(31)SGA</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(44)SG</td>
<td>Updated command syntax from issu config-sync to redundancy config-sync.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

When two versions of Cisco IOS images are involved, the command sets supported by two images might differ. If any of those mismatched commands are executed on the active supervisor engine, the standby supervisor engine might not recognize those commands. This causes a config mismatch condition. If the syntax check for the command fails on standby supervisor engine during a bulk sync, the command is moved into the MCL and the standby supervisor engine is reset. To display all the mismatched commands, use the `show redundancy config-sync failures mcl` command.
To clean the MCL, follow these steps:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove all mismatched commands from the active supervisor engines’ running configuration.</td>
</tr>
<tr>
<td>2</td>
<td>Revalidate the MCL with a modified running configuration using the <code>redundancy config-sync validate mismatched-commands</code> command.</td>
</tr>
<tr>
<td>3</td>
<td>Reload the standby supervisor engine.</td>
</tr>
</tbody>
</table>

Alternatively, you could ignore the MCL by following these steps:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enter the <code>redundancy config-sync ignore mismatched-commands</code> command.</td>
</tr>
<tr>
<td>2</td>
<td>Reload the standby supervisor engine; the system transitions to SSO mode.</td>
</tr>
</tbody>
</table>

**Note** If you ignore the mismatched commands, the out-of-sync configuration at the active supervisor engine and the standby supervisor engine still exists.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>You can verify the ignored MCL with the <code>show redundancy config-sync ignored mcl</code> command.</td>
</tr>
</tbody>
</table>

Each command sets a return code in the action function that implements the command. This return code indicates whether or not the command successfully executes. The active supervisor engine maintains the PRC after executing a command. The standby supervisor engine executes the command and sends PRC back to the active supervisor engine. PRC failure occurs if these two PRCs do not match. If a PRC error occurs at the standby supervisor engine either during bulk sync or LBL sync, the standby supervisor engine is reset. To display all PRC failures, use the `show redundancy config-sync failures prc` command.

To display best effort method (BEM) errors, use the `show redundancy config-sync failures bem` command.

**Examples**

The following example shows how to display the ISSU BEM failures:

```
Switch# show redundancy config-sync failures bem
BEM Failed Command List
----------------------------------

The list is Empty
Switch#
```

The following example shows how to display the ISSU MCL failures:

```
Switch# show redundancy config-sync failures mcl
Mismatched Command List
-----------------------

The list is Empty
Switch#
```
The following example shows how to display the ISSU PRC failures:

Switch# `show redundancy config-sync failures prc`
PRC Failed Command List
-------------------------------
interface FastEthernet3/2
! <submode> "interface"
- channel-protocol pagp
! </submode> "interface"

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>redundancy config-sync</code></td>
<td>Moves the active supervisor engine into the Mismatched Command List (MCL) and resets the standby supervisor engine.</td>
</tr>
<tr>
<td></td>
<td><code>mismatched-commands</code></td>
<td></td>
</tr>
</tbody>
</table>
show running-config

To display the module status and configuration, use the `show running-config` command.

```
show running-config [module slot]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>module slot (Optional)</td>
<td>Specifies the module slot number; valid values are from 1 to 6.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

In some cases, you might see a difference in the duplex mode displayed when you enter the `show interfaces` command and the `show running-config` command. If you do see a difference, the duplex mode displayed in the `show interfaces` command is the actual duplex mode that the interface is running. The `show interfaces` command shows the operating mode for an interface, while the `show running-config` command shows the configured mode for an interface.

The `show running-config` command output for an interface may display a duplex mode configuration but no configuration for the speed. When no speed is displayed in the output, it indicates that the interface speed is configured to be auto and that the duplex mode shown becomes the operational setting once the speed is configured to something other than auto. With this configuration, it is possible that the operating duplex mode for that interface does not match the duplex mode shown with the `show running-config` command.

**Examples**

This example shows how to display the module and status configuration for all modules:

```
Switch# show running-config
03:23:36:%SYS-5-CONFIG_I:Configured from console by console
Building configuration...

Current configuration:3268 bytes
!
version 12.1
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Switch
!
!
power supplies required 1
ip subnet-zero
```
This example shows the output for the `show running-config` command when you have enabled the `switchport voice vlan` command:

```
Switch# show running-config int fastethernet 6/1
Building configuration...

Current configuration:133 bytes
!
interface FastEthernet6/1
  switchport voice vlan 2
  no snmp trap link-status
  spanning-tree portfast
  channel-group 1 mode on
end

Switch#
```
show shell functions

Use the **show shell functions** command to display configurations for all builtin shell functions.

```
show shell functions
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>No keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defaults</td>
<td>None</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Privileged EXEC</td>
</tr>
</tbody>
</table>

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command only displays the contents of builtin shell functions. To display the contents of user created functions, use the **show shell triggers** command.

**Examples**

This example illustrates how to display configurations included for all the shell functions:

```
Switch# show shell functions
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>shell trigger</strong></td>
<td>Creates a user defined trigger.</td>
</tr>
<tr>
<td><strong>show shell triggers</strong></td>
<td>Configures a user defined trigger.</td>
</tr>
</tbody>
</table>
**show shell triggers**

Use the **show shell triggers** command to display detail for all supported built-in and user created triggers.

```
show shell triggers
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>No keywords</td>
<td></td>
</tr>
</tbody>
</table>

**Defaults**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

This command displays built-in triggers and user defined triggers (with their mapped functions).

**Examples**

This example illustrates how to display detail for all supported triggers:

```
Switch# show shell triggers
Trigger Id: testGroup
Trigger description: testGroup
Trigger environment:
Trigger mapping function:
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>shell trigger</strong></td>
<td>Creates a user defined trigger.</td>
</tr>
<tr>
<td><strong>show shell functions</strong></td>
<td>Displays configurations included for all the built-in functions including user created and built-in functions.</td>
</tr>
</tbody>
</table>
show slavebootflash:

To display information about the standby bootflash file system, use the show slavebootflash: command.

```
show slavebootflash: [all | chips | filesys]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>(Optional) Displays all possible Flash information.</td>
</tr>
<tr>
<td>chips</td>
<td>(Optional) Displays Flash chip information.</td>
</tr>
<tr>
<td>filesys</td>
<td>(Optional) Displays file system information.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Examples

This example shows how to display file system status information:

```
Switch# show slavebootflash: filesys

-------- F I L E   S Y S T E M   S T A T U S --------
Device Number = 0
DEVICE INFO BLOCK: bootflash
Magic Number  = 6887635  File System Vers  = 10000  (1.0)
Length       = 10000000  Sector Size    = 40000
Programming Algorithm = 39  Erased State  = FFFFFFFF
File System Offset = 40000  Length = F40000
MONLIB Offset  = 100  Length = C628
Bad Sector Map Offset = 3FFF8  Length = 8
Squeeze Log Offset = F80000  Length = 40000
Squeeze Buffer Offset = PC0000  Length = 40000
Num Spare Sectors = 0
Spares:
STATUS INFO:
Writable
NO File Open for Write
Complete Stats
No Unrecovered Errors
No Squeeze in progress
USAGR INFO:
Bytes Used    = 917CE8  Bytes Available = 628318
Bad Sectors   = 0  Spared Sectors = 0
OK Files      = 2  Bytes = 917BE8
Deleted Files = 0  Bytes = 0
Files w/Errors = 0  Bytes = 0
Switch>
```
This example shows how to display system image information:

Switch# **show slavebootflash:**
-# - ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
1   .. image  8C5A393A  237E3C   14  2063804 Aug 23 1999 16:18:45 c4-boot-mz
2   .. image  D86EE0AD  957CE8    9  7470636 Sep 20 1999 13:48:49 rp.halley
Switch>

This example shows how to display all bootflash information:

Switch# **show slavebootflash:** all
-# - ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
1   .. image  8C5A393A  237E3C   14  2063804 Aug 23 1999 16:18:45 c4-boot-mz
2   .. image  D86EE0AD  957CE8    9  7470636 Sep 20 1999 13:48:49 rp.halley

6456088 bytes available (9534696 bytes used)

-------- F I L E   S Y S T E M   S T A T U S --------
Device Number = 0
DEVICE INFO BLOCK: bootflash
 Magic Number          = 6887635   File System Vers = 10000   (1.0)
 Length                = 1000000   Sector Size      = 40000
 Programming Algorithm = 39        Erased State     = FFFFFFFF
 File System Offset    = 40000     Length = F40000
 MONLIB Offset         = 100       Length = C628
 Bad Sector Map Offset = 3FFF8     Length = 8
 Squeeze Log Offset    = F80000    Length = 40000
 Squeeze Buffer Offset = FC0000    Length = 40000
 Num Spare Sectors     = 0
 Spares:
STATUS INFO:
Writable
NO File Open for Write
Complete Stats
No Unrecovered Errors
No Squeeze in progress
USAGE INFO:
Bytes Used     = 917CE8  Bytes Available = 628318
Bad Sectors    = 0       Spared Sectors  = 0
OK Files       = 2       Bytes = 917BE8
Deleted Files  = 0       Bytes = 0
Files w/Errors = 0       Bytes = 0
Switch>


show slaveslot0:

To display information about the file system on the standby supervisor engine, use the `show slaveslot0:` command.

```
show slot0: [all | chips | filesys]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>(Optional) Displays all flash information including the output from the <code>show slot0:</code> <code>chips</code> and <code>show slot0: filesys</code> commands.</td>
</tr>
<tr>
<td>chips</td>
<td>(Optional) Displays flash chip register information.</td>
</tr>
<tr>
<td>filesys</td>
<td>(Optional) Displays file system status information.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display a summary of the file system:

```
Switch# show slaveslot0:
-# - ED --type-- --crc--- --seek-- nlen -length- -----date/time------ name
1   .. image    6375DBB7  A4F144    6 10678468 Nov 09 1999 10:50:42 halley

5705404 bytes available (10678596 bytes used)
Switch>
```

This example shows how to display flash chip information:

```
Switch# show slaveslot0: chips
******* Intel Series 2+ Status/Register Dump *********
ATTRIBUTE MEMORY REGISTERS:
   Config Option Reg (4000): 2
   Config Status Reg (4002): 0
   Card Status  Reg (4100): 1
   Write Protect Reg (4104): 4
   Voltage Cntrl Reg (410C): 0
   Rdy/Busy Mode Reg (4140): 2

COMMON MEMORY REGISTERS: Bank 0
   Intelligent ID Code : 8989A0A0
   Compatible Status Reg: 8080
   Global     Status Reg: B0B0
   Block Status Regs:
     0 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
     8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
    16 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
    24 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
```
COMMON MEMORY REGISTERS: Bank 1
Intelligent ID Code : 8989A0A0
Compatible Status Reg: 8080
Global Status Reg: B0B0
Block Status Regs:
0 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
16 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
24 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0

COMMON MEMORY REGISTERS: Bank 2
Intelligent ID Code : 8989A0A0
Compatible Status Reg: 8080
Global Status Reg: B0B0
Block Status Regs:
0 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
16 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
24 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0

COMMON MEMORY REGISTERS: Bank 3
Intelligent ID Code : 8989A0A0
Compatible Status Reg: 8080
Global Status Reg: B0B0
Block Status Regs:
0 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
16 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
24 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0

COMMON MEMORY REGISTERS: Bank 4
Intelligent ID Code : FFFFFFFF
IID Not Intel -- assuming bank not populated

This example shows how to display file system information:

Switch# show slaveslot0: filesys
-------- FILE SYSTEM STATUS --------
Device Number = 0
DEVI CE INFO BLOCK: slot0
  Magic Number = 6887635 File System Vers = 10000 (1.0)
  Length = 1000000 Sector Size = 20000
  Programming Algorithm = 4 Erased State = FFFFFFFF
  File System Offset = 20000 Length = FA0000
  MONLIB Offset = 100 Length = F568
  Bad Sector Map Offset = 1FFF0 Length = 10
  Squeeze Log Offset = FC0000 Length = 20000
  Squeeze Buffer Offset = FE0000 Length = 20000
  Num Spare Sectors = 0
  Spares:

STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  NO Unrecovered Errors
  No Squeeze in progress

USAGE INFO:
  Bytes Used = 9F365C Bytes Available = 5AC9A4
  Bad Sectors = 0 Spared Sectors = 0
  OK Files = 1 Bytes = 9F35DC
  Deleted Files = 0 Bytes = 0
  Files w/Errors = 0 Bytes =

Switch>
show slot0:

To display information about the slot0 file system, use the **show slot0:** command.

**show slot0:** [all | chips | filesys]

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>(Optional) Displays all flash information including the output from the <strong>show slot0:</strong> chips and <strong>show slot0:</strong> filesys commands.</td>
</tr>
<tr>
<td>chips</td>
<td>(Optional) Displays flash chip register information.</td>
</tr>
<tr>
<td>filesys</td>
<td>(Optional) Displays file system status information.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Examples

This example shows how to display a summary of the file system:

```bash
Switch# show slot0:
-# - ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
 1 .. image 6375DBB7 A4F144 6 10678468 Nov 09 1999 10:50:42 halley

5705404 bytes available (10678596 bytes used)
Switch>
```

This example shows how to display flash chip information:

```bash
Switch# show slot0: chips
******** Intel Series 2+ Status/Register Dump ********
ATTRIBUTE MEMORY REGISTERS:
  Config Option Reg (4000): 2
  Config Status Reg (4002): 0
  Card Status Reg (4100): 1
  Write Protect Reg (4104): 4
  Voltage Cntrl Reg (410C): 0
  Rdy/Busy Mode Reg (4140): 2

COMMON MEMORY REGISTERS: Bank 0
  Intelligent ID Code : 8989A0A0
  Compatible Status Reg: 8080
  Global Status Reg: B0B0
  Block Status Regs:
    0 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
    8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
   16 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
   24 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
```
show slot0:

This example shows how to display file system information:

Switch# show slot0: filess
-------- FILE SYSTEM STATUS --------
Device Number = 0
DEVICE INFO BLOCK: slot0
Magic Number = 6887635 File System Vers = 10000 (1.0)
Length = 1000000 Sector Size = 20000
Programming Algorithm = 4 Erased State = FFFFFFFF
File System Offset = 20000 Length = FA0000
MONLIB Offset = 100 Length = F568
Bad Sector Map Offset = 1FFF0 Length = 10
Squeeze Log Offset = FC0000 Length = 20000
Squeeze Buffer Offset = FE0000 Length = 20000
Num Spare Sectors = 0
Spares:
STATUS INFO:
Writable
NO File Open for Write
Complete Stats
No Unrecovered Errors
No Squeeze in progress
USAGE INFO:
Bytes Used = 9F365C Bytes Available = 5AC9A4
Bad Sectors = 0 Spared Sectors = 0
OK Files = 1 Bytes = 9F35DC
Deleted Files = 0 Bytes = 0
Files w/Errors = 0 Bytes = 0
Switch>
show spanning-tree

To display spanning-tree state information, use the show spanning-tree command.

```
show spanning-tree [bridge_group | active | backbonefast | bridge [id] | inconsistentports |
  interface type | root | summary [total] | uplinkfast | vlan vlan_id | pathcost method | detail]
```

### Syntax Description

- **bridge_group** (Optional) Specifies the bridge group number; valid values are from 1 to 255.
- **active** (Optional) Displays the spanning-tree information on active interfaces only.
- **backbonefast** (Optional) Displays the spanning-tree BackboneFast status.
- **bridge** (Optional) Displays the bridge status and configuration information.
- **id** (Optional) Name of the bridge.
- **inconsistentports** (Optional) Displays the root inconsistency state.
- **interface type** (Optional) Specifies the interface type and number; valid values are `fastethernet`, `gigabitethernet`, `tengigabitethernet`, `port-channel` (1 to 64), and `vlan` (1 to 4094).
- **root** (Optional) Displays the root bridge status and configuration.
- **summary** (Optional) Specifies a summary of port states.
- **total** (Optional) Displays the total lines of the spanning-tree state section.
- **uplinkfast** (Optional) Displays the spanning-tree UplinkFast status.
- **vlan vlan_id** (Optional) Specifies the VLAN ID; valid values are from 1 to 4094.
- **pathcost method** (Optional) Displays the default path cost calculation method used.
- **detail** (Optional) Displays a summary of interface information.

### Defaults

Interface information summary is displayed.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Support for extended addressing was added.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>
Examples

This example shows how to display spanning-tree information on the active interfaces only:

Switch# show spanning-tree active
UplinkFast is disabled
BackboneFast is disabled

VLAN1 is executing the ieee compatible Spanning Tree protocol
Bridge Identifier has priority 32768, address 0050.3e8d.6401
Configured hello time 2, max age 20, forward delay 15
Current root has priority 16384, address 0060.704c.7000
Root port is 265 (FastEthernet5/9), cost of root path is 38
Topology change flag not set, detected flag not set
Number of topology changes 0 last change occurred 18:13:54 ago
Times: hold 1, topology change 24, notification 2
hello 2, max age 14, forward delay 10
Timers: hello 0, topology change 0, notification 0

Port 265 (FastEthernet5/9) of VLAN1 is forwarding
Port path cost 19, Port priority 128, Port Identifier 128.9.
Designated root has priority 16384, address 0060.704c.7000
Designated bridge has priority 32768, address 00e0.4fac.b000
Designated port id is 128.2, designated path cost 19
Timers: message age 3, forward delay 0, hold 0
Number of transitions to forwarding state: 1
BPDU: sent 3, received 32852

Switch#

This example shows how to display the spanning-tree BackboneFast status:

Switch# show spanning-tree backbonefast
BackboneFast is enabled

BackboneFast statistics
-----------------------
Number of transition via backboneFast (all VLANs) : 0
Number of inferior BPDU 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

Switch#

This example shows how to display spanning-tree information for the bridge:

Switch# show spanning-tree bridge
VLAN1
Bridge ID  Priority  32768
Address 0050.3e8d.6401
Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
VLAN2
Bridge ID  Priority  32768
Address 0050.3e8d.6402
Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
VLAN3
Bridge ID  Priority  32768
Address 0050.3e8d.6403
Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

Switch#

This example shows how to display a summary of interface information:

Switch# show spanning-tree
VLAN1
show spanning-tree

Spanning tree enabled protocol ieee
Root ID  Priority  32768
        Address  0030.94fc.0a00
This bridge is the root
Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

Bridge ID  Priority  32768
        Address  0030.94fc.0a00
Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
Aging Time 300

Interface Name                 Port ID Prio  Cost   Sts  Cost              Bridge ID          Port ID
-------------------    ------- --- ------ ---   ---- -------------------- -------
FastEthernet6/15     129.79  128     19 FWD      0 32768 0030.94fc.0a00 129.79

VLAN2
Spanning tree enabled protocol ieee
Root ID  Priority  32768
        Address  0030.94fc.0a01
This bridge is the root
Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

Interface Name                 Port ID Prio  Cost   Sts  Cost              Bridge ID          Port ID
-------------------    ------- --- ------ ---   ---- -------------------- -------
FastEthernet6/16     129.80  128     19 FWD      0 32768 0030.94fc.0a01 129.80

This example shows how to display spanning-tree information for Fast Ethernet interface 5/9:

Switch# show spanning-tree interface fastethernet5/9
Interface Fa0/10 (port 23) in Spanning tree 1 is ROOT-INCONSISTENT
Port path cost 100, Port priority 128
Designated root has priority 8192, address 0090.0c71.a400
Designated bridge has priority 32768, address 00e0.1e9f.8940
Designated port is 23, path cost 115
Timers: message age 0, forward delay 0, hold 0
BPDU: sent 0, received 0
The port is in the portfast mode
Switch#

This example shows how to display spanning-tree information for a specific VLAN:

Switch# show spanning-tree vlan 1
VLAN1 is executing the ieee compatible Spanning Tree protocol
Bridge Identifier has priority 32768, address 0030.94fc.0a00
Configured hello time 2, max age 20, forward delay 15
We are the root of the spanning tree
Topology change flag not set, detected flag not set
Number of topology changes 5 last change occurred 01:50:47 ago
from FastEthernet6/16
Times: hold 1, topology change 35, notification 2
hello 2, max age 20, forward delay 15

Timers:hello 0, topology change 0, notification 0, aging 300
Port 335 (FastEthernet6/15) of VLAN1 is forwarding
Port path cost 19, Port priority 128, Port Identifier 129.79.
Designated root has priority 32768, address 0030.94fc.0a00
Designated bridge has priority 32768, address 0030.94fc.0a00
Designated port id is 129.79, designated path cost 0
Timers: message age 0, forward delay 0, hold 0
Number of transitions to forwarding state: 1
BPDU: sent 6127, received 0
Switch#

This example shows how to display spanning-tree information for a specific bridge group:

Switch# show spanning-tree vlan 1
UplinkFast is disabled
BackboneFast is disabled
Switch#

This example shows how to display a summary of port states:

Switch# show spanning-tree summary
Root bridge for: VLAN1, VLAN2.
PortFast BPDU Guard is disabled
EtherChannel misconfiguration guard is enabled
UplinkFast is disabled
BackboneFast is disabled
Default pathcost method used is short

<table>
<thead>
<tr>
<th>Name</th>
<th>Blocking</th>
<th>Listening</th>
<th>Learning</th>
<th>Forwarding</th>
<th>STP Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLAN1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>VLAN2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to display the total lines of the spanning-tree state section:

Switch# show spanning-tree summary totals
Root bridge for: VLAN1, VLAN2.
PortFast BPDU Guard is disabled
EtherChannel misconfiguration guard is enabled
UplinkFast is disabled
BackboneFast is disabled
Default pathcost method used is short

<table>
<thead>
<tr>
<th>Name</th>
<th>Blocking</th>
<th>Listening</th>
<th>Learning</th>
<th>Forwarding</th>
<th>STP Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLAN1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>VLAN2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Switch#

This example shows how to determine whether any ports are in root inconsistent state:

Switch# show spanning-tree inconsistentports

<table>
<thead>
<tr>
<th>Name</th>
<th>Interface</th>
<th>Inconsistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLAN1</td>
<td>FastEthernet3/1</td>
<td>Root Inconsistent</td>
</tr>
</tbody>
</table>

Number of inconsistent ports (segments) in the system: 1
Switch#

Related Commands
### Command Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>spanning-tree backbonefast</code></td>
<td>Enables BackboneFast on a spanning-tree VLAN.</td>
</tr>
<tr>
<td><code>spanning-tree cost</code></td>
<td>Calculates the path cost of STP on an interface.</td>
</tr>
<tr>
<td><code>spanning-tree guard</code></td>
<td>Enables root guard.</td>
</tr>
<tr>
<td><code>spanning-tree pathcost method</code></td>
<td>Sets the path cost calculation method.</td>
</tr>
<tr>
<td><code>spanning-tree portfast default</code></td>
<td>Enables PortFast by default on all access ports.</td>
</tr>
<tr>
<td><code>spanning-tree portfast (interface configuration mode)</code></td>
<td>Enables PortFast mode.</td>
</tr>
<tr>
<td><code>spanning-tree port-priority</code></td>
<td>Prioritizes an interface when two bridges compete for position as the root bridge.</td>
</tr>
<tr>
<td><code>spanning-tree uplinkfast</code></td>
<td>Enables the UplinkFast feature.</td>
</tr>
<tr>
<td><code>spanning-tree vlan</code></td>
<td>Configures STP on a per-VLAN basis.</td>
</tr>
</tbody>
</table>
### show spanning-tree mst

To display MST protocol information, use the `show spanning-tree mst` command.

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

#### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configuration</td>
<td>(Optional) Displays region configuration information.</td>
</tr>
<tr>
<td>instance-id</td>
<td>(Optional) Instance identification number; valid values are from 0 to 15.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Displays detailed MST protocol information.</td>
</tr>
<tr>
<td>interface</td>
<td>(Optional) Interface type and number; valid values for type are <code>fastethernet</code>, <code>gigabitethernet</code>, <code>tengigabitethernet</code>, <code>port-channel</code>, and <code>vlan</code>. See the “Usage Guidelines” section for more information.</td>
</tr>
</tbody>
</table>

#### Defaults

This command has no default settings.

#### Command Modes

Privileged EXEC mode

#### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(12c)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
</tbody>
</table>

#### Usage Guidelines

This command is not supported on systems that are configured with a Supervisor Engine I.

In the output display of the `show spanning-tree mst configuration` command, a warning message might display. This message appears if you do not map secondary VLANs to the same instance as the associated primary VLAN. The display includes a list of the secondary VLANs that are not mapped to the same instance as the associated primary VLAN. The warning message is as follows:

```
These secondary vlans are not mapped to the same instance as their primary:
-> 3
```

See the `show spanning-tree` command for output definitions.
Examples

This example shows how to display region configuration information:

Switch# show spanning-tree mst configuration
Name    [leo]
Revision 2702
Instance Vlans mapped
-------- ---------------------------------------------------------------------
 0        1-9,11-19,21-29,31-39,41-4094
 1        10,20,30,40
---------------------------------------------------------------------
Switch#

This example shows how to display additional MST protocol values:

Switch# show spanning-tree mst 3 detail
# # # # # MST03 vlans mapped: 3,3000-3999
Bridge address 0002.172c.f400 priority 32771 (32768 sysid 3)
Root this switch for MST03
GigabitEthernet1/1 of MST03 is boundary forwarding
Port info port id 128.1 priority 128
cost 20000
Designated root address 0002.172c.f400 priority 32771
cost 0
Designated bridge address 0002.172c.f400 priority 32771 port id 128.1
Timers: message expires in 0 sec, forward delay 0, forward transitions 1
Bpdus (MRecords) sent 4, received 0
FastEthernet4/2 of MST03 is backup blocking
Port info port id 128.194 priority 128
cost 200000
Designated root address 0002.172c.f400 priority 32771
cost 0
Designated bridge address 0002.172c.f400 priority 32771 port id 128.193
Timers: message expires in 2 sec, forward delay 0, forward transitions 1
Bpdus (MRecords) sent 3, received 252
Switch#

This example shows how to display MST information for a specific interface:

Switch# show spanning-tree mst 0 interface fastethernet4/1 detail
Edge port: no (trunk) port guard : none (default)
Link type: point-to-point (point-to-point) bpdu filter: disable (default)
Boundary : internal bpdu guard : disable (default)
FastEthernet4/1 of MST00 is designated forwarding
Vlans mapped to MST00 1-2,4-2999,4000-4094
Port info port id 128.193 priority 128
cost 200000
Designated root address 0050.3e66.d000 priority 8193
cost 20004
Designated ist master address 0002.172c.f400 priority 49152
cost 0
Designated bridge address 0002.172c.f400 priority 49152 port id 128.193
Timers: message expires in 0 sec, forward delay 0, forward transitions 1
Bpdus sent 492, received 3
Switch#
<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>spanning-tree mst</td>
<td>Sets the path cost and port-priority parameters for any MST instance.</td>
</tr>
<tr>
<td></td>
<td>spanning-tree mst forward-time</td>
<td>Sets the forward delay timer for all the instances.</td>
</tr>
<tr>
<td></td>
<td>spanning-tree mst hello-time</td>
<td>Sets the hello-time delay timer for all the instances.</td>
</tr>
<tr>
<td></td>
<td>spanning-tree mst max-hops</td>
<td>Specifies the number of possible hops in the region before a BPDU is discarded.</td>
</tr>
<tr>
<td></td>
<td>spanning-tree mst root</td>
<td>Designates the primary root.</td>
</tr>
</tbody>
</table>
show storm-control

To display the broadcast storm control settings on the switch or on the specified interface, use the show storm-control command.

```bash
show storm-control [interface-id | broadcast]
```

**Supervisor Engine 6-E and Catalyst 4900M chassis**

```bash
show storm-control [interface-id | broadcast | multicast]
```

**Syntax Description**

- `interface-id` (Optional): Specifies the interface ID for the physical port.
- `broadcast` (Optional): Displays the broadcast storm threshold setting.
- `multicast` (Optional): Displays the multicast storm threshold setting.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
<tr>
<td>12.2(40)SG</td>
<td>Added support for the Supervisor Engine 6-E and Catalyst 4900M chassis.</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, the settings are displayed for the broadcast traffic type for all ports on the switch.

**Examples**

This is an example of output from the `show storm-control` command when no keywords are entered. Because no traffic type keyword was entered, the broadcast storm control settings are displayed.

```bash
Switch# show storm-control
Interface Filter State Upper Lower Current
--------- ------------- ------- ------- -------
Gi2/1 Forwarding 30.00% 30.00% N/A
Gi4/1 Forwarding 30.00% 30.00% N/A
Gi4/3 Forwarding 30.00% 30.00% N/A
Switch#
```
This is an example of output from the `show storm-control multicast` command on a Supervisor Engine 6-E:

```
Switch# show storm-control multicast //Supervisor Engine 6-E
Interface Filter State Broadcast Multicast Level
--------- ------------- --------- --------- -----  
Fa6/2  Blocking Enabled Enabled 61%  
```

This is an example of output from the `show storm-control` command on a Supervisor Engine 6-E when no keywords are entered:

```
Switch# show storm-control
Interface Filter State Broadcast Multicast Level
--------- ------------- --------- --------- ----- 
Fa6/2  Blocking Enabled Enabled 61%  
```

This is an example of output from the `show storm-control` command for a specified interface:

```
Switch# show storm-control fastethernet2/17
Interface Filter State Level Current
--------- ------------- ------- -------  
Fa2/17 Forwarding 50.00% 0.00%  
```

This is an example of output from the `show storm-control` command for a specified interface on a Supervisor Engine 6-E:

```
Switch# show storm-control interface fastethernet6/1
Interface Filter State Broadcast Multicast Level
--------- ------------- --------- ------- -----  
Fa6/1  Blocking Enabled Disabled 81%  
```

Table 2-40 describes the fields in the `show storm-control` display.

<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>Level</td>
<td>Displays the threshold level set on the interface for broadcast traffic.</td>
</tr>
<tr>
<td>Current</td>
<td>Displays the bandwidth utilization of broadcast traffic as a percentage of</td>
</tr>
<tr>
<td></td>
<td>total available bandwidth. This field is valid only when storm control is</td>
</tr>
<tr>
<td></td>
<td>enabled.</td>
</tr>
</tbody>
</table>

Note: N/A is displayed for interfaces that do storm control in the hardware.
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>storm-control</code></td>
<td>Enables broadcast storm control on a port and specifies what to do when a storm occurs on a port.</td>
</tr>
<tr>
<td><code>show interfaces counters</code></td>
<td>Displays the traffic on the physical interface.</td>
</tr>
<tr>
<td><code>show running-config</code></td>
<td>Displays the running configuration of a switch.</td>
</tr>
</tbody>
</table>
show switch virtual (virtual switch)

To display configuration and status information for a virtual switching system (VSS), use the show switch virtual command in EXEC mode.

```
show switch virtual [dual-active {bfd | pagp | summary} | link [counters | detail | port-channel | ports] | redundancy | role | slot-map]
```

**Syntax Description**

- `detail` (Optional) Displays detailed virtual switch information.
- `detail-active` (Optional) Displays virtual switch dual-active information.
- `bridge` (Optional) Displays the bridge status and configuration information.
- `pagp` Specifies a summary of dual-active PAgP information.
- `summary` Specifies a summary of dual-active configuration information.
- `link` (Optional) Displays the virtual switch link information.
- `counters` (Optional) Displays VSL counter information.
- `port-channel` (Optional) Displays VSL port channel information.
- `ports` (Optional) Displays VSL port information.
- `redundancy` (Optional) Displays the VSS redundancy status.
- `role` (Optional) Displays the VSS role information.
- `slot-map` (Optional) Displays the VSS slot map table.

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS XE 3.4.0SG and 15.1(2)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command to display configuration and status information for a VSS.

The `show switch virtual link detail` command displays the output of the `show switch virtual link` commands and the `show vslp lmp internal` commands. In the output, the entry "show int" is displayed for all the VSL members.

The `show switch virtual dual-active pagp` command displays dual-active trust mode status.
The following example shows how to display configuration and status information for the VSS:

- In virtual switch mode without skipping config-register:

  Router# `show switch virtual`
  Switch mode : Virtual Switch
  Virtual switch domain number : 1
  Local switch number : 2
  Local switch operational role: Virtual Switch Active
  Peer switch number : 1
  Peer switch operational role : Virtual Switch Standby
  Router#

- In virtual switch mode with skipping config-register but not yet rebooted:

  Router# `show switch virtual`
  Switch mode : Virtual Switch
  Virtual switch domain number : 1
  Local switch number : 2
  Local switch operational role: Virtual Switch Active
  Peer switch number : 1
  Peer switch operational role : Virtual Switch Standby
  Warning: Config-register set or will be set to skip configuration 0x2142 in the next reload.
  Change config-register; otherwise, switch will be boot in Standalone mode with some default config.
  Router#

- In standalone mode without skipping config-register:

  Router# `show switch virtual`
  Switch Mode : Standalone
  Not in Virtual Switch mode due to:
  Domain ID is not configured
  Router#

- In standalone mode with skipping config-register:

  Router# `show switch virtual`
  Switch Mode : Standalone
  Not in Virtual Switch mode due to:
  Domain ID is not configured
  Warning: config-register is set to skip parse 0x2142 in RP or SP
  Use [show boot] on RP/SP to verify.
  Router#

The following example shows how to display the virtual switch link information:

Router# `show switch virtual link`
VSL Status             : UP
VSL Uptime             : 4 hours, 26 minutes
VSL SCP Ping           : Pass (or Fail) OK (or Not OK)
VSL ICC (Ping)         : Pass (or Fail)
VSL Control Link       : Te1/3/1
Router#

The following example shows how to display the virtual switch link counter information:

Router# `show switch virtual link counters`
Port       InOctets   InUcastPkts   InMcastPkts   InBcastPkts
Po10       66340451   190415       15637        112069
Tel1/3/1    66981250   194528       15770        112072
Po20        42116619   92926        16406        128593
Tel2/2/1    42117401   92932        16406        128593
Port       OutOctets  OutUcastPkts  OutMcastPkts  OutBcastPkts

The following example shows how to display the virtual switch link port-channel information:

```
Router# show switch virtual link port-channel
VSL Port Channel Information
Flags:  D - down        P - bundled in port-channel
       I - stand-alone  s - suspended
       H - Hot-standby (LACP only)
       R - Layer3      S - Layer2
       U - in use      N - not in use, no aggregation
       f - failed to allocate aggregator
       M - not in use, no aggregation due to minimum links not met
       m - not in use, port not aggregated due to minimum links not met
       u - unsuitable for bundling
       w - waiting to be aggregated

Router#
```

This example shows how to display information for BFD dual-active detection:

```
Router# show switch virtual dual-active bfd
Bfd dual-active detection enabled: Yes
Bfd dual-active interface pairs configured:
   interface1 Gi1/9/48 interface2 Gi2/1/48

Group  Port-channel  Protocol  Ports
   +---------------------------------------------+
   10    Po10(RU)         -        Te1/3/1(P)
   20    Po20(RU)         -        Te2/2/1(P)

Router#
```

The following example shows how to display the virtual switch link port information:

```
Router# show switch virtual link port
VSL Link Info : Configured: 3   Operational: 1
Peer         Peer         Peer
Interface   State         MAC          Switch  Interface
-----------------------------------------------------------------------
Gi1/3/1     link_down     -               -     -
Gi1/5/4     operational   0013.5fcb.1480  2    Gi1/6/4
Gi1/5/5     link_down     -               -     -

Last operational         Current packet       Last Diag   Time since
Interface   Failure state            State                Result      Last Diag
-------------------------------------------------------------------------------
Gi1/1/1     No failure               Hello bidir            Never ran   7M:51S
Gi1/1/2     No failure               No failure             Never ran   7M:51S

Hello Tx (T4) ms        Hello Rx (T5*) ms
Interface  State        Cfg     Cur     Rem     Cfg     Cur     Rem
-------------------------------
Te1/1/1    operational  500     500     404     5000    5000    4916
Te1/1/2    link_down    500     -       -       500000  -       -
Te1/3/3    link_down    500     -       -       500000  -       -
Te1/3/4    operational  500     500     404     500000  500000  499916

*T5 = min_rx * multiplier

Router#
```
The following example shows how to display redundancy status information for each switch in the virtual switch:

```
Router# show switch virtual redundancy
My Switch Id = 1
Peer Switch Id = 2
Last switchover reason = user forced
Configured Redundancy Mode = sso
Operating Redundancy Mode = sso
Switch 1 Slot 5 Processor Information :
-----------------------------------------------
Current Software state = ACTIVE
Uptime in current state = 9 hours, 32 minutes
Image Version = Cisco IOS Software, s72033_rp Software (s72033_rp-ADVENTERPRISEK9_WAN_DBG-VM), Version 12.2(SIERRA_INTEG_090405) INTERIM SOFTWARE
Synced to V122_32_8_11, 12.2(32.8.11)SR on rainier, Weekly 12.2(32.8.11)SX261
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2009 by Cisco Systems, Inc.
Compiled Mon 06-Apr-09 02:54 by kchristi
BOOT = disk0:mz_good_image,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = ACTIVE
Control Plane State = ACTIVE
Switch 1 Slot 6 Processor Information :
-----------------------------------------------
Current Software state = RPR-Warm
Uptime in current state = 4 days, 17 hours, 36 minutes
Image Version =
BOOT = disk0:mz-rbh,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = RPR-Warm
Control Plane State = RPR-Warm
Switch 2 Slot 5 Processor Information :
-----------------------------------------------
Current Software state = STANDBY HOT (switchover target)
Uptime in current state = 9 hours, 24 minutes
Image Version = Cisco IOS Software, s72033_rp Software (s72033_rp-ADVENTERPRISEK9_WAN_DBG-VM), Version 12.2(SIERRA_INTEG_090405) INTERIM SOFTWARE
Synced to V122_32_8_11, 12.2(32.8.11)SR on rainier, Weekly 12.2(32.8.11)SX261
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2009 by Cisco Systems, Inc.
Compiled Mon 06-Apr-09 02:54 by kchristi
BOOT = disk0:mz_good_image,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = ACTIVE
Control Plane State = STANDBY
Switch 2 Slot 6 Processor Information :
-----------------------------------------------
Current Software state = RPR-Warm
Uptime in current state = 4 days, 17 hours, 36 minutes
Image Version =
BOOT = disk0:mz-rbh,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = RPR-Warm
Control Plane State = RPR-Warm
Router#
```
The following example shows how to display role and configuration and status information for each switch in the virtual switch:

```
Router# show switch virtual role
Switch  Switch  Status  Preempt  Priority  Role  Session ID
Number    Number          Local  Remote
--------------------------------------------------------------------
Local     1     UP      TRUE     200      ACTIVE    0     0
Remote    2     UP      FALSE    100      STANDBY  9272  271
In dual-active recovery mode: No
Valid flag can be moved to detail SID
Router#
```

The following example shows how to display the virtual switch slot map table:

```
Router# show switch virtual slot-map
Virtual Slot to Remote Switch/Physical Slot Mapping Table:
Slot No  Switch No  Slot No  Uptime
---------+-----------+----------+----------
17          1        1        03:04:51
18          1        2        03:04:50
19          1        3        03:00:25
20          1        4        03:04:53
21          1        5        03:04:59
22          1        0          -
23          1        0          -
24          1        0          -
25          1        0          -
26          1        0          -
27          1        0          -
28          1        0          -
29          1        0          -
30          1        0          -
31          1        0          -
32          1        0          -
33          2        1        02:59:25
34          2        2        02:59:23
35          2        3        02:59:23
36          2        4        02:59:27
37          2        5        03:03:17
38          1        0          -
39          1        0          -
40          1        0          -
41          1        0          -
42          1        0          -
43          1        0          -
44          1        0          -
45          1        0          -
46          1        0          -
47          1        0          -
48          1        0          -
49          1        0          -
Router#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dual-active detection (virtual switch)</td>
<td>Enables and configures dual-active detection.</td>
</tr>
<tr>
<td>switch (virtual switch)</td>
<td>Configures the VSS domain number and enter the virtual switch domain configuration submode.</td>
</tr>
</tbody>
</table>
**show system mtu**

To display the global MTU setting, use the `show system mtu` command.

```
show system mtu
```

### Syntax Description

This command has no arguments or keywords.

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(12c)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Examples

This example shows how to display the global MTU setting:

```
Switch# show system mtu
Global Ethernet MTU is 1550 bytes.
Switch#
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>system mtu</code></td>
<td>Sets the maximum Layer 2 or Layer 3 payload size.</td>
</tr>
</tbody>
</table>
show tech-support

To display troubleshooting information for TAC, use the show tech-support command.

```
show tech-support [bridging | cef | ipmulticast | isis | password [page] | page]
```

### Syntax Description

- **bridging** *(Optional)* Specifies bridging-related information.
- **CEF** *(Optional)* Specifies CEF-related information.
- **ipmulticast** *(Optional)* Specifies IP multicast-related information.
- **isis** *(Optional)* Specifies CLNS and ISIS-related information.
- **password** *(Optional)* Includes passwords and other security information in the output.
- **page** *(Optional)* Displays one page of information at a time in the output.

### Defaults

The defaults are as follows:

- Outputs are displayed without page breaks.
- Passwords and other security information are removed from the output.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

Output from the `show tech-support` command may be terminated in midstream with the key combination Ctrl+Alt+6. The command output is buffered so that the command terminates when output of the current subcommand running under this command completes.

Press the **Return** key to display the next line of output, or press the **Space** bar to display the next page of information. If you do not enter the `page` keyword, the output scrolls. It does not stop for page breaks.

If you enter the `password` keyword, password encryption is enabled, but only the encrypted form appears in the output.

If you do not enter the `password` keyword, the passwords and other security-sensitive information in the output are replaced in the output with the word “removed.”

The `show tech-support` commands are a compilation of several `show` commands and the output can be quite lengthy. For a sample display of the output of the `show tech-support` command, see the individual `show` command listed.

If you enter the `show tech-support` command without arguments, the output displays the equivalent of these `show` commands:

- `show version`
- `show running-config`
- `show stacks`
- show interfaces
- show controllers
- show process memory
- show process cpu
- show buffers
- show logging
- show module
- show power
- show environment
- show interfaces switchport
- show interfaces trunk
- show vlan

If you enter the ipmulticast keyword, the output displays the equivalent of these show commands:
- show ip pim interface
- show ip pim interface count
- show ip pim neighbor
- show ip pim rp
- show ip igmp groups
- show ip igmp interface
- show ip mroute count
- show ip mroute
- show ip mcache
- show ip dvmrp route

**Examples**

For a sample display of the show tech-support command output, see the commands listed in the “Usage Guidelines” section for more information.

**Related Commands**

See the “Usage Guidelines ” section.
show udld

To display the administrative and operational UDLD status, use the `show udld` privileged EXEC command.

```
show udld interface-id | neighbors | fast-hello {interface id}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface id</td>
<td>Specifies the administrative and operational UDLD status for a specific interface.</td>
</tr>
<tr>
<td>neighbors</td>
<td>Specifies the UDLD neighbor summary.</td>
</tr>
<tr>
<td>fast-hello</td>
<td>Specifies Fast UDLD neighbor summary and interface specific status.</td>
</tr>
<tr>
<td>interface-id</td>
<td>Specifies the name of the interface.</td>
</tr>
</tbody>
</table>

**Defaults**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.2(25)EW</td>
<td>Added support for the 10-Gigabit Ethernet interface.</td>
</tr>
<tr>
<td>12.2(54)SG</td>
<td>Added support for <code>show udld fast-hello</code> and <code>show udld fast-hello interface-id</code>.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If you do not enter an `interface_id` value, the administrative and operational UDLD status for all interfaces is displayed.

**Examples**

To verify status for a particular link as reported by UDLD, enter the following command:

```
Switch# show udld g1/34
Interface G1/34
---
Port enable administrative configuration setting: Enabled / in aggressive mode
Port enable operational state: Enabled / in aggressive mode
Current bidirectional state: Bidirectional
Current operational state: Advertisement - Single neighbor detected
Message interval: 15000 ms
Time out interval: 5000 ms
---
Port fast-hello configuration setting: Disabled
Port fast-hello interval: 0 ms
Port fast-hello operational state: Disabled
Neighbor fast-hello configuration setting: Disabled
Neighbor fast-hello interval: Unknown
---
Entry 1
---
```

To display the administrative and operational UDLD status, use the `show udld` privileged EXEC command.
To verify link status as reported by UDLD, enter the following command:

```
Switch# show udld neighbors
```

<table>
<thead>
<tr>
<th>Port</th>
<th>Device Name</th>
<th>Device ID</th>
<th>Port ID</th>
<th>Neighbor State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/33</td>
<td>FOX10430380</td>
<td>1</td>
<td>Gi1/33</td>
<td>Bidirectional</td>
</tr>
<tr>
<td>Gi1/34</td>
<td>FOX10430380</td>
<td>1</td>
<td>Gi1/34</td>
<td>Bidirectional</td>
</tr>
</tbody>
</table>

To verify Fast UDLD configuration, enter the following command:

```
Switch# show udld fast-hello
```

Total ports on which fast hello can be configured: 16  
Total ports with fast hello configured: 3  
Total ports with fast hello operational: 3  
Total ports with fast hello non-operational: 0

<table>
<thead>
<tr>
<th>Port-ID</th>
<th>Hello Neighbor</th>
<th>Device Neighbor</th>
<th>Port</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/45</td>
<td>200</td>
<td>FOX104303NL</td>
<td>Gi1/45</td>
<td>Operational</td>
</tr>
<tr>
<td>Gi1/46</td>
<td>200</td>
<td>FOX104303NL</td>
<td>Gi1/46</td>
<td>Operational</td>
</tr>
<tr>
<td>Gi1/47</td>
<td>200</td>
<td>FOX104303NL</td>
<td>Gi1/47</td>
<td>Operational</td>
</tr>
</tbody>
</table>

To verify status for a particular link as reported by Fast UDLD, enter the following command:

```
Switch# show udld fast-hello gi1/33
```

Interface Gi1/33

---

Port enable administrative configuration setting: Enabled / in aggressive mode  
Port enable operational state: Enabled / in aggressive mode  
Current bidirectional state: Bidirectional  
Current operational state: Advertisement - Single neighbor detected  
Message interval: 200 ms  
Time out interval: 5000 ms

Port fast-hello configuration setting: Enabled  
Port fast-hello interval: 200 ms  
Port fast-hello operational state: Enabled  
Neighbor fast-hello configuration setting: Enabled  
Neighbor fast-hello interval: 200 ms

Entry 1

---

Expiration time: 500 ms  
Cache Device index: 1  
Current neighbor state: Bidirectional  
Device ID: FOX10430380  
Port ID: Gi1/33  
Neighbor echo 1 device: FOX104303NL  
Neighbor echo 1 port: Gi1/33
show udld

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>udld (global configuration mode)</td>
<td>Enables aggressive or normal mode in the UDLD protocol and sets the configurable message timer time.</td>
</tr>
<tr>
<td>udld (interface configuration mode)</td>
<td>Enables UDLD on an individual interface or prevents a fiber interface from being enabled by the udld (global configuration mode) command.</td>
</tr>
</tbody>
</table>

TLV Message interval: 15
TLV fast-hello interval: 200 ms
TLV Time out interval: 5
TLV CDP Device name: Switch
show vlan

To display VLAN information, use the show vlan command.

```
show vlan [brief | id vlan_id | name name]
```

```
show vlan private-vlan [type]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>brief</td>
<td>(Optional) Displays only a single line for each VLAN, naming the VLAN, status, and ports.</td>
</tr>
<tr>
<td>id vlan_id</td>
<td>(Optional) Displays information about a single VLAN identified by VLAN ID number; valid values are from 1 to 4094.</td>
</tr>
<tr>
<td>name name</td>
<td>(Optional) Displays information about a single VLAN identified by VLAN name; valid values are an ASCII string from 1 to 32 characters.</td>
</tr>
<tr>
<td>private-vlan</td>
<td>Displays private VLAN information.</td>
</tr>
<tr>
<td>type</td>
<td>(Optional) Private VLAN type.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
<tr>
<td>12.1(12c)EW</td>
<td>Added support for extended VLAN addresses.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the VLAN parameters for all VLANs within the administrative domain:

```
Switch# show vlan
VLAN   Name         Status    Ports
-----  ------------  ---------  -------------------------------
  1     default      active    Fa5/9
  2     VLAN0002     active    Fa5/9
  3     VLAN0003     active    Fa5/9
  4     VLAN0004     active    Fa5/9
  5     VLAN0005     active    Fa5/9
  6     VLAN0006     active    Fa5/9
  10    VLAN0010     active    Fa5/9
  20    VLAN0020     active    Fa5/9
<...Output truncated...>
```
This example shows how to display the VLAN name, status, and associated ports only:

```
Switch# show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
 1    default                          active    Fa5/9
 2    VLAN0002                         active    Fa5/9
 3    VLAN0003                         active    Fa5/9
 4    VLAN0004                         active    Fa5/9
 5    VLAN0005                         active    Fa5/9
 6    VLAN0010                         active    Fa5/9
...
999  VLAN0999                         active    Fa5/9
1002 fddi-default                     active    Fa5/9
1003 trcrf-default                    active    Fa5/9
1004 fddinet-default                  active    Fa5/9
1005 trbrf-default                    active    Fa5/9
Switch#
```
This example shows how to display the VLAN parameters for VLAN 3 only:

Switch# show vlan id 3

<table>
<thead>
<tr>
<th>VLAN Name</th>
<th>Status</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLAN0003</td>
<td>active</td>
<td>Fa5/9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VLAN 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>enet</td>
<td>100003</td>
<td>1500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>303</td>
<td>0</td>
</tr>
</tbody>
</table>

Switch#

Table 2-41 describes the fields in the `show vlan` command output.

### Table 2-41  `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 Identifier 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>
</tbody>
</table>

The following example shows how to verify that the primary VLAN and secondary VLANs are correctly associated with each other and the same association also exists on the PVLAN port:

Switch# show vlan private-vlan

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Type</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>100</td>
<td>community</td>
<td>Fa3/1, Fa3/2</td>
</tr>
</tbody>
</table>

The following example shows how to remove the VLAN association:

Switch(config)# vlan 10
Switch(config-vlan)# private-vlan association remove 100
Switch(config-vlan)# end
Switch# show vlan private

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Type</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>100</td>
<td>primary</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Type</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>100</td>
<td>community</td>
<td></td>
</tr>
</tbody>
</table>
This example shows how to verify PVLAN configuration on the interface:

```
Switch# show interface f3/2 status
Port    Name       Status      Vlan       Duplex  Speed Type
Fa3/2                          connected  pvlan sec a-full  a-100 10/100BaseTX

Switch# show interface f3/1 status
Port    Name       Status      Vlan       Duplex  Speed Type
Fa3/1                          connected  pvlan prom a-full  a-100 10/100BaseTX
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vlan (VLAN Database mode)</td>
<td>Configures a specific VLAN.</td>
</tr>
<tr>
<td>vlan database</td>
<td>Enters VLAN configuration mode.</td>
</tr>
<tr>
<td>vtp (global configuration mode)</td>
<td>Modifies the name of a VTP configuration storage file.</td>
</tr>
</tbody>
</table>
**show vlan access-map**

To display the contents of a VLAN access map, use the `show vlan access-map` command.

```
show vlan access-map [map-name]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>map-name</code></td>
<td>(Optional) Name of the VLAN access map.</td>
</tr>
</tbody>
</table>

| Defaults            | This command has no default settings. |

| Command Modes       | Privileged EXEC mode |

<table>
<thead>
<tr>
<th>Command History</th>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.1(12c)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Examples</th>
<th>This command shows how to display the contents of a VLAN access map:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch#</td>
<td><code>show vlan access-map mordred</code></td>
</tr>
<tr>
<td>Vlan access-map</td>
<td><code>&quot;mordred&quot;</code> 1</td>
</tr>
<tr>
<td></td>
<td><code>match: ip address 13</code></td>
</tr>
<tr>
<td></td>
<td><code>action: forward capture</code></td>
</tr>
<tr>
<td>Switch#</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>vlan access-map</code></td>
<td>Enters VLAN access-map command mode to create a VLAN access map.</td>
</tr>
</tbody>
</table>
show vlan counters

To display the software-cached counter values, use the `show vlan counters` command.

```
show vlan [id vlanid] counters
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id vlanid</td>
<td>(Optional) Displays the software-cached counter values for a specific VLAN.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 Series Switches.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

If you enter the `show vlan counters` command without specifying the VLAN ID, the software-cached counter values for all VLANs are displayed.

**Examples**

This example shows how to display the software-cached counter values for a specific VLAN:

```
Switch# show vlan counters
* Multicast counters include broadcast packets

Vlan Id              : 1
L2 Unicast Packets   : 0
L2 Unicast Octets    : 0
L3 Input Unicast Packets : 0
L3 Input Unicast Octets : 0
L3 Output Unicast Packets : 0
L3 Output Unicast Octets : 0
L3 Output Multicast Packets : 0
L3 Output Multicast Octets : 0
L3 Input Multicast Packets : 0
L3 Input Multicast Octets : 0
L2 Multicast Packets  : 1
L2 Multicast Octets   : 94

Switch>
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear vlan counters</td>
<td>Clears the software-cached counter values to start from zero again for a specified VLAN or all existing VLANs.</td>
</tr>
</tbody>
</table>
show vlan dot1q tag native

To display all the ports on the switch that are eligible for native VLAN tagging as well as their current native VLAN tagging status, use the `show vlan dot1q tag native` command.

```
show vlan dot1q tag native
```

**Syntax Description**

This command has no arguments or keywords.

**Defaults**

This command has no default settings.

**Command Modes**

User EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(18)EW</td>
<td>This command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

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 globally

Per Port Native Vlan Tagging State
-----------------------------------

<table>
<thead>
<tr>
<th>Port</th>
<th>Operational Mode</th>
<th>Native VLAN Tagging State</th>
</tr>
</thead>
<tbody>
<tr>
<td>f3/2</td>
<td>trunk</td>
<td>enabled</td>
</tr>
<tr>
<td>f3/16</td>
<td>PVLAN trunk</td>
<td>disabled</td>
</tr>
<tr>
<td>f3/16</td>
<td>trunk</td>
<td>enabled</td>
</tr>
</tbody>
</table>
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>switchport mode</code></td>
<td>Sets the interface type.</td>
</tr>
<tr>
<td><code>vlan (global configuration)</code></td>
<td>(refer to Cisco IOS documentation) Enters global VLAN configuration mode.</td>
</tr>
<tr>
<td><code>vlan (VLAN configuration)</code></td>
<td>(refer to Cisco IOS documentation) Enters VLAN configuration mode.</td>
</tr>
</tbody>
</table>
show vlan group

To display the VLANs mapped to VLAN groups, use the **show vlan group** privileged EXEC command.

```
show vlan group [group-name group-name]
```

**Syntax Description**

- **group-name**
  - (Optional) Displays the VLANs mapped to the specified VLAN group.

**Defaults**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2(54)SG</td>
<td>This command was modified to support user distribution on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The **show vlan group** command displays the existing VLAN groups and lists the VLANs and VLAN ranges that are members of each VLAN group. If you use the **group-name** keyword, you display only the members of the VLAN group specified by the **group-name** argument.

**Examples**

This example shows how to display the members of a specified VLAN group:

```
Switch# show vlan group group-name ganymede

Group Name Vlans Mapped
---------------- --------
ganymede 7-9
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vlan group</strong></td>
<td>Creates or modifies a VLAN group.</td>
</tr>
</tbody>
</table>
show vlan internal usage

To display information about the internal VLAN allocation, use the `show vlan internal usage` command.

```
show vlan [id vlan-id] internal usage
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>id vlan-id</td>
<td>(Optional) Displays internal VLAN allocation information for the specified VLAN; valid values are from 1 to 4094.</td>
<td></td>
</tr>
</tbody>
</table>

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(19)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display information about the current internal VLAN allocation:

```
Switch# show vlan internal usage

VLAN Usage
---- ----------------------
1025 -
1026 -
1027 -
1028 -
1029 Port-channel6
1030 GigabitEthernet1/2
1032 FastEthernet3/20
1033 FastEthernet3/21
1129 -
```

This example shows how to display information about the internal VLAN allocation for a specific VLAN:

```
Switch# show vlan id 1030 internal usage

VLAN Usage
---- ----------------------
1030 GigabitEthernet1/2
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vlan internal allocation policy</td>
<td>Configures the internal VLAN allocation scheme.</td>
</tr>
</tbody>
</table>
show vlan mapping

Use the show vlan mapping privileged EXEC command to display information about VLAN mapping on trunk ports.

```
show vlan mapping [interface interface-id] [ | {begin | exclude | include} expression]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface interface-id</td>
<td>(Optional) Displays VLAN mapping information for the specified interface.</td>
</tr>
<tr>
<td></td>
<td>(Optional) Displays begins with the line that matches the expression.</td>
</tr>
<tr>
<td></td>
<td>(Optional) Displays excludes lines that match the expression.</td>
</tr>
<tr>
<td></td>
<td>(Optional) Displays includes lines that match the specified expression.</td>
</tr>
<tr>
<td>expression</td>
<td>Specifies an expression in the output to use as a reference point.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Defaults</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Privileged 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>12.2(54)SG</td>
<td>This command was introduced on the Catalyst 4500 series switch.</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. |

<table>
<thead>
<tr>
<th>Examples</th>
<th>This is a sample output from the show vlan mapping command:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Switch# show vlan mapping</td>
</tr>
<tr>
<td></td>
<td>Interface Fa0/5:</td>
</tr>
<tr>
<td></td>
<td>VLANS on wire</td>
</tr>
<tr>
<td></td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>default QinQ</td>
</tr>
<tr>
<td></td>
<td>Interface Fa0/2:</td>
</tr>
<tr>
<td></td>
<td>VLANS on wire</td>
</tr>
<tr>
<td></td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>This is a sample output from the show vlan mapping command for an interface:</td>
</tr>
<tr>
<td></td>
<td>Switch# show vlan mapping interface fa0/6</td>
</tr>
<tr>
<td></td>
<td>Interface fa0/6:</td>
</tr>
<tr>
<td></td>
<td>VLAN on wire</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>12,16-18</td>
</tr>
<tr>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
show vlan mapping

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>switchport vlan mapping</td>
<td>Configures VLAN mapping on an interface.</td>
</tr>
</tbody>
</table>
show vlan mtu

To display the minimum and maximum transmission unit (MTU) sizes of each VLAN, use the show vlan mtu command.

Syntax Description
This command has no arguments or keywords.

Defaults
This command has no default settings.

Command Modes
Privileged EXEC mode

Command History
Release Modification
12.1(13)EW Support for this command was introduced on the Catalyst 4500 series switch.

Usage Guidelines
The MTU_Mismatch column in the command output indicates whether all the ports in the VLAN have the same MTU. When “yes” is displayed in the MTU_Mismatch column, it means that the VLAN has a port with different MTUs, and packets might be dropped that are switched from a port with a larger MTU to a port with a smaller MTU. If the VLAN does not have an SVI, the hyphen (-) symbol is displayed in the SVI_MTU column.

For a VLAN, if the MTU-Mismatch column displays “yes,” the names of the port with the MinMTU and the port with the MaxMTU are displayed. For a VLAN, if the SVI_MTU is bigger than the MinMTU, “TooBig” is displayed after the SVI_MTU.

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

```
Switch# show vlan mtu

VLAN    SVI_MTU    MinMTU(port)    MaxMTU(port)    MTU_Mismatch
---- ------------- -------------  ------------  ------------
1    1500          1500           1500           No

Switch>
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mtu</td>
<td>Enables jumbo frames on an interface by adjusting the maximum size of a packet or maximum transmission unit (MTU).</td>
</tr>
</tbody>
</table>
show vlan private-vlan

To display private VLAN information, use the `show vlan private-vlan` command.

```
show vlan private-vlan [type]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>(Optional) Displays the private VLAN type; valid types are isolated, primary, community, twoway-community, non-operational, and normal.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

- **Release** | **Modification**
- 12.1(8a)EW | Support for this command was introduced on the Catalyst 4500 series switch.
- 12.2(20)EW | Support for community VLAN was added.
- 15.1.0 SG | Support for PVLAN modes over EtherChannel. Modes include: private-vlan host, private-vlan promiscuous, private-vlan trunk secondary, and private-vlan trunk promiscuous.

### Usage Guidelines

When the `show vlan private-vlan type` command displays a VLAN type as normal, it indicates that a regular VLAN has been used in the private VLAN configuration. When normal is displayed, this indicates that two VLANs have been associated before the type was set, and the private VLAN is not operational. This information is useful for debugging purposes.

### Examples

This example shows how to display information about all currently configured private VLANs:

```
Switch# show vlan private-vlan

    Primary  Secondary  Type              Ports
------- --------- ----------------- ------------------------------------------
   2       301       community         Fa5/3, Fa5/25
   2       302       community
   2       303       community         Fa5/3, Po63
   10        community
  100      101       isolated
  150      151       non-operational
   202       community
   303       twoway-community
   401      402       non-operational
Switch#
```

### Note

A blank Primary value indicates that no association exists.
This example shows how to display information about all currently configured private VLAN types:

```
Switch# show vlan private-vlan type
```

<table>
<thead>
<tr>
<th>Vlan Type</th>
<th>Primary</th>
<th>Secondary</th>
<th>Secondary-Type</th>
<th>Ports</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
<td>primary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>303</td>
<td>community</td>
<td></td>
<td>community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>304</td>
<td>community</td>
<td></td>
<td>community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>305</td>
<td>community</td>
<td></td>
<td>community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>306</td>
<td>community</td>
<td></td>
<td>community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>307</td>
<td>community</td>
<td></td>
<td>community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>308</td>
<td>normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>309</td>
<td>community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>440</td>
<td>isolated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Switch#

Table 2-42 describes the fields in the `show vlan private-vlan` command output.

**Table 2-42** *show vlan private-vlan Command Output Fields*

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Number of the primary VLAN.</td>
</tr>
<tr>
<td>Secondary</td>
<td>Number of the secondary VLAN.</td>
</tr>
<tr>
<td>Secondary-Type</td>
<td>Secondary VLAN type is <em>isolated</em> or <em>community</em>.</td>
</tr>
<tr>
<td>Ports</td>
<td>Indicates the ports within a VLAN.</td>
</tr>
<tr>
<td>Type</td>
<td>Type of VLAN; possible values are <em>primary</em>, <em>isolated</em>, community, nonoperational, or <em>normal</em>.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>private-vlan</code></td>
<td>Configures private VLANs and the association between a private VLAN and a secondary VLAN.</td>
</tr>
<tr>
<td><code>private-vlan mapping</code></td>
<td>Creates a mapping between the primary and the secondary VLANs so that both share the same primary VLAN SVI.</td>
</tr>
</tbody>
</table>
show vlan remote-span

To display a list of Remote SPAN (RSPAN) VLANs, use the `show vlan remote-span` command.

```
show vlan remote-span
```

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

### Defaults
This command has no default settings.

### Command Modes
Privileged EXEC mode

### Command History
```
<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(12)EW</td>
<td>This command was introduced on the Catalyst 4500 Series Switches.</td>
</tr>
</tbody>
</table>
```

### Examples
This example shows how to display a list of RSPAN VLANs:

```
Router# show vlan remote-span
Remote SPAN VLANs
---------------------------------------------------------------
2,20
```

### Related Commands
```
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>remote-span</code></td>
<td>Converts a VLAN into an RSPAN VLAN.</td>
</tr>
<tr>
<td><code>vlan (VLAN Database mode)</code></td>
<td>Configures a specific VLAN.</td>
</tr>
</tbody>
</table>
```
show vmps

To display the VLAN Query Protocol (VQP) version, reconfirmation interval, retry count, VLAN Membership Policy Server (VMPS) IP addresses, current servers, and primary servers, use the `show vmps` command.

```
show vmps [statistics]
```

**Syntax Description**
statistic (Optional) Displays the client-side statistics.

**Defaults**
This command has no default settings.

**Command Modes**
Privileged EXEC mode

**Command History**
<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(13)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**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: 172.20.50.120 (primary, current)
Reconfirmation status
---------------------
VMPS Action: No Dynamic Port
Switch#
```

This is an example of output from the `show vmps statistics` command:

```
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
Switch#
```

**Related Commands**
statistics (Optional) Displays the client-side statistics.
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vmps reconfirm</code> (privileged EXEC)</td>
<td>Sends VLAN Query Protocol (VQP) queries to reconfirm all the dynamic VLAN assignments with the VLAN Membership Policy Server (VMPS).</td>
</tr>
</tbody>
</table>
show vslp (virtual switch)

To display Virtual Switch Link Protocol (VSLP) instance information, use the `show vslp` command in EXEC mode.

```bash
show vslp {lmp | rrp [type]} | {instances | lmp [type] | packet [counters] | rrp [type]}
```

### Syntax Description

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>lmp</td>
<td>Specifies the Link Maintenance Protocol (LMP) information.</td>
</tr>
<tr>
<td>rrp</td>
<td>Specifies the Role Resolution Protocol (RRP) information.</td>
</tr>
<tr>
<td>type</td>
<td>Specifies the type of information; see the &quot;Usage Guidelines&quot; section for valid values.</td>
</tr>
<tr>
<td>instances</td>
<td>Displays the VSLP instance mappings.</td>
</tr>
<tr>
<td>packet</td>
<td>Displays the VSLP packet information.</td>
</tr>
<tr>
<td>counters</td>
<td>(Optional) Displays the VSLP packet counter information.</td>
</tr>
</tbody>
</table>

### Defaults

This command has no default settings.

### Command Modes

Privileged EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS XE 3.4.0SG and 15.1(2)SG</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

The valid values for the `type` argument are as follows:

- `counters`—Displays counter information.
- `detail`—Displays detailed information.
- `fsm`—Displays Finite State Machine (FSM) information.
- `neighbors`—Displays neighbor information (supported with the `lmp` keyword only).
- `status`—Displays status information.
- `summary`—Displays a summary of information.
- `timer`—Displays Tx and Rx hello timer values.

The timers already displayed in the `show vslp lmp` timers output are shown in the output of the `show vslp lmp summary` command.

The output of the `show vslp rrp detail` command includes the information from the following commands:

- `show vslp rrp summary`
- `show vslp rrp counters`
- `show vslp rrp fsm`
The following example shows how to display a summary of LMP information for a specific VSLP instance.

Router# show vslp 2 lmp summary
LMP summary
Link info: Configured: 2 Operational: 0
<table>
<thead>
<tr>
<th>Port</th>
<th>Flag</th>
<th>State</th>
<th>Peer</th>
<th>Flag</th>
<th>MAC</th>
<th>Switch</th>
<th>Port</th>
<th>(Time remaining)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/1</td>
<td>v</td>
<td>link_down</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4/2</td>
<td>v</td>
<td>link_down</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Router#

The following example shows how to displays the VSLP instance mappings.

Router# show vslp instances
VSLP instance mappings:
<table>
<thead>
<tr>
<th>Instance Num</th>
<th>Name</th>
<th>Switch Num</th>
<th>Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>VSL</td>
<td>2</td>
<td>0x00000001</td>
</tr>
</tbody>
</table>
Router#

The following example shows how to display LMP neighbor information:

Router# show vslp 2 lmp neighbors
LMP neighbors
Peer Group info: # Groups: 0
Router#

The following example shows how to display a summary of LMP information:

Router# show vslp lmp summary
Instance #1:
LMP summary
Link info: Configured: 3 Operational: 1
<table>
<thead>
<tr>
<th>Interface</th>
<th>Flag</th>
<th>State</th>
<th>Peer</th>
<th>Flag</th>
<th>MAC</th>
<th>Switch</th>
<th>Interface</th>
<th>(Time remaining)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/3/1</td>
<td>v</td>
<td>link_down</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Gi1/6/4</td>
<td>T4(240ms) T5(2.22s)</td>
</tr>
<tr>
<td>Gi1/5/4</td>
<td>vf</td>
<td>operational</td>
<td>vf</td>
<td>0013.5fcb.1480</td>
<td>2</td>
<td>Gi1/6/4</td>
<td>T4(240ms) T5(2.22s)</td>
<td></td>
</tr>
<tr>
<td>Gi1/5/5</td>
<td>v</td>
<td>link_down</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Flags: V - valid f -> B - bidirectional

The following examples shows how to display the LMP Tx and Rx hello timer values:

Router# show vslp lmp timer
Instance #1:
LMP hello timer
<table>
<thead>
<tr>
<th>Interface</th>
<th>State</th>
<th>Hello Tx (T4) ms</th>
<th>Hello Rx (T5*) ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/9/1</td>
<td>link_down</td>
<td>1000</td>
<td>500000</td>
</tr>
<tr>
<td>Gi1/9/3</td>
<td>link_down</td>
<td>1000</td>
<td>500000</td>
</tr>
<tr>
<td>Gi1/9/5</td>
<td>link_down</td>
<td>1000</td>
<td>500000</td>
</tr>
</tbody>
</table>
Router#

The following example shows how to display VSLP packet information:

Router# show vslp packet
VSLP packet counters
Transmitted:
total  = 1543
total error = 0
err_cksum = 0
eobc      = 0
The following example shows how to display VSLP packet counter information:

```bash
Router# show vslp packet counters
VSLP packet counters
Transmitted:
  total = 28738
  error = 0
  err_cksum = 0
  eobc = 28738
  eobc[LMP] = 28701
  eobc[RRP] = 17
  eobc[PING] = 20
  ibc = 0
  ibc[LMP] = 0
  ibc[RRP] = 0
  ibc[PING] = 0

Received:
  total = 28590
  error = 0
  err_cksum = 0
  eobc = 28590
  eobc[LMP] = 28552
  eobc[RRP] = 18
  eobc[PING] = 20
  ibc = 0
  ibc[LMP] = 0
  ibc[RRP] = 0
  ibc[PING] = 0

Router#
```

The following example shows how to display a summary of RRP information:

```bash
Router# show vslp rrp summary
RRP information for Instance 1
-----------------------------------------------
<table>
<thead>
<tr>
<th>Valid Flags</th>
<th>Peer Count</th>
<th>Preferred</th>
<th>Reserved</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUE</td>
<td>V 1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Switch | Peer Number | Status | Preempt | Priority | Role | Local SID | Remote SID |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>0</td>
<td>UP</td>
<td>TRUE</td>
<td>200</td>
<td>ACTIVE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Remote</td>
<td>1</td>
<td>UP</td>
<td>FALSE</td>
<td>100</td>
<td>STANDBY</td>
<td>9272</td>
<td>271</td>
</tr>
</tbody>
</table>
Flags: V - valid
```
show vtp

To display VTP statistics and domain information, use the `show vtp` command.

```
show vtp {counters | status}
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>counters</td>
<td>Specifies the VTP statistics.</td>
</tr>
<tr>
<td>status</td>
<td>Specifies the VTP domain status.</td>
</tr>
</tbody>
</table>

**Defaults**

This command has no default settings.

**Command Modes**

Privileged EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1(8a)EW</td>
<td>Support for this command was introduced on the Catalyst 4500 series switch.</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to display the VTP statistics:

```
Switch# show vtp counters
VTP statistics:
Summary advertisements received : 1
Subset advertisements received   : 1
Request advertisements received  : 0
Summary advertisements transmitted: 31
Subset advertisements transmitted : 1
Request advertisements transmitted: 0
Number of config revision errors : 0
Number of config digest errors   : 0
Number of V1 summary errors     : 0

VTP pruning statistics:

Trunk                  Join Transmitted Join Received Summary advts received from non-pruning-capable device
---------------------- ---------------- ---------------- --------------------------
Fa5/9                  1555             1564             0

Switch#
```

This example shows how to display the VTP domain status:

```
Switch# show vtp status
VTP Version : 2
Configuration Revision : 250
Maximum VLANs supported locally : 1005
Number of existing VLANs : 33
VTP Operating Mode : Server
VTP Domain Name : Lab_Network
VTP Pruning Mode : Enabled
VTP V2 Mode : Enabled
VTP Traps Generation : Disabled
```
This example shows how to display only those lines in the `show vtp` output that contain the word `Summary`:

```
Switch# show vtp counters | include Summary
Summary advertisements received : 1
Summary advertisements transmitted : 32
```

Table 2-43 describes the fields in the `show vtp` command output.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary advertisements received</td>
<td>Total number of summary advertisements received.</td>
</tr>
<tr>
<td>Subset advertisements received</td>
<td>Total number of subset advertisements received.</td>
</tr>
<tr>
<td>Request advertisements received</td>
<td>Total number of request advertisements received.</td>
</tr>
<tr>
<td>Summary advertisements transmitted</td>
<td>Total number of summary advertisements transmitted.</td>
</tr>
<tr>
<td>Subset advertisements transmitted</td>
<td>Total number of subset advertisements transmitted.</td>
</tr>
<tr>
<td>Request advertisements transmitted</td>
<td>Total number of request advertisements transmitted.</td>
</tr>
<tr>
<td>Number of config revision errors</td>
<td>Number of config revision errors.</td>
</tr>
<tr>
<td>Number of config digest errors</td>
<td>Number of config revision digest errors.</td>
</tr>
<tr>
<td>Number of V1 summary errors</td>
<td>Number of V1 summary errors.</td>
</tr>
<tr>
<td>Trunk</td>
<td>Trunk port participating in VTP pruning.</td>
</tr>
<tr>
<td>Join Transmitted</td>
<td>Number of VTP-Pruning Joins transmitted.</td>
</tr>
<tr>
<td>Join Received</td>
<td>Number of VTP-Pruning Joins received.</td>
</tr>
<tr>
<td>Summary advts received from non-pruning-capable device</td>
<td>Number of Summary advertisements received from nonpruning-capable devices.</td>
</tr>
<tr>
<td>Number of existing VLANs</td>
<td>Total number of VLANs in the domain.</td>
</tr>
<tr>
<td>Configuration Revision</td>
<td>VTP revision number used to exchange VLAN information.</td>
</tr>
<tr>
<td>Maximum VLANs supported locally</td>
<td>Maximum number of VLANs allowed on the device.</td>
</tr>
<tr>
<td>Number of existing VLANs</td>
<td>Number of existing VLANs.</td>
</tr>
<tr>
<td>VTP Operating Mode</td>
<td>Indicates whether VTP is enabled or disabled.</td>
</tr>
<tr>
<td>VTP Domain Name</td>
<td>Name of the VTP domain.</td>
</tr>
<tr>
<td>VTP Pruning Mode</td>
<td>Indicates whether VTP pruning is enabled or disabled.</td>
</tr>
<tr>
<td>VTP V2 Mode</td>
<td>Indicates the VTP V2 mode as server, client, or transparent.</td>
</tr>
<tr>
<td>VTP Traps Generation</td>
<td>Indicates whether VTP trap generation mode is enabled or disabled.</td>
</tr>
<tr>
<td>MD5 digest</td>
<td>Checksum values.</td>
</tr>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vtp [global configuration mode]</td>
<td>Modifies the name of a VTP configuration storage file.</td>
</tr>
<tr>
<td>vtp client</td>
<td>Places a device in VTP client mode.</td>
</tr>
<tr>
<td>vtp domain</td>
<td>Configures the administrative domain name for a device.</td>
</tr>
<tr>
<td>vtp password</td>
<td>Creates a VTP domain password.</td>
</tr>
<tr>
<td>vtp pruning</td>
<td>Enables pruning in the VLAN database.</td>
</tr>
<tr>
<td>vtp server</td>
<td>Places the device in VTP server mode.</td>
</tr>
<tr>
<td>vtp transparent</td>
<td>Places device in VTP transparent mode.</td>
</tr>
<tr>
<td>vtp v2-mode</td>
<td>Enables version 2 mode.</td>
</tr>
</tbody>
</table>