# 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**

inter	face	(Optional) Interface type; valid values are <b>ethernet</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>and port-channel</b> .
inter	face-number	(Optional) Interface number.

#### Defaults

This command has no default settings.

#### **Command Modes**

Privileged EXEC mode

#### **Command History**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(25)EW	Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.

#### **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#

Command	Description
access-group mode	Specifies the override modes (for example, VACL overrides PACL) and the non-override modes (for example, merge or strict mode).

### 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 <b>ethernet</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>pos</b> , <b>ge-wan</b> , and <b>atm</b> .
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 <b>0</b> .
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**

Release	Modification
12.2(25)EW	Extended to include the 10-Gigabit Ethernet interface.

#### **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.

Switch#

- 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)

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 FastEthernet2/3 172.20.52.1(3045) 0 packets, 0 bytes 00000000FF92000038000000000000 00605C865B2800D0BB0F980B0800 03:58:12 ΤP FastEthernet2/3 172.20.52.22(11) 0 packets, 0 bytes 00000000FF92000038000000000000 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#
```

Command	Description
debug adjacency	Displays information about the adjacency debugging.

# show ancp multicast

To display multicast streams activated by 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 mode

#### **Command History**

Release	Modification
12.2(50)SG	Support for this command was introduced on the Catalyst 4500 series switch.

#### **Usage Guidelines**

This table of multicast streams on the box that have been activated with ANCP should match what is displayed on the standby table because its content is replicated for best availability.

#### **Examples**

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

ANCP-Client# show ancp mul

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
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
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**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### 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

Command	Description
access-group mode	Specifies the override modes (for example, VACL overrides PACL) and the non-override modes (for example, merge or strict mode).
arp access-list	Defines an ARP access list or adds clauses at the end of a predefined list.
ip arp inspection filter vlan	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.

### show authentication

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

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

#### **Syntax Description**

interface interface registrations sessions	Displays all of the Auth Manager details associated with the specified interface.  Displays details of all methods registered with the Auth Manager.
sessions	
SCSSIONS	Displays detail 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).
session-id session-id	(Optional) Specifies an Auth Manager session.
handle handle	(Optional) Range: 1 to 4294967295.
mac mac	(Optional) Displays Auth Manager session information for a specified MAC address.
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**

Release	Modification
12.2(50)SG	Support for this command was introduced on the Catalyst 4500 series switch.

#### **Usage Guidelines**

Table 2-13 describes the significant fields shown in the show authentication display.



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

Table 2-13 show authentication Command Output

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

Table 2-14 lists the possible values for the state of methods. For a session in terminal state, "Authous Success," "Authous 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), with "Not run" in the case of sessions that are synchronized on standby.

Table 2-14 State Method Values

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

#### **Examples**

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

```
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 Interface MAC Address Method Domain Status Session ID Gi3/45 (unknown) N/A DATA Authz Failed 0908140400000007003651EC Gi3/46 (unknown) N/A DATA Authz Success 09081404000000080057C274 Switch#

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
Switch#
```

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
Switch#
```

Command	Description
authentication control-direction	Changes the port control to unidirectional or bidirectional.
authentication critical recovery delay	Configures the 802.1X critical authentication parameters.
authentication event	Configures the actions for authentication events.
authentication fallback	Enables the Webauth fallback and specifies the fallback profile to use when failing over to Webauth.
authentication host-mode	Defines the classification of a session that will be used to apply the access-policies using the host-mode configuration.
authentication open	Enables open access on this port.
authentication order	Specifies the order in which authentication methods should be attempted for a client on an interface.
authentication periodic	Enables reauthentication for this port.
authentication	Configures the port-control value.
port-control	
authentication priority	Specifies the priority of authentication methods on an interface.
authentication timer	Configures the authentication timer.

### 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**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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 gos
- 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#

Command	Description
auto qos voip	Automatically configures quality of service (auto-QoS) for Voice
	over IP (VoIP) within a QoS domain.

### show bootflash:

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

show bootflash: [all | chips | filesys]

#### **Syntax Description**

all	(Optional) Displays all possible Flash information.
chips	(Optional) Displays Flash chip information.
filesys	(Optional) Displays file system information.

**Defaults** 

This command has no default settings.

#### **Command Modes**

**EXEC** 

#### **Command History**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **Examples**

This example shows how to display file system status information:

Switch> show bootflash: filesys

```
----- FILE SYSTEM STATUS-----
 Device Number = 0
DEVICE INFO BLOCK: bootflash
 Magic Number
                     = 6887635 File System Vers = 10000
                                                          (1.0)
                     = 1000000 Sector Size = 40000
 Length
 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
   Spares:
STATUS INFO:
 Writable
 NO File Open for Write
 Complete Stats
 No Unrecovered Errors
 No Squeeze in progress
USAGE INFO:
              = 917CE8 Bytes Available = 628318
 Bytes Used
 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-
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)
                     = 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:
             = 917CE8 Bytes Available = 628318
 Bytes Used
 Bad Sectors = 0 Spared Sectors = 0
           = 2
                        Bytes = 917BE8
 OK Files
 Deleted Files = 0 Bytes = 0
Files w/Errors = 0 Bytes = 0
Switch>
```

### show bootvar

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** 

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### 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* } }



This command will be deprecated in future Cisco IOS releases. Please use the **diagnostic start** command.

#### **Syntax Description**

interface interface	Interface type; valid values are <b>fastethernet</b> and <b>gigabitethernet</b> .
interface-number	Module and port number.

#### Defaults

This command has no default settings.

#### **Command Modes**

Privileged EXEC mode

#### **Command History**

Release	Modification
12.2(25)SG	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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 OMbps	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 2-15 describes the fields in the show cable-diagnostics tdr command output.

Table 2-15 show cable-diagnostics tdr Command Output Fields

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

Command	Description
test cable-diagnostics tdr	Tests the condition of copper cables on 48-port 10/100/1000 BASE-T modules.

# 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 <b>ethernet</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>port-channel</b> , and <b>vlan</b> .
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**

Release	Modification
12.2(25)EW	Extended to include the 10-Gigabit Ethernet interface.

#### **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	s: R - Router, T -	Trans Brid	lge, B - Sourc	e Route Br	idge
	S - Switch, H -	Host, I -	IGMP, r - Rep	eater, P -	Phone
Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
lab-7206	Eth 0	157	R	7206VXR	Fas 0/0/0
lab-as5300-1	Eth 0	163	R	AS5300	Fas 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	Fas 0/0
lab-3621	Eth 0	140	R S	3631-telc	oFas 0/0
008024 2758E0	Eth 0	132	T	CAT3000	1/2
Switch#					

Table 2-16 describes the fields that are shown in the example.

Table 2-16 show cdp neighbors Field Descriptions

Field	Definition
Device ID	Configured ID (name), MAC address, or serial number of the neighbor device.
Local Intrfce	(Local Interface) The protocol that is used by the connectivity media.
Holdtme	(Holdtime) Remaining amount of time, in seconds, that the current device holds the CDP advertisement from a transmitting router before discarding it.
Capability	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
Platform	Product number of the device.
Port ID	Protocol and port number of the device.

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 2-17 describes the fields that are shown in the example.

Table 2-17 show cdp neighbors detail Field Descriptions

Field	Definition
Device ID	Name of the neighbor device and either the MAC address or the serial number of this device.
Entry address(es)	List of network addresses of neighbor devices.
[network protocol] address	Network address of the neighbor device. The address can be in IP, IPX, AppleTalk, DECnet, or CLNS protocol conventions.
Platform	Product name and number of the neighbor device.
Capabilities	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.
Interface	Protocol and port number of the port on the current device.
Holdtime	Remaining amount of time, in seconds, that the current device holds the CDP advertisement from a transmitting router before discarding it.
Version:	Software version running on the neighbor device.
advertisement version:	Version of CDP that is being used for CDP advertisements.
Duplex:	Duplex state of connection between the current device and the neighbor device.

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

### show class-map

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

show class-map class\_name

#### **Syntax Description**

ciuss_nume Ivallic of the class map	class_name	Name of the class map.
-------------------------------------	------------	------------------------

#### 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(25)SG	Displays results from the full flow option.

#### **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	2.0	6789	21

With following configuration, each flow will be 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 \mathtt{CNTL}/\mathtt{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#
```

Command	Description
class-map	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.
show policy-map	Displays information about the policy map.
show policy-map interface	Displays the statistics and configurations of the input and output policies that are attached to an interface.

### 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**

all	Displays all the modules on the chassis.
num	Module number.

#### **Defaults**

This command has no default settings.

#### **Command Modes**

**EXEC** 

#### **Command History**

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

#### **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

o/* - Ongoing test, always active / NA
```

				resting interval
1	D	Test Name	Attributes	(day hh:mm:ss.ms)
=	===		=========	===========
	1)	<pre>supervisor-bootup&gt;</pre>	**D****I**	not configured
	2)	<pre>packet-memory-bootup&gt;</pre>	**D****I**	not configured
	3)	<pre>packet-memory-ongoing&gt;</pre>	**N****I*o	not configured

```
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
```

		ŗ	Testing Interval
ID	Test Name	Attributes	(day hh:mm:ss.ms)
====	=======================================	=========	===========
1)	linecard-online-diag>	**D****I**	not configured

Switch#

Command	Description
show diagnostic result module	Displays the module-based diagnostic test results.
show diagnostic result module test 2	Displays the results of the bootup packet memory test.
show diagnostic result module test 3	Displays the results from the ongoing packet memory test.

## 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**

slot-num	(Optional) Specifies the slot on which diagnostics are displayed.	
all	(Optional) Displays the diagnostics for all slots.	
test	(Optional) Displays selected tests on the specified module.	
test-id	(Optional) Specifies a single test ID.	
test-id-range	(Optional) Specifies a range of test IDs.	
all	(Optional) Displays the diagnostics for all tests.	
detail	(Optional) Displays the complete test results.	

#### **Defaults**

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

#### **Command Modes**

Privileged EXEC mode

#### **Command History**

Release	Modification
12.2(18)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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: \ .
12: . 13: . 14: . 15: . 16: . 17: . 18: . 19: . 20: . 21: . 22: . 23: .
24: . 25: . 26: . 27: . 28: . 29: . 30: . 31: .
Port Traffic: L2 Asic Loopback ...
0: . 1: . 2: . 3: . 4: . 5: . 6: . 7: . 8: . 9: . 10: . 11: .
```

```
12: . 13: . 14: . 15: . 16: . 17: . 18: . 19: . 20: . 21: . 22: . 23: .
24: . 25: . 26: . 27: . 28: . 29: . 30: . 31:
Port Traffic: L3 Asic Loopback ...
0: . 1: . 2: . 3: . 4: . 5: . 6: . 7: . 8: . 9: . 10: . 11: .
12: . 13: . 14: . 15: . 16: . 17: . 18: . 19: . 20: . 21: . 22: . 23: .
24: . 25: . 26: . 27: . 28: . 29: . 30: . 31: . au: .
Switch Subsystem Memory ...
1: . 2: . 3: . 4: . 5: . 6: . 7: . 8: . 9: . 10: . 11: . 12: .
13: . 14: . 15: . 16: . 17: . 18: . 19: . 20: . 21: . 22: . 23: . 24: .
25: . 26: . 27: . 28: . 29: . 30: . 31: . 32: . 33: . 34: . 35: . 36: .
37: . 38: . 39: . 40: . 41: . 42: . 43: . 44: . 45: . 46: . 47: . 48: .
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 ----> U
       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
```

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```
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
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
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  $[N \mid all]$  [test test-id] [detail]

#### **Syntax Description**

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

**Defaults** 

Non-detailed results

**Command Modes** 

EXEC mode

#### **Command History**

Release	Modification
12.2(25)SG	This command was introduced on the Catalyst 4500 series switch.

#### **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 ----->

```
Slot Ports Card Type
                                    Diag Status
                                                Diag Details
6 48 10/100/1000BaseT (RJ45)V, Cisco/IEEE Passed
                                             None
Detailed Status
_____
               U = Unknown
. = Pass
L = Loopback failure S = Stub failure
\begin{array}{lll} \mbox{I = Ilc failure} & \mbox{P = Port failure} \\ \mbox{E = SEEPROM failure} & \mbox{G = GBIC integrity check failure} \end{array}
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
  ______
      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
      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
Detailed Status
TDR test is in progress on interface Gi6/1
```

Switch#

Command	Description
diagnostic start	Runs the specified diagnostic test.

### 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**

N	Specifies the module number.
detail	(Optional) Specifies the display of detailed information for analysis.

#### Defaults

Non-detailed results

#### **Command Modes**

EXEC mode

#### **Command History**

Release	Modification
12.2(18)EW	This command was introduced on the Catalyst 4500 series switch.

#### **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)
```

```
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.
```

Command	Description
diagnostic monitor action	Directs the action of the switch when it detects a packet memory failure.
show diagnostic result module test 3	Displays the results from the ongoing packet memory test.

### 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**

Release	Modification
12.2(18)EW	This command was introduced on the Catalyst 4500 series switch.

#### **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
```

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)
```

```
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
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
Per day in the last 30 days:
    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
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: v
Last 1000 Packet Memory errors:
First 1000 Packet Memory errors:
```

Command	Description
diagnostic monitor action	Directs the action of the switch when it detects a packet memory failure.
show diagnostic result module test 2	Displays the results of the bootup packet memory test.

### 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**

interface interface-id	(Optional) Displays the 802.1X status for the specified port.
statistics	(Optional) Displays 802.1X statistics for the switch or the specified interface.
all	(Optional) Displays per-interface 802.1X configuration information for all interfaces with a non-default 802.1X configuration.

**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.
12.1(19)EW	Display enhanced to show the guest-VLAN value.
12.2(25)EW	Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.
12.2(25)EWA	Support for currently-assigned reauthentication timer (if the timer is configured to honor the Session-Timeout value) was added.
12.2(31)SG	Support for port direction control and critical recovery was added.

#### **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.

#### **Examples**

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
                       = AUTHENTICATOR
PAE
PortControl
                      = AUTO
ControlDirection
                      = Both
                      = MULTI_DOMAIN
HostMode
ReAuthentication
                      = Disabled
                      = 60
QuietPeriod
ServerTimeout
                       = 30
SuppTimeout
                       = 30
ReAuthPeriod
                       = 3600 (Locally configured)
ReAuthMax
                       = 2.
                       = 2.
MaxReq
TxPeriod
                       = 30
RateLimitPeriod
Dot1x Authenticator Client List
Domain
                       = DATA
       ant = 0000.0000.ab01
Auth SM State = AUTHENTICATED
Supplicant
       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 2-18 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.

Table 2-18 show dot1x interface Field Description

Field	Description
PortStatus	Status of the port (authorized or unauthorized). The status of a port is displayed as authorized if the <b>dot1x port-control</b> interface configuration command is set to <b>auto</b> and has successfully completed authentication.
Port Control	Setting of the <b>dot1x port-control</b> interface configuration command.
MultiHosts	Setting of the <b>dot1x multiple-hosts</b> interface configuration command (allowed or disallowed).

This is an example of output from the **show dot1x statistics interface gigabitethernet1/1** command. Table 2-19 describes the fields in the display.

Switch# show dot1x statistics interface gigabitethernet1/1

Table 2-19 show dot1x statistics Field Descriptions

Field	Description
TxReq/TxReqId	Number of EAP-request/identity frames that have been sent.
TxTotal	Number of EAPOL frames of any type that have been sent.
RxStart	Number of valid EAPOL-start frames that have been received.
RxLogoff	Number of EAPOL-logoff frames that have been received.
RxRespId	Number of EAP-response/identity frames that have been received.
RxResp	Number of valid EAP-response frames (other than response/identity frames) that have been received.
RxInvalid	Number of EAPOL frames that have been received and have an unrecognized frame type.
RxLenError	Number of EAPOL frames that have been received in which the packet body length field is invalid.
RxTotal	Number of valid EAPOL frames of any type that have been received.
RxVersion	Protocol version number carried in the most recently received EAPOL frame.
LastRxSrcMac	Source MAC address carried in the most recently received EAPOL frame.

Command	Description	
dot1x critical	Enables the 802.1X critical authentication on a port.	
dot1x critical eapol	Enables sending EAPOL success packets when a port is critically authorized partway through an EAP exchange.	
dot1x critical recovery delay	Sets the time interval between port reinitializations.	
dot1x critical vlan	Assigns a critically authenticated port to a specific VLAN.	
dot1x guest-vlan	Enables a guest VLAN on a per-port basis.	
Sets the maximum number of times that the switch retransmit an EAP-Request/Identity frame to the obefore restarting the authentication process.		
dot1x port-control	Enables manual control of the authorization state on a port.	
mac-address-table notification	Enables MAC address notification on a switch.	

# 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**

alarm	(Optional) Specifies the alarm status of the chassis.
status	(Optional) Specifies the operational status information.
chassis	(Optional) Specifies the operational status of the chassis.
fantray	(Optional) Specifies the status of the fan tray, and shows fan tray power consumption.
powersupply	(Optional) Specifies the status of the power supply.
supervisor	(Optional) Specifies the status of the supervisor engine.
temperature	(Optional) Specifies the current chassis temperature readings.

### 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.
12.1(12c)EW	Support for the ability to display generic environment information with the <b>show environment</b> command was added.

### **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

Power				Fan	l	
Supply	Model N	0	Type	Sta	itus	Sensor
PS1	PWR-C45	-1400AC	AC 140	0W god	od	good
PS2	none					
Power Su	upply	Max	Min	Max	Min	Absolute
(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
```

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:

	show en	vironmen	t status	5			
	Model N					tus	Fan Sensor
	PWR-C45	-1400AC	AC 140	WO C	goo	d	good 
							Absolute Maximum
PS1 PS2		0	0				1400
Power supplies needed by system : 1							
Chassis Type : WS-C4507R							
Supervisor Led Color : Green							
Fantray : good							

This example shows how to display information about the chassis:

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

Power consumed by Fantray: 50 Watts

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 pow	ersupply	
Power				Fan
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 = 2 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(19)EW	Display includes the status of storm control.

# 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
12ptguard	Enabled
gbic-invalid	Enabled
dhcp-rate-limit	Enabled
unicast-flood	Enabled
storm-control	Enabled
ilpower	Enabled
arp-inspection	Enabled
Switch#	

Command	Description
errdisable detect	Enables error-disable detection.
errdisable recovery	Configures the recovery mechanism variables.
show interfaces status	Displays the interface status or a list of interfaces in error-disabled state.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(19)EW	Display includes the status of storm control.

# **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:

Interface	Errdisable reason	Time left(sec)
Fa7/32	arp-inspect	13

Command	Description			
errdisable detect Enables error-disable detection.				
errdisable recovery	Configures the recovery mechanism variables.			
show interfaces status	Displays the interface status or a list of interfaces in error-disabled state.			

# show etherchannel

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

 $show\ ether channel\ [\mathit{channel-group}]\ \{port\text{-}channel\ |\ brief\ |\ detail\ |\ summary\ |\ port\ |\ load\text{-}balance} \\ |\ protocol\}$ 

## **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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(13)EW	Support for LACP was added to this command.

### **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:

```
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
```

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
            Ports in the group:
Port: Fa5/4
          = EC-Enbld Down Not-in-Bndl Usr-Config
Port state
Port-channel = null
                                        Psudo-agport = Po1
                      Load = 0x00
Port indx
           = 0
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
        Flags State Timers Interval Count Priority Method Ifindex
Port
Fa5/4
       d U1/S1
                           1s
                                   0
                                         128
                                                   Anv
Age of the port in the current state: 02h:33m:14s
Port: Fa5/5
Port state
          = EC-Enbld Down Not-in-Bndl Usr-Config
Gcchange = 0
                                        Psudo-agport = Po1
Port indx
                      Load = 0x00
           = 0
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
Fa5/5
       d U1/S1
                                  0
                                         128
                          1s
                                                  Any
```

```
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 Number of ports in agport = 0
                                  HotStandBy port = null
                  = 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
U-in use I-in port-channel S-suspended D-down i-stand-alone d-default
Group Port-channel Ports
    Po1(U) Fa5/4(I) Fa5/5(I)
Po2(U) Fa5/6(I) Fa5/7(I)
2
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 GC = 0x00000000 Psudo-agport = Pol
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
         d U1/S1
                              1s
                                  0
                                                       Any
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 = 0 \times 000000000 Psudo-agport = Pol
Port indx = 0 Load - 0 \times 00
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.

<...output truncated...>

Switch#
```

This example shows how to display the protocol enabled:

```
Switch# show etherchannel protocol
```

```
Channel-group listing:
-------
Group: 12
------
Protocol: PAgP

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

Command	Description
channel-group	Assigns and configures an EtherChannel interface to an EtherChannel group.
interface port-channel	Accesses or creates a port-channel interface.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(25)EW	Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.

# **Usage Guidelines**

Table 2-20 describes the fields in the **show flowcontrol** command output.

Table 2-20 show flowcontrol Command Output

Field	Description
Port	Module and port number.
Send-Flowcontrol-Admin	Flow-control administration. Possible settings: <b>on</b> indicates the local port sends flow control to the far end; <b>off</b> indicates the local port does not send flow control to the far end; <b>desired</b> indicates the local end sends flow control to the far end if the far end supports it.
Send-Flowcontrol-Oper	Flow-control operation. Possible setting: <b>disagree</b> indicates the two ports could not agree on a link protocol.
Receive-Flowcontrol-Admin	Flow-control administration. Possible settings: <b>on</b> indicates the local port requires the far end to send flow control; <b>off</b> indicates the local port does not allow the far end to send flow control; <b>desired</b> indicates the local end allows the far end to send flow control.
Receive-Flowcontrol-Oper	Flow-control operation. Possible setting: <b>disagree</b> indicates the two ports could not agree on a link protocol.
RxPause	Number of pause frames received.
TxPause	Number of pause frames transmitted.

# **Examples**

This example shows how to display the flow control status on all the Gigabit Ethernet interfaces:

#### Switch# show flowcontrol

Port	Send Flo	wControl	Receive	FlowControl	RxPause	TxPause
	admin	oper	admin	oper		
Te1/1	off	off	on	off	0	0
Te1/2	off	off	on	off	0	0
Gi1/3	off	off	desired	on	0	0
Gi1/4	off	off	desired	on	0	0
Gi1/5	off	off	desired	on	0	0
Gi1/6	off	off	desired	on	0	0
Gi3/1	off	off	desired	off	0	0
Gi3/2	off	off	desired	off	0	0
Gi3/3	off	off	desired	off	0	0
Gi3/4	off	off	desired	off	0	0
Gi3/5	off	off	desired	off	0	0
Gi3/6	off	off	desired	off	0	0
Switch#						

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

Switch#	show flow	wcontrol r	nodule 1			
Port	Send Flow	wControl	Receive H	FlowControl	RxPause	TxPause
	admin	oper	admin	oper		
Gi1/1	desired	off	off	off	0	0
Gi1/2	on	disagree	on	on	0	0
Switch#						

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

Switch#	show flo	wcontrol	interface	gigabitethe:	rnet3/4	
Port	Send Flo	wControl	Receive	FlowControl	RxPause	TxPause
	admin	oper	admin	oper		
Gi3/4 Switch#	off	off	on	on	0	0

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

#### Switch# show flowcontrol interface tengigabitethernet1/1

Port		wControl oper		FlowControl oper	RxPause	TxPause
Te1/1 Switch#	off	off	on	off	0	0

Command	Description
channel-group	Configures a Gigabit Ethernet interface to send or receive pause frames.
show interfaces status	Displays the interface status or a list of interfaces in error-disabled state.

# 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**

module	Specifies a line module.	
number	Specifies a slot or module number.	
port-group	Specifies a port-group on a switch.	

**Defaults** 

X2 mode.

**Command Modes** 

Global configuration mode

### **Command History**

Release	Modification
12.2(40)SG	Support for WS-X4606-10GE-E Twin Gigabit convertor introduced.

## **Usage Guidelines**

When a TwinGig Convertor is enabled or disabled, the number and type of ports on the linecard 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 a Supervisor Engine 6-E or 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	Te1/1-3	Gi1/7-12
1	2	Te1/4-6	Gi1/13-18
Switch#			

Command	Description
hw-module port-group	Selects either Gigabit Ethernet or Ten Gigabit Ethernet
	interfaces on your module.

# 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**

Release	Modification
12.2(25)EW	Support for this command was introduced on the Catalyst 4500 series switch.

# **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.

Command	Description
hw-module uplink select	Selects the 10-Gigabit Ethernet or Gigabit Ethernet uplinks on the Supervisor Engine V-10GE within the W-C4510R chassis.

# 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**

all	Displays information for all IDPROMs.	
chassis	Displays information for the chassis IDPROMs.	
module	Displays information for the module IDPROMs.	
mod	(Optional) Specifies the module name.	
interface int_name	Displays information for the GBIC or SFP IDPROMs.	
supervisor	Displays information for the supervisor engine IDPROMs.	
power-supply number	Displays information for the power supply IDPROMs.	
fan-tray	Displays information for the fan tray IDPROMs.	

### 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.	
12.1(12c)EW	Support for the <b>power-supply</b> , <b>fan-tray</b> , <b>clock-module</b> , and <b>mux-buffer</b> keywords was added.	
12.1(13)EW	Support for <b>interface</b> keyword was added.	
12.2(18)EW	Enhanced the <b>show idprom interface</b> output to include the hexadecimal display of the GBIC/SFP SEEPROM contents.	
12.2(25)EW	Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.	

# **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
 Engineering Bits = 0x0000
 Snmp OID = 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#
```

Switch# show idprom interface gigabitethernet1/2

= Not available

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

```
GBIC Serial EEPROM Contents:
Common Block:
 Identifier
                  = GBIC [0x1]
Extended Id
                  = Not specified/compliant with defined MOD_DEF [0x0]
                  = SC connector [0x1]
 Connector
 Transceiver
 Speed
                  = Not available [0x0]
 Media
                  = Not available [0x0]
 Technology
                  = Not available [0x0]
                 = Not available [0x0]
 Link Length
  GE Comp Codes
                  = Not available [0x0]
 SONET Comp Codes = Not available [0x0]
 Encoding
              = 8B10B [0x1]
               = 130000000 MHz
 BR, Nominal
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 \text{ 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

```
CC_BASE
                 = 0x1A
Extended ID Fields
                = Loss of Signal implemented TX_FAULT signal implemented TX_DISABLE is
Options
implemented and disables the serial output [0x1A]
BR, max = Unspecified
                 = Unspecified
BR. min
Vendor Serial No. = K1273DH
Date code = 030409
Diag monitoring = Implemented
Calibration type = Internal
Rx pwr measuremnt = 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/
SEEPROM contents (hex) size 128:
0x0000 01 00 01 00 00 00 00 00 00 00 01 0D 00 00 FF
0x0010 00 00 00 00 43 49 53 43 4F 2D 46 49 4E 49 53 41
                                                       ....CISCO-FINISA
0x0020 52 20 20 20 00 00 90 65 46 54 52 2D 30 31 31 39 R ...^PefTR-0119
0 \times 0030 2D 43 53 43 20 20 20 20 42 20 20 20 00 00 01 1A -CSC B ....
0 \texttt{x} \texttt{0040} \quad \texttt{00 1A 00 00 4B 31 32 37 33 44 48 20 20 20 20 20} \quad \dots \texttt{K1273DH}
0x0050 20 20 20 20 30 33 30 34 30 39 20 20 64 00 00 B2
                                                          030409 d..2
0x0060 29 00 02 80 22 33 38 3D C7 67 83 E8 DF 65 6A AF
                                                       )..^@"38=Gg^C._ej.
0x0070 1A 80 ED 00 00 00 00 00 00 00 00 38 23 3C 1B
                                                       .^@m....8#<.
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 :0xD0 Number of bytes used :0xB Basic Field Address Customer Field Address :0x77 Vendor Field Address :0xA7 Extended Vendor Field Address :0x100 Reserved :0x00x2 = X2Transceiver type Optical connector type :0x1 = SCBit encoding :0x1 = NRZNormal BitRate in multiple of 1M b/s :0x2848 :0x1 =10GgE Protocol Type

Standards Compliance Codes :

10GbE Code Byte 0 :0x2 =10GBASE-LR 10GbE Code Byte 1 :0x0SONET/SDH Code Byte 0 :0x0 SONET/SDH Code Byte 1 :0x0 SONET/SDH Code Byte 2 :0x0SONET/SDH Code Byte 3 :0x0 10GFC Code Byte 0 :0x010GFC Code Byte 1 :0x0 10GFC Code Byte 2 :0x0 :0x0 10GFC Code Byte 3 Transmission range in 10m :0x3E8

Fibre Type :

:0x40 =NDSF only Fibre Type Byte 0

```
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 :0xC09820
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 4F 4E 4A 30 38 32 39 30 30 34 31
 0x20: 31 30 2D 32 30 33 36 2D 30 31 20 20 41 30 31 20
Vendor Specific :
 0x30: 00 00 00 00 11 E2 69 A9 2F 95 C6 EE D2 DA B3 FD
 0x40: 9A 34 4A 24 CB 00 00 00 00 00 00 00 00 00 EF 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
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 = 0x0000000000000000
 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 = 0x0000
 Engineering Bits = 0x0000
 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
 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 = 0x0000000FFFFFFFF
Current @ 110V = -1
 Current @ 220V = -1
 StackMIB OID = 65535
```

Switch#

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
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}]

## **Syntax Description**

fastethernet mod/interface-number	(Optional) Specifies the Fast Ethernet module and interface.
gigabitethernet mod/interface-number	(Optional) Specifies the Gigabit Ethernet module and interface.
tengigabitethernet mod/interface-number	(Optional) Specifies the 10-Gigabit Ethernet module and interface.
null interface-number	(Optional) Specifies the null interface; the valid value is 0.
vlan vlan_id	(Optional) Specifies the VLAN; valid values are from 1 to 4094.
status	(Optional) Displays status information.

#### **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.	
12.1(12c)EW	Support for extended VLAN addresses was added.	
12.2(25)EW	Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.	
12.2(31)SGA	Support for auto-MDIX reflected in command output.	

# **Usage Guidelines**

The statistics are collected on a per-VLAN basis 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, you might see a difference in the duplex mode that is displayed between the **show interfaces** command and the **show running-config** commands. 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, while 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.

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

### **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
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 mcast
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
O input packets with dribble condition detected
15181 packets output, 1955836 bytes, 0 underruns
O output errors, O collisions, 3 interface resets
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
O output buffer failures, O 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 Pol)
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 mapping trunk: New 202 (VLAN0202) 303 (VLAN0303) 304
(VLAN0304) 204 (VLAN0204) 305 (VLAN0305) 306 (VLAN0306)
```

```
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 a RJ-45 port:



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 RJ45 copper ports on supported linecards including WS-X4124-RJ45, WS-X4148-RJ with hardware revision 3.0 or higher, and WS-X4232-GB-RJ with hardware revision 3.0 or higher.

```
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
  Input queue: 0/2000/0/0 (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
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 multicasts)
     0 runts, 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
     O output errors, O collisions, O interface resets
     0 babbles, 0 late collision, 0 deferred
     1 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

```
Port Name Status Vlan Duplex Speed Type Gi1/2 notconnect 1 auto 1000 1000-XWDM-RXONLY Switch#
```

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

### Switch# show interfaces status

Port	Name	Status	Vlan	Duplex	Speed Type
Te1/1		connected	1	full	10G 10GBase-LR
Te1/2		connected	1	full	10G 10GBase-LR
Switch#					

# show interfaces capabilities

To display the interface capabilities for an interface or for all the interfaces on a switch, use the **show interfaces capabilities** command.

show interfaces capabilities [{module mod}]

show interfaces [interface interface-number] capabilities

### **Syntax Description**

module mod	(Optional) Display information for the specified module only.		
interface	(Optional) Interface type; valid values are <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , and <b>port-channel</b> .		
interface-number	(Optional) Port number.		

#### Defaults

This command has no default settings.

## **Command Modes**

Privileged EXEC mode

### **Command History**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(25)EW	Support for the 10-Gigabit Ethernet interface was introduced on the Catalyst 4500 series switch.
12.2(31)SGA	Support for auto-MDIX reflected in command output.

### **Usage Guidelines**

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the chassis and module used. For example, if you have a 48-port 10/100-Mbps Fast Ethernet RJ-21 (telco connector) switching module installed in a Catalyst 4507 chassis, valid values for the slot number are from 2 to 13 and valid values for the port number are 1 to 48.

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

## **Examples**

This example shows how to display the interface capabilities for a module:

```
Switch# show interfaces capabilities module 1
GigabitEthernet1/1
 Model:
                       WS-X4516-Gbic
  Type:
                       Unsupported GBIC
  Speed:
                       1000
  Duplex:
                       ful1
 Trunk encap. type: 802.1Q, ISL
  Trunk mode:
                       on, off, desirable, nonegotiate
  Channel:
                       yes
  Broadcast suppression:percentage(0-100), hw
 Flowcontrol: rx-(off,on,desired),tx-(off,on,desired)
VLAN Membership: static, dynamic
 Fast Start:
                      ves
  Queuing:
                      rx-(N/A), tx-(4q1t, Sharing/Shaping)
  CoS rewrite:
                      yes
  ToS rewrite:
                       yes
  Inline power:
                       no
  SPAN:
                       source/destination
  UDLD
                        yes
  Link Debounce:
                       no
 Link Debounce Time: no
  Port Security
                       yes
 Dot1x
                       yes
GigabitEthernet1/2
 Model:
                       WS-X4516-Gbic
 Type:
                       Unsupported GBIC
 Speed:
                       1000
 Duplex:
                       full
  Trunk encap. type:
                       802.1Q, ISL
 Trunk mode:
                       on, off, desirable, nonegotiate
 Channel:
                       yes
 Broadcast suppression:percentage(0-100), hw
  Flowcontrol: rx-(off,on,desired),tx-(off,on,desired)
 VLAN Membership:
                     static, dynamic
  Fast Start:
                      yes
  Oueuina:
                       rx-(N/A), tx-(4q1t, Sharing/Shaping)
  CoS rewrite:
                       yes
  ToS rewrite:
                       yes
  Inline power:
                       no
  SPAN:
                       source/destination
 UDLD
                       ves
 Link Debounce:
                      no
  Link Debounce Time: no
  Port Security
                       yes
  Dot1x
                        yes
Switch#
```

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

```
Switch# show interfaces tengigabitethernet1/1 capabilities
TenGigabitEthernet1/1
 Model:
                       WS-X4517-X2
 Type:
                       10GBase-LR
                       10000
 Speed:
 Duplex:
                       full
 Trunk encap. type: 802.1Q, ISL
 Trunk mode:
                   on,off,desirable,nonegotiate
 Channel:
                       yes
 Broadcast suppression: percentage(0-100), hw
 Flowcontrol: rx-(off,on), tx-(off,on)
 VLAN Membership:
                       static, dynamic
 Fast Start:
                       yes
```

```
Queuing:
                        rx-(N/A), tx-(1p3q1t, Sharing/Shaping)
                        yes
 CoS rewrite:
 ToS rewrite:
                        ves
 Inline power:
                        no
                        source/destination
 SPAN:
 UDLD:
                        yes
 Link Debounce:
                        no
 Link Debounce Time:
                        no
 Port Security:
                        ves
 Dot1x:
                        yes
 Maximum MTU:
                        9198 bytes (Jumbo Frames)
 Multiple Media Types: no
 Diagnostic Monitoring: N/A
Switch#
```

This example shows how to display the interface capabilities for Gigabit Ethernet interface 1/1:

#### Switch# show interfaces gigabitethernet1/1 capabilities

```
GigabitEthernet1/1
 Model:
                       WS-X4014-Gbic
                       No Ghic
 Type:
 Speed:
                       1000
 Duplex:
                       full
 Trunk encap. type:
                      802.1Q, ISL
 Trunk mode:
                      on, off, desirable, nonegotiate
 Channel:
                      ves
 Broadcast suppression:percentage(0-100), hw
 Flowcontrol: rx-(off,on,desired),tx-(off,on,desired)
 VLAN Membership:
                     static, dynamic
 Fast Start:
                     yes
 Oueuing:
                      rx-(N/A), tx-(4q1t, Sharing/Shaping)
 CoS rewrite:
                       ves
  ToS rewrite:
                       yes
 Inline power:
                       no
 SPAN:
                       source/destination
 UDLD:
                       ves
 Link Debounce:
 Link Debounce Time: no
 Port Security:
                       yes
 Dot1x:
                       yes
 MTU Supported:
                       jumbo frames, baby giants
Switch#
```

This example shows how to display the interface capabilities for Fast Ethernet interface 3/1:

## Switch# show interfaces fastethernet3/1 capabilities

```
FastEthernet3/1
 Model:
                      WS-X4148-RJ-RJ-45
                      10/100BaseTX
 Type:
                      10,100,auto
 Speed:
                     half,full,auto
 Duplex:
 Trunk encap. type: 802.1Q,ISL
 Trunk mode: on,off,desirable,nonegotiate
                      yes
 Channel:
 Broadcast suppression:percentage(0-100), sw
                rx-(none),tx-(none)
 Flowcontrol:
 VLAN Membership:
                      static, dynamic
 Fast Start:
                      ves
 Oueuina:
                      rx-(N/A), tx-(4q1t, Shaping)
 CoS rewrite:
                      yes
 ToS rewrite:
                      yes
 Inline power:
                      no
                      source/destination
 SPAN:
  UDLD:
                      ves
```

```
Link Debounce: no
Link Debounce Time: no
Port Security: yes
Dot1x: yes
MTU Supported: no jumbo frames, baby giants
Switch#
```

This example shows how to verify that the auto-MDIX configuration is supported on a port:

#### Switch# show interfaces fastethernet6/3 capabilities

```
FastEthernet6/3
 Model:
                       WS-X4232-GB-RJ-RJ-45
                        10/100BaseTX
 Type:
 Speed:
                        10,100,auto
 Duplex:
                       half, full, auto
 Auto-MDIX
                       yes
 Trunk encap. type: 802.1Q, ISL
Trunk mode: on, off, desirable, nonegotiate
 Channel:
                       yes
 Broadcast suppression: percentage(0-100), hw
 Flowcontrol: rx-(none),tx-(none)
 VLAN Membership:
                      static, dynamic
 Fast Start:
                      yes
 Queuing:
                       rx-(N/A), tx-(1p3q1t, Sharing/Shaping)
 CoS rewrite:
                       yes
 ToS rewrite:
                       yes
 Inline power:
                      no
 SPAN:
                      source/destination
 UDLD:
                       yes
 Link Debounce:
                      no
 Link Debounce Time: no
 Port Security:
                       yes
 Dot1x:
                       yes
 Maximum MTU:
                       1552 bytes (Baby Giants)
 Multiple Media Types: no
 Diagnostic Monitoring: N/A
Switch#
```

Command	Description
show interfaces counters	Displays the traffic on the physical interface.

# 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**

all	(Optional) Displays all the interface counters including errors, trunk, and detail.	
detail	(Optional) Displays the detailed interface counters.	
errors	(Optional) Displays the interface error counters.	
storm-control	(Optional) Displays the number of packets discarded due to suppression on the interface.	
trunk	(Optional) Displays the interface trunk counters.	
module mod	(Optional) Limits the display to interfaces on a specific module.	

### 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.
12.1(19)EW	Support for storm control.
12.2(18)EW	Support for the display of total suppression discards.

# **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:

 ${\tt Switch \# \ \, show \ \, interfaces \ \, counters \ \, errors \ \, module \ \, 1}}$ 

Port	Align-Err	FCS-Err	Xmit-Err	Rcv-Err Un	derSize		
Gi1/1	0	0	0	0	0		
Gi1/2	0	0	0	0	0		
Port	Single-Col Mul	lti-Col La	ate-Col Exces	ss-Col Carri	-Sen	Runts	Giants
Gi1/1	0	0	0	0	0	0	0
Gi1/2	0	0	0	0	0	0	0
Switch#							

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

Switch# show interfaces counters module 1

Port	InOctets	InUcastPkts	InMcastPkts	InBcastPkts
Gi1/1	0	0	0	0
Gi1/2	0	0	0	0
Port	OutOctets	OutUcastPkts	OutMcastPkts	OutBcastPkts
Gi1/1	0	0	0	0
Gi1/2	0	0	0	0
Switch#				

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

Switch# show interfaces counters trunk module 1

Port	TrunkFramesTx	TrunkFramesRx	WrongEncap
Gi1/1	0	0	0
Gi1/2	0	0	0
Switch#			

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

Switch# show interfaces counters storm-control

Multicast Suppression : Enabled Port.  ${\tt BcastSuppLevel \ TotalSuppressionDiscards}$ 10.00%

Fa5/35 Switch#

# **Related Commands**

Command	Description
show interfaces capabilities	Displays the interface capabilities for an interface or for all the interfaces on a switch.

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# show interfaces description

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

show interfaces [interface] description

•	-		
Syntax	Heer	rın	ntion
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interface (Optional) Type of interface.

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.

## **Examples**

This example shows how to display information for all interfaces:

#### Switch# show interfaces description

Interface	Status	Protocol	Description
PO0/0	admin down	down	First interface
PO0/1	admin down	down	
Gi1/1	up	up	GigE to server farm
Switch#			

Command	Description
description (refer to Cisco IOS	Includes a specific description about the digital signal
documentation)	processor (DSP) interface.

# 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**

Release	Modification
12.2(18)EW	Support for this command was introduced on the Catalyst 4500 series switch.

# **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	D	own 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	Descri	ption

module mod	(O	ptional	) ]	Limits	the	display	to	interfaces	on	a s	pecific	module.

### Defaults

This command has no default settings.

### **Command Modes**

EXEC mode

# **Command History**

Release	Modification
12.1(13)EW	Support for this command was introduced on the Catalyst 4500 series switch.

# **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	>	

Command	Description
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 **show interfaces private-vlan mapping** command.

show interfaces private-vlan mapping [active]

•			
<b>~</b> 1	/ntav	Descri	ntınn
•	IIIUA	DUSUII	puon

active	(Optional)	) Displays	active	interfaces	only.
ucui c	Optional	Dispings	active	miceriaces	OIII,

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 displays SVI information only.

## **Examples**

This example shows how to display PVLAN mapping information:

## ${\tt Switch \#} \ \ \textbf{show interfaces private-vlan mapping}$

Interface	Secondary	VLAN	Type
vlan2	301		isolated
vlan2	302		isolated
Switch#			

Command	Description
private-vlan	Configures private VLANs and the association between a private VLAN and a secondary VLAN.
private-vlan mapping	Creates a mapping between the primary and the secondary VLANs so that both share the same primary VLAN SVI.

# 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}]

## **Syntax Description**

err-disabled	(Optional) Displays interfaces in error-disabled state.		
inactive	(Optional) Displays interfaces in inactive state.		
module module	(Optional) Displays interfaces on a specific module.		

### **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(40)SG	Support for WS-X4606-10GE-E Twin Gigabit convertor introduced.

### **Examples**

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

### Switch# show interfaces status

Port	Name	Status	Vlan	Duplex	Speed	Type
Gi1/1		disabled	routed	ful1	1000	missing
Gi1/2		notconnect	1	ful1	1000	unknown (4)
Fa5/1		disabled	routed	auto	auto	10/100BaseTX
Fa5/2		disabled	routed	auto	auto	10/100BaseTX
Fa5/3		disabled	routed	auto	auto	10/100BaseTX
Fa5/4		disabled	routed	auto	auto	10/100BaseTX
Fa5/15		disabled	routed	auto	auto	10/100BaseTX
Fa5/16		disabled	routed	auto	auto	10/100BaseTX
Fa5/17		disabled	routed	auto	auto	10/100BaseTX
Switch#						

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

## Switch# show interfaces status err-disabled

Port	Name	Status	Reason
Fa9/4		notconnect	link-flap

informational error message when the timer expires on a cause

 $5d04h:\PM-SP-4-ERR\_RECOVER:$  Attempting to recover from link-flap err-disable state on Fa9/4 Switch#

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

```
Switch# show interfaces status module 1
Port Name Status Vlan Duplex Speed Type
Te1/1 inactive 1 full 10G No X2
Te1/2 inactive 1 full 10G No X2
Te1/3 inactive 1 full 10G No X2
Te1/4 notconnect 1 full 10G No X2
Te1/5 notconnect 1 full 10G No X2
Te1/6 notconnect 1 full 10G No X2
Gi1/7 notconnect 1 full 1000 No Gbic
Gi1/8 notconnect 1 full 1000 No Gbic
Gi1/9 notconnect 1 full 1000 No Gbic
Gi1/10 notconnect 1 full 1000 No Gbic
Gil/11 notconnect 1 full 1000 No Gbic
Gi1/12 notconnect 1 full 1000 No Gbic
Gi1/13 inactive 1 full 1000 No Gbic
Gi1/14 inactive 1 full 1000 No Gbic
Gi1/15 inactive 1 full 1000 No Gbic
Gi1/16 inactive 1 full 1000 No Gbic
Gi1/17 inactive 1 full 1000 No Gbic
Gi1/18 inactive 1 full 1000 No Gbic
Switch#
```

Command	Description
errdisable detect	Enables error-disable detection.
hw-module port-group	Selects either Gigabit Ethernet or Ten Gigabit Ethernet interfaces on your module.
show errdisable recovery	Displays error disable recovery timer information.

## show interfaces switchport

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

**show interfaces** [interface-id] **switchport** [**module** mod]

### **Syntax Description**

interface-id	(Optional) Interface ID for the physical port.
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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(19)EW	Support for per-interface display.
12.2(18)EW	Support for displaying the status of native VLAN tagging in the command output.

### **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

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 trunk promiscuous
Operational Mode: private-vlan trunk promiscuous
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#
```

Command	Description
show interfaces capabilities	Displays the interface capabilities for an interface or for all the interfaces on a switch.
show interfaces counters	Displays the traffic on the physical interface.

## show interfaces transceiver

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

show interfaces  $\{\{[int\_name] \text{ transceiver } \{[detail]\} \mid \{transceiver [module <math>mod]\}\}$ 

### **Syntax Description**

int_name	(Optional) Interface.
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**

Release	Modification
12.1(20)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(18)EW	Support for the calibration keyword was withdrawn.

### **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.

Ontical

### **Examples**

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

#### Switch# show interfaces transceiver

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

				Optical	Optical
	Temperature	Voltage	Current	Tx Power	Rx Power
Port	(Celsius)	(Volts)	(mA)	(dBm)	(dBm)
Gi1/1	48.1	3.30	0.0	8.1 ++	N/A
Gi1/2	33.0	3.30	1.8	-10.0	-36.9
Gi2/1	43.7	5.03	50.6 +	-16.7	N/A
Gi2/2	39.2	5.02	25.7	0.8	N/A
Switch#					



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:

#### Switch# show interfaces transceiver detail

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

	Temperature (Celsius)	(Celsius)	Threshold (Celsius)	Threshold (Celsius)	Threshold (Celsius)
	48.1		100.0		0.0
Gi1/2	34.9	100.0	100.0	0.0	0.0
Gi2/1	43.5	70.0	60.0	5.0	0.0
Gi2/2	39.1	70.0	60.0	5.0	0.0
		High Alarm	-		
	Voltage	Threshold	Threshold	Threshold	Threshold
Port	(Volts)	(Volts)			
Gi1/1	3.30		6.50		
Gi1/2	3.30	6.50	6.50	N/A	N/A
Gi2/1	5.03	5.50	5.25	4.75	4.50
Gi2/2	5.02	5.50	5.25	4.75	4.50
		High Alarm	High Warn	Low Warn	Low Alarm
	Current	Threshold	Threshold	Threshold	Threshold
Port	(milliamperes)	(mA)	(mA)	, ,	, ,
Gi1/1	0.0	130.0			
Gi1/2	1.7	130.0	130.0	N/A	N/A
Gi2/1	50.6 +			10.0	5.0
Gi2/2	25.8	60.0	40.0	10.0	5.0

Port	Optical Transmit Power (dBm)	High Alarm Threshold (dBm)	Threshold	Threshold	
Gi1/1	8.1 ++	8.1	8.1	N/A	N/A
Gi1/2	-9.8	8.1	8.1	N/A	N/A
Gi2/1	-16.7 (-13.0)	3.4	3.2	-0.3	-0.5
Gi2/2	0.8 ( 5.1)	3.4	3.2	-0.3	-0.5
	Optical Receive Power	High Alarm Threshold	9		Low Alarm Threshold
Port	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
Gi1/1	N/A	8.1	8.1	N/A	N/A
Gi1/2	-30.9	8.1	8.1	N/A	N/A
Gi2/1	N/A (-28.5)	5.9	-6.7	-28.5	-28.5
Gi2/2	N/A (-19.5)	5.9	-6.7	-28.5	-28.5
Switch#					

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. ++ : high alarm, + : high warning, - : low warning, -- : low alarm. NA or N/A: not applicable, Tx: transmit, Rx: receive. mA: milliamperes, dBm: decibels (milliwatts).
```

				Optical	Optical
	Temperature	Voltage	Current	Tx Power	Rx Power
Port	(Celsius)	(Volts)	(mA)	(dBm)	(dBm)
Gi2/1	43.7	5.03	50.6 +	-16.7	N/A
Gi2/2	39.2	5.02	25.7	0.8	N/A
Switch#					

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. ++ : high alarm, + : high warning, - : low warning, -- : low alarm. A2D readouts (if they differ), are reported in parentheses. The threshold values are calibrated.
```

Port	Temperature (Celsius)	High Alarm Threshold (Celsius)	High Warn Threshold (Celsius)	Low Warn Threshold (Celsius)	Low Alarm Threshold (Celsius)
Gi2/1 Gi2/2	43.5 39.1	70.0 70.0	60.0	5.0 5.0	0.0
Port	Voltage (Volts)	High Alarm Threshold (Volts)	High Warn Threshold (Volts)	Low Warn Threshold (Volts)	Low Alarm Threshold (Volts)
Gi2/1 Gi2/2	5.03 5.02	5.50 5.50	5.25 5.25	4.75 4.75	4.50 4.50

		Current		High Alarm Threshold	-	Low Warn Threshold	
		(milliamperes)					
(	Gi2/1	50.6 +		60.0	40.0	10.0	5.0
(	Gi2/2	25.8		60.0	40.0	10.0	5.0
		Optical		-	-		
		Transmit Power		Threshold	Threshold	Threshold	Threshold
		(dBm)					
(	Gi2/1	-16.7 (-13.0)	_	3.4	3.2	-0.3	-0.5
(	Gi2/2	0.8 ( 5.1)		3.4	3.2	-0.3	-0.5
		Optical		High Alarm	High Warn	Low Warn	Low Alarm
		Receive Power		Threshold	Threshold	Threshold	Threshold
	Port	(dBm)		, ,		(dBm)	
(	Gi2/1	N/A (-28.5)					
(	Gi2/2	N/A (-19.5)		5.9	-6.7	-28.5	-28.5
Swite	ch#						

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.
++ : high alarm, + : high warning, - : low warning, -- : low alarm.

NA or N/A: not applicable, Tx: transmit, Rx: receive.
mA: milliamperes, dEm: decibels (milliwatts).
```

				Optical	Optical
	Temperature	9		Tx Power	
Port	(Celsius)	(Volts)	(mA)	(dBm)	(dBm)
Gi2/1	43.7	5.03	50.6 +	-16.7	N/A
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.
++ : high alarm, + : high warning, - : low warning, -- : low alarm.
A2D readouts (if they differ), are reported in parentheses.
The threshold values are calibrated.
```

Port	Temperature (Celsius)	High Alarm Threshold (Celsius)	High Warn Threshold (Celsius)	Low Warn Threshold (Celsius)	Low Alarm Threshold (Celsius)
Gi2/1	43.5	70.0	60.0	5.0	0.0
Port	Voltage (Volts)	High Alarm Threshold (Volts)	High Warn Threshold (Volts)	Low Warn Threshold (Volts)	Low Alarm Threshold (Volts)
Gi2/1	5.03	5.50	5.25	4.75	4.50

Port	Current (milliamperes)	High Alarm Threshold (mA)	Threshold	Low Warn Threshold (mA)	
Gi2/1	50.6 +	60.0	40.0	10.0	5.0
Port	Optical Transmit Power (dBm)	High Alarm Threshold (dBm)	Threshold	Low Warn Threshold (dBm)	Threshold
Gi2/1	-16.7 (-13.0)	3.4	3.2	-0.3	-0.5
	Optical Receive Power	High Alarm Threshold	High Warn Threshold	Low Warn Threshold	
Port 	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
Gi2/1 Switch#	N/A (-28.5)	5.9	-6.7	-28.5	-28.5

Command	Description
show idprom	Displays the IDPROMs for the chassis.
show interfaces status	Displays the interface status or a list of interfaces in error-disabled state.

## show interfaces trunk

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

show interfaces trunk  $[module \ mod]$ 

•		_		
<b>~</b> 1	<b>/ntax</b>	11000	rin	tini

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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

### **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:

Switch# show interfaces trunk module 5

Port	Mode	Encapsulation	Status	Native vlan
Fa5/1	routed	negotiate	routed	1
Fa5/2	routed	negotiate	routed	1
Fa5/3	routed	negotiate	routed	1
Fa5/4	routed	negotiate	routed	1
Fa5/5	routed	negotiate	routed	1
Fa5/6	off	negotiate	not-trunking	10
Fa5/7	off	negotiate	not-trunking	10
Fa5/8	off	negotiate	not-trunking	1
Fa5/9	desirable	n-isl	trunking	1
Fa5/10	desirable	negotiate	not-trunking	1
Fa5/11	routed	negotiate	routed	1
Fa5/12	routed	negotiate	routed	1
Fa5/48	routed	negotiate	routed	1
Port	Vlans allowed	d on trunk		
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	1-1005			

```
Fa5/10
         none
Fa5/11
         none
Fa5/12
         none
Fa5/48
         none
         Vlans allowed and active in management domain
Port
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
02,850,917,999,1002-1005
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
         1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
Fa5/9
02,850,917,999,1002-1005
Fa5/10
        none
Fa5/11
         none
Fa5/48
         none
Switch#
```

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
      Vlans allowed on trunk
Port.
Fa5/9
       1-1005
Port
      Vlans allowed and active in management domain
      Fa5/9
02,850,917,999,1002-1005
Port
      Vlans in spanning tree forwarding state and not pruned
Fa5/9
       02,850,917,999,1002-1005
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 <b>statistics</b> keyword, displays the statistics for the selected range of VLANs. Without the <b>statistics</b> 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**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

### 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 Fa	ilures
3	31753	0		0
Vlan	Dest MAC Failu	res IP Valid	lation Failures	
3 Switch#		0	0	

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

Vlan	Forwarded	Dropped	DHCP Drops	ACL Drops
1	0	0	0	0
2	0	0	0	0
3	68322	220356	220356	0
4	0	0	0	0
100	0	0	0	0
101	0	0	0	0
1006	0	0	0	0
1007	0	0	0	0
Vlan	DHCP Permits	ACL Permits	Source MAC Fa	ilures
1	0	0		0
2	0	0		0
3	68322	0		0
4	0	0		0
100	0	0		0
101	0	0		0
1006	0	0		0
1007	0	0		0
Vlan	Dest MAC Failures		ation Failures	
1	0		0	
2	0		0	
3	0		0	
4	0		0	
100	0		0	
101	0		0	
1006	0		0	
1007	0		0	
Switch#	v		Ü	

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

DW120011   D110   1	.p u-pp-000-0		
Interface	Trust State	Rate (pps)	Burst Interval
Fa6/1	Untrusted	20	5
Switch#			

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

Switch# show i	p 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#		

Command	Description
arp access-list	Defines an ARP access list or adds clauses at the end of a predefined list.
clear ip arp inspection log	Clears the status of the log buffer.
show ip arp inspection log	Displays the status of the log buffer.

# 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**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

### **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#

Command	Description
arp access-list	Defines an ARP access list or adds clauses at the end of a predefined list.
clear ip arp inspection log	Clears the status of the log buffer.

## 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**

vlan_num	Number of the VLAN.
detail	(Optional) Displays detailed information.

#### **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.

### **Examples**

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

Switch# show ip ce	f 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
Cwitch#		

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**

Release	Modification
12.1(12c)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(25)EWA	Support for option 82 on untrusted ports was added.

### **Examples**

This example shows how to display the DHCP snooping configuration:

Switch# show ip dhcp snooping

Switch DHCP snooping is enabled

 ${\tt DHCP}$  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#

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

# show ip dhcp snooping binding

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**

Release	Modification
12.1(12c)EW	Support for this command was introduced on the Catalyst 4500 series switch.

### **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

MacAddress	IP Address	Lease (seconds)	Type	VLAN	Interface
0000.0100.0201 Switch#	172.100.101.10	2 1600	dhcp-snooping	100	FastEthernet3/1

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 Switch#	55.5.5.2	479	dhcp-snooping	99	FastEthernet6/36

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)	Туре	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 Switch#	10.0.0.1	1600	dhcp-snooping	100	FastEthernet3/1

Table 2-21 describes the fields in the **show ip dhcp snooping** command output.

### Table 2-21 show ip dhcp snooping Command Output

Field	Description
Mac Address	Client hardware MAC address.
IP Address	Client IP address assigned from the DHCP server.
Lease (seconds)	IP address lease time.
Туре	Binding type; statically configured from CLI or dynamically learned.
VLAN	VLAN number of the client interface.
Interface	Interface that connects to the DHCP client host.

Command	Description
ip dhcp snooping information option	Enables DHCP option 82 data insertion.
ip dhcp snooping limit rate	Configures the number of the DHCP messages that an interface can receive per second.
ip dhcp snooping trust	Enables DHCP snooping on a trusted VLAN.
ip dhcp snooping vlan	Enables DHCP snooping on a VLAN or a group of VLANs.
ip igmp snooping	Enables IGMP snooping.
ip igmp snooping vlan	Enables IGMP snooping for a VLAN.

# 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**

detail	(Optional)	Provides additional	operating state and	statistics information.
--------	------------	---------------------	---------------------	-------------------------

#### 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.
12.1(19)EW	Added support of state and statistics information.

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

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

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 Succeded Time : None
Last Failed Time: 17:14:25 UTC Sat Jul 7 2001
Last Failed Reason : Unable to access URL.
Total Attempts
                          21 Startup Failures :
                                                        0
Successful Transfers :
                          0 Failed Transfers :
                                                      2.1
Successful Reads :
                          0 Failed Reads :
Successful Writes :
                          O Failed Writes :
                                                       21
                           0
Media Failures :
First successful access: Read
Last ignored bindings counters :
Binding Collisions : 0
Invalid interfaces : 0
                                 Expired leases
                                                           0
                                 Unsupported vlans :
Parse failures
                   :
                           0
Last Ignored Time : None
Total ignored bindings counters:
Binding Collisions : 0
                                Expired leases
                                                           0
Invalid interfaces : 0
Parse failures : 0
                                Unsupported vlans :
```

## **Related Commands**

Switch#

Command	Description
ip dhcp snooping	Globally enables DHCP snooping.
ip dhcp snooping database	Stores the bindings that are generated by DHCP snooping.
ip dhcp snooping information option	Enables DHCP option 82 data insertion.
ip dhcp snooping limit rate	Configures the number of the DHCP messages that an interface can receive per second.
ip dhcp snooping trust	Enables DHCP snooping on a trusted VLAN.
ip dhcp snooping vlan	Enables DHCP snooping on a VLAN or a group of VLANs.

## 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**

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

### Defaults

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

### **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.
12.1(12c)EW	Added support for extended VLAN addresses.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

### **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#

Command	Description	
clear ip igmp group	Deletes the IGMP group cache entries.	
show ip igmp snooping mrouter	Displays information on the dynamically learned and manually configured multicast switch interfaces.	

# 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**

Release	Modification
12.1(11b)EW	Support for this command was introduced on the Catalyst 4500 series switch.

### **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
```

Command	Description
ip igmp profile	Creates an IGMP profile.

# 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**

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

## **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
TCN solicit query
                          : Enabled
                           : Disabled
TCN flood query count
                           : 2
Vlan 1:
IGMP snooping
                                 : Enabled
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
Switch>
```

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

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

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

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

Vlan	Group	Version	Ports
2	224.0.1.40 224.2.2.2	v3 v3	Router Fa6/2
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 $\,$

Vlan	Group	Host Type	Ports	
1	229.2.3.4	v3	fa2/1 fa2/3	
1	224.2.2.2	v3	Fa6/2	
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

Vlan	Group	Version	Ports
10	226.6.6.7	v3	Fa7/13, Fa7/14
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

SourceIP	Expires	Uptime	Inc	Hosts	Exc	Hosts
2.0.0.1	00:03:04	00:03:48	2		0	
2.0.0.2	00:03:04	00:02:07	2		0	
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
```

Host (MAC/IP)	Filter mode	Expires	Uptime	# Sources
175.1.0.29	INCLUDE	stopped	00:00:51	2
175.2.0.30	INCLUDE	stopped	00:04:14	2
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>
```

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

Release	Modification
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

Source/Group	Interface	Reporter	Uptime Last-Join/	Last-Leave
40.0.0.1/224.1.1.1	Fa7/37		00:00:04 00:00:04 /	
40.0.0.2/224.1.1.1	Fa7/37	0002.fd80.f770	00:00:17 00:00:17 /	
40.0.0.3/224.1.1.1	Fa7/36	20.20.20.20	00:00:04 00:00:04 /	
40.0.0.4/224.1.1.1	Fa7/35	20.20.20.210	00:00:17 00:00:17 /	
40.0.0.5/224.1.1.1	Fa7/37	0002.fd80.f770	00:00:17 00:00:17 /	

Switch# clear ip igmp snooping membership vlan 20 Switch#

Command	Description
clear ip igmp snooping membership	Clears the explicit host tracking database.
ip igmp snooping vlan explicit-tracking	Enables per-VLAN explicit host tracking.
show ip igmp snooping	Displays information on dynamically learned and manually configured VLAN switch interfaces.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(19)EW	Added support for extended VLAN addresses.

### **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	S			
1		Gi1	1/1,G	i2/1,Fa3/	48,Switch	n	
Switch#							

Command	Description
ip igmp snooping vlan mrouter	Statically configures a Layer 2 interface as a multicast router interface for a VLAN.
show ip igmp interface	Displays the information about the IGMP-interface status and configuration.
show mac-address-table multicast	Displays information about the multicast MAC address 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 V	LAN; 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(12c)EW	Support for extended addressing was added.

### **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:

```
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
```

Switch# show ip igmp snooping vlan 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#

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

type	(Optional) Interface type.
number	(Optional) Interface number.

#### Defaults

This command has no default settings.

#### **Command Modes**

**EXEC** 

### **Command History**

Release	Modification
12.2(25)EW	Extended to include the 10-Gigabit Ethernet interface.

### **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 2-22 describes the fields that are shown in the example.

Table 2-22 show ip interface Field Descriptions

Field	Description
Ethernet0 is up	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.
line protocol is up	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.
Internet address and subnet mask	IP address and subnet mask of the interface.
Broadcast address	Broadcast address.
Address determined by	Status of how the IP address of the interface was determined.
MTU	MTU value that is set on the interface.
Helper address	Helper address, if one has been set.
Secondary address	Secondary address, if one has been set.
Directed broadcast forwarding	Status of directed broadcast forwarding.
Multicast groups joined	Multicast groups to which this interface belongs.
Outgoing access list	Status of whether the interface has an outgoing access list set.
Inbound access list	Status of whether the interface has an incoming access list set.

Table 2-22 show ip interface Field Descriptions (continued)

Field	Description
Proxy ARP	Status of whether Proxy Address Resolution Protocol (ARP) is enabled for the interface.
Security level	IP Security Option (IPSO) security level set for this interface.
Split horizon	Status of split horizon.
ICMP redirects	Status of the redirect messages on this interface.
ICMP unreachables	Status of the unreachable messages on this interface.
ICMP mask replies	Status of the mask replies on this interface.
IP fast switching	Status of whether fast switching has been enabled for this interface. Fast switching is typically enabled on serial interfaces, such as this one.
IP SSE switching	Status of the IP silicon switching engine (SSE).
Router Discovery	Status of the discovery process for this interface. It is typically disabled on serial interfaces.
IP output packet accounting	Status of IP accounting for this interface and the threshold (maximum number of entries).
TCP/IP header compression	Status of compression.
Probe proxy name	Status of whether the HP Probe proxy name replies are generated.
WCCP Redirect outbound is enabled	Status of whether packets that are received on an interface are redirected to a cache engine.
WCCP Redirect exclude is disabled	Status of whether packets that are targeted for an interface are excluded from being redirected to a cache engine.
Netflow Data Export (hardware) is enabled	NDE hardware flow status on the interface.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(40)SG	Support for command introduced on the Supervisor Engine 6-E and Catalyst 4900M chassis.

# **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 olist 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, 2113788/15000/0 bytes
  Vlan7 (F NS)
  Vlan100 (A)
(*, 239.193.100.70), flags ()
   Packets: 1/0/0, 1500/0/0 bytes
Switch#
```

Command	Description
clear ip mfib counters	Clears the global MFIB counters and the counters for all active MFIB routes.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **Examples**

This example shows how to display all currently active fast-drop entries and whether fast drop is enabled.

Switch# show ip mfib fasttdrop
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#

Command	Description
clear ip mfib fastdrop	Clears all the MFIB fast-drop entries.

# 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**

summary	(Optional) Displays a one-line, abbreviated summary of each entry in the IP multicast routing table.
static	(Optional) Displays the static multicast routes.
pruned	(Optional) Displays the pruned routes.
count	(Optional) Displays the route and packet count information.
kbps interface_type num	(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.
active	(Optional) Displays the rate that active sources are sending to multicast groups.
host_address source	(Optional) IP address or name of a multicast source.
host_name	(Optional) Name or IP address as defined in the DNS hosts table.
interface_type slot/port	(Optional) Interface type and number of the slot and port; valid values for <i>interface type</i> are <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>null</b> , and <b>vlan</b> .

# 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(25)EW	Added support for the 10-Gigabit Ethernet interface.	

# **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
(132.206.72.28, 224.2.136.89), 00:14:31/00:01:40, flags:CJT
  Incoming interface: GigabitEthernet4/8, RPF nbr 10.15.1.20, RPF-MFD
Outgoing interface list:Null
Switch#
```

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, (sdr.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 2-23 describes the fields shown in the output.

Table 2-23 show ip mroute Field Descriptions

Field	Description
Flags:	Information about the entry.
D - Dense	Entry is operating in dense mode.
S - Sparse	Entry is operating in sparse mode.
s - SSM Group	Entry is a member of an SSM group.
C - Connected	Member of the multicast group is present on the directly connected interface.
L - Local	Switch is a member of the multicast group.
P - Pruned	Route has been pruned. This information is retained in case a downstream member wants to join the source.
R - Rp-bit set	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.
F - Register flag	Status of the software; indicates if the software is registered for a multicast source.
T - SPT-bit set	Status of the packets; indicates if the packets been received on the shortest path source tree.

Table 2-23 show ip mroute Field Descriptions (continued)

Field	Description
J - Join SPT	For (*, 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 (*, 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.
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 2-23 show ip mroute Field Descriptions (continued)

Field	Description
RP	Address of the RP switch. For switches and access servers operating in sparse mode, this address is always 0.0.0.0.
flags:	Information about the entry.
Incoming interface	Expected interface for a multicast packet from the source. If the packet is not received on this interface, it is discarded.
RPF neighbor	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.
DVMRP or Mroute	Status of whether the RPF information is obtained from the DVMRP routing table or the static mroutes configuration.
Outgoing interface list	Interfaces through which packets are forwarded. When the <b>ip pim nbma-mode</b> command is enabled on the interface, the IP address of the PIM neighbor is also displayed.
Ethernet0	Name and number of the outgoing interface.
Next hop or VCD	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.
Forward/Dense	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).
Forward/Sparse	Sparse mode interface is in forward mode.
time/time (uptime/expiration time)	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.

Command	Description
<b>ip multicast-routing</b> (refer to Cisco IOS documentation)	Enables IP multicast routing.
ip pim (refer to Cisco IOS documentation)	Enables Protocol Independent Multicast (PIM) on an interface.

# 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**

ip-address	(Optional) Binding IP address.	
mac-address	(Optional) Binding MAC address.	
dhcp-snooping	(Optional) DHCP-snooping type binding.	
static	(Optional) Statically configured binding.	
vlan vlan-id	(Optional) VLAN number.	
interface interface-name	(Optional) Binding interface.	

#### **Defaults**

Displays both static and DHCP snooping bindings.

#### **Command Modes**

Privileged EXEC mode

# **Command History**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

## **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
00:00:00:0A:00:0B	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 0000.000A.000B static vlan 10 interface Fa6/10

 show ip source binding 11.0.0.1 0000.000A.000B static vlan 10 interface Fa6/10

 MacAddress
 IpAddress
 Lease(sec)
 Type
 VLAN
 Interface

 00:00:00:00:00:00:00:00
 11.0.0.1
 infinite
 static
 10
 FastEthernet6/10

 Switch#

Command	Description
ip source binding	Adds or deletes a static IP source binding entry.

# 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**

**interface** *interface\_num* (Optional) Specifies an interface.

**Defaults** 

This command has no default settings.

**Command Modes** 

Privileged EXEC mode

# **Command History**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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:

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



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:

Interface	Filter-type	Filter-mode	IP-address	Mac-address	Vlan
fa6/2	in	inactive-tru	st-nort		

• 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:

Interface	Filter-type	Filter-mode	IP-address	Mac-address	Vlan
fa6/3	ip	inactive-no-	snooping-vlan		

• 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.cccd 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.cccd	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.ccce 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



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-tru	st-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.cccd	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

Command	Description
ip dhcp snooping information option	Enables DHCP option 82 data insertion.
ip dhcp snooping limit rate	Configures the number of the DHCP messages that an interface can receive per second.
ip dhcp snooping trust	Enables DHCP snooping on a trusted VLAN.
ip igmp snooping	Enables IGMP snooping.
ip igmp snooping vlan	Enables IGMP snooping for a VLAN.
ip source binding	Adds or deletes a static IP source binding entry.
ip verify source	Enables IP source guard on untrusted Layer 2 interfaces.
show ip source binding	Displays the DHCP snooping binding entries.

# show ipc

To display IPC information, use the **show ipc** command.

show ipc {nodes | ports | queue | status}

# **Syntax Description**

nodes	Displays the participating nodes.
ports	Displays the local IPC ports.
queue	Displays the contents of the IPC retransmission queue.
status	Displays the status of the local IPC server.

## 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. TD Type Name Last Last Sent Heard 10000 Local 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	t/peak/total)	
10000.1	unicast	IPC Master:Zone	(	-, F,	
10000.2	unicast	IPC Master:Echo			
10000.3	unicast	IPC Master:Control			
10000.4	unicast	Remote TTY Server Por	rt		
10000.5	unicast	GALIOS RF :Active			
index = 0	seat_id =	0x2020000 last sent	= 0	heard = 1635	0/1/1635
		GALIOS RED:Active 0x2020000 last sent	= 0	heard = 2	0/1/2
2020000.3 2020000.4 2020000.5 2020000.6 2020000.7	unicast unicast unicast unicast unicast	GALIOS IPC:Card 2:Cor GALIOS RFS :Standby Slave: Remote TTY Cl: GALIOS RF :Standby GALIOS RED:Standby		Ė	

```
RPC packets: current/peak/total 0/1/17 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
O missing callback or queue, O duplicate ACKs, O 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 pak 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 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) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.
--------------	---------------------------------------------------------------------

#### **Command Modes**

User EXEC mode

#### **Command History**

Release	Modification
12.2(40)SG	This command was introduced on the Catalyst 4500.

#### **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

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
MLDVI immediate leave
Explicit host tracking
                                    : Disabled
                                    : Enabled
Multicast router learning mode
                                    : pim-dvmrp
Robustness variable
                                    : 1
Last listener query count
                                    : 2
Last listener query interval : 1000
<output truncated>
Vlan 951:
MLD snooping
                                     : Disabled
Explicit host tracking
Multicast router '
                                    : Disabled
                                    : Enabled
                                   : pim-dvmrp
Multicast router learning mode
Robustness variable : 3
Last listener query count : 2
Last listener query interval : 1000
```

Command	Description
ipv6 mld snooping	Enables IP version 6 (IPv6) Multicast Listener Discovery
	(MLD) snooping globally or on the specified VLAN.

# 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**

vlan vlan-id	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.	
vian vian-ia	(Optional) Specify a VLAN, the range is 1 to 1001 and 1000 to 4094.	

#### **Command Modes**

User EXEC mode

#### **Command History**

Release	Modification
12.2(40)SG	This command was introduced on Catalyst 4500.

#### **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)
```

Command	Description
ipv6 mld snooping	Enables IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping globally or on the specified VLAN.
ipv6 mld snooping vlan	Configures IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping parameters on the VLAN interface.

# 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**

#### **Command Modes**

User EXEC mode

# **Command History**

Release	Modification
12.2(40)SG	This command was introduced on the Catalyst 4500.

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

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

# Examples

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

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
```

Command	Description
ipv6 mld snooping	Enables IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping globally or on the specified VLAN.
ipv6 mld snooping last-listener-query-count	Configures IP version 6 (IPv6) Multicast Listener Discovery Mulitcast Address Specific Queries (MASQs) that will be sent before aging out a client.
ipv6 mld snooping last-listener-query-interval	Configures IP version 6 (IPv6) MLD snooping last-listener query interval on the switch or on a VLAN.
ipv6 mld snooping robustness-variable	Configures the number of IP version 6 (IPv6) MLD queries that the switch sends before deleting a listener that does not respond.
ipv6 mld snooping tcn	Configures IP version 6 (IPv6) MLD Topology Change Notifications (TCNs).

# 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

#### **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

# **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):

The following example shows how to display the ISSU capabilities groups for the IP host ISSU client (clientid=2082):

Command	Description
show issu clients	Displays the ISSU clients.

# 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

#### **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

## **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 HWIDB ISSU client, Entity_Count = 1
Client_ID = 2024, Client_Name = FIB IDB 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
```

```
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 STP MSTP, Entity_Count = 1
Client_ID = 2078, Client_Name = ISSU STP IEEE, Entity_Count = 1
Client_ID = 2079, Client_Name = ISSU STP RSTP, Entity_Count = 1
Client_ID = 2081, Client_Name = ISSU DHCP Snooping client, Entity_Count = 1
Client_ID = 2082, Client_Name = ISSU IP Host client, Entity_Count = 1
Client_ID = 2083, Client_Name = ISSU Inline Power client, Entity_Count = 1
Client_ID = 2084, Client_Name = ISSU IGMP Snooping 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
```

Command	Description
show issu capability	Displays the ISSU capability for a client.
show issu entities	Displays the ISSU entity information.

# 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**

negotiated	Displays negotiated compatibility matrix information.		
stored	Displays stored compatibility matrix information.		
xml	Displays negotiated compatibility matrix information in XML format.		

#### **Defaults**

This command has no default settings.

#### **Command Modes**

User EXEC

#### **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

#### **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 veiw 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 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 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 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

Cid ======	Eid ======	Sid	pSid	pUid	Compatibility
2	1	262151	3	1	COMPATIBLE
3	1	262160	5	1	COMPATIBLE
4	1	262163	9	1	COMPATIBLE
5	1	262186	25	1	COMPATIBLE
7	1	262156	10	1	COMPATIBLE
8	1	262148	7	1	COMPATIBLE
9	1	262155	1	1	COMPATIBLE
10	1	262158	2	1	COMPATIBLE
11	1	262172	6	1	COMPATIBLE
100	1	262166	13	1	COMPATIBLE
110	113	262159	14	1	COMPATIBLE
200	1	262167	24	1	COMPATIBLE
2002	1	_	_	_	UNAVAILABLE
2003	1	262185	23	1	COMPATIBLE
2004	1	262175	16	1	COMPATIBLE
2008	1	262147	26	1	COMPATIBLE
2008	1	262168	27	1	COMPATIBLE
2010	1	262171	32	1	COMPATIBLE
2012	1	262180	31	1	COMPATIBLE
2021	1	262170	41	1	COMPATIBLE
2022	1	262152	42	1	COMPATIBLE
2023	1	_	_	_	UNAVAILABLE
2024	1	_	_	_	UNAVAILABLE
2025	1	_	-	_	UNAVAILABLE
2026	1	_	_	_	UNAVAILABLE
2027	1	_	-	_	UNAVAILABLE
2028	1	-	-	-	UNAVAILABLE
2054	1	262169	8	1	COMPATIBLE
2058	1	262154	29	1	COMPATIBLE
2059	1	262179	30	1	COMPATIBLE
2067	1	262153	12	1	COMPATIBLE
2068	1	196638	40	1	COMPATIBLE
2070	1	262145	21	1	COMPATIBLE
2071	1	262178	11	1	COMPATIBLE
2072	1	262162	28	1	COMPATIBLE
2073	1	262177	33	1	COMPATIBLE
2077	1	262165	35	1	COMPATIBLE
2078	1	196637	34	1	COMPATIBLE
2079	1	262176	36	1	COMPATIBLE
2081	1	262150	37	1	COMPATIBLE
2082	1	262161	39	1	COMPATIBLE
2083	1	262184	20	1	COMPATIBLE
2084	1	262183	38	1	COMPATIBLE
4001	101	262181	17	1	COMPATIBLE
4002	201	262164	18	1	COMPATIBLE

4003 4004	301 401	262182 262146	19 1 22 1		COMPATI COMPATI	
4005	1	262149	4 1		COMPATI	IBLE
Message	group s	summary:				
Cid	Eid 	GrpId	Sid	pSid	pUid 	Nego Result
2	1	1	262151	3	1	Υ
3	1	1	262160	5	1	Y
4	1	1	262163	9	1	Y
5	1	1	262186	25	1	Y
7	1	1	262156	10	1	Y
8	1	1	262148	7	1	Y
9	1	1	262155	1	1	Y
10	1	1	262158	2	1	Y
11	1	1	262172	6	1	Y
100	1	1	262166	13	1	Y
110	113	115	262159	14	1	Y
200	1	1	262167	24	1	Y
2002	1	2	-	-	-	N - did not negotiate
2003	1	1	262185	23	1	Y
2004	1	1	262175	16	1	Y
2008	1	1 2	262147 262168	26 27	1	Y Y
2008	1	1	262168		1	Y Y
2010	1	1	262171	31	1	Y
2012	1	1	262170		1	Y
2021	1	1	262170	42	1	Y
2023	1	1	-	-	_	N - did not negotiate
2024	1	1	_	_	_	N - did not negotiate
2025	1	1	_	=	_	N - did not negotiate
2026	1	1	_	_	_	N - did not negotiate
2027	1	1	_	_	_	N - did not negotiate
2028	1	1	_	-	_	N - did not negotiate
2054	1	1	262169	8	1	Y
2058	1	1	262154	29	1	Y
2059	1	1	262179	30	1	Y
2067	1	1	262153	12	1	Y
2068	1	1	196638	40	1	Y
2070	1	1	262145	21	1	Y
2071	1	1	262178	11	1	Y
2072	1	1	262162	28	1	Y
2073	1	1	262177	33	1	Y
2077	1	1	262165	35	1	Y 
2078	1	1	196637	34	1	Y
2079	1	1	262176	36	1	Y
2081	1	1 1	262150	37 39	1	Y
2082 2083	1	1	262161	20	1	Y Y
2083	1	1	262184 262183	38	1	Y
4001	101	1	262181	17	1	Y
4002	201	1	262164	18	1	Y
4003	301	1	262182	19	1	Y
4004	401	1	262146		1	Y
4005	1	1	262149	4	1	Y
List of Cid		s: nt Name		Base/I	Non-Base	
					======	
2		Proto cl	ient	Base		
3	ISSU		_	Base		
4		CF clien	t RF client	Base		
5 7		CONFIG S		Base Base		
,	TOOU	COME TO D	TINC	Dase		

```
8
         ISSU ifIndex sync
                                 Base
         ISSU IPC client
9
                                 Base
         ISSU IPC Server client Base
10
11
         ISSU Red Mode Client
                                 Base
100
        ISSU rfs client
110
        ISSU ifs client
                                 Base
200
         ISSU Event Manager clientBase
         CEF Push ISSU client Base
2002
2003
         ISSU XDR client
                                 Base
2004
         ISSU SNMP client
                                 Non-Base
                                Base
2008
         ISSU Tableid Client
2010
         ARP HA
                                 Base
2012
         ISSU HSRP Client
                                Non-Base
         XDR Int Priority ISSU cliBase
2021
2022
         XDR Proc Priority ISSU clBase
2023
         FIB HWIDB ISSU client Base
         FIB IDB ISSU client
2024
                                 Base
2025
         FIB HW subblock ISSU clieBase
2026
         FIB SW subblock ISSU clieBase
2027
         Adjacency ISSU client Base
2028
         FIB IPV4 ISSU client
                                 Base
                                Base
2054
         ISSU process client
2058
        ISIS ISSU RTR client Non-Base
2059
        ISIS ISSU UPD client Non-Base
2067
         ISSU PM Client
                                 Base
2068
         ISSU PAGP_SWITCH Client Non-Base
2070
         ISSU Port Security clientNon-Base
         ISSU Switch VLAN client Non-Base
2071
2072
         ISSU dot1x client
                                 Non-Base
2.073
         ISSU STP
                                 Non-Base
2077
         ISSU STP MSTP
                                Non-Base
2078
        ISSU STP IEEE
                                Non-Base
2079
        ISSU STP RSTP
                                Non-Base
2081
        ISSU DHCP Snooping clientNon-Base
2.082
         ISSU IP Host client Non-Base
2083
         ISSU Inline Power client Non-Base
2084
         ISSU IGMP Snooping clientNon-Base
         ISSU C4K Chassis client Base
4001
4002
         ISSU C4K Port client
                                 Base
         ISSU C4K Rkios client
4003
                                 Base
         ISSU C4K HostMan client Base
4004
4005
         ISSU C4k GaliosRedundancyBase
```

This example displays stored compatibility matrix information:

```
Switch> show issu comp-matrix stored
```

Command	Description
show issu clients	Displays the ISSU clients.
show issu sessions	Displays ISSU session information for a specified client.

# 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

## **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

## **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; they 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 :
  Peer_Unique_ID
                    CAP
                               VER
                                      XFORM
                                                  ERP
                                                             Compatibility
         2/0x2
                       1
                                1
                                         1
                                                  1
                                                                     Same
 Shared Negotiation Session Info :
   Nego_Session_ID = 15
   Nego_Session_Name = shared nego session
   Transport_Mtu = 4096
    Ses_In_Use = 2
Switch#
```

Command	Description
show issu clients	Displays the ISSU clients.

# show issu entities

To display the ISSU entity information, use the **show issu entities** command.

show issu entities [client\_id]

#### **Syntax Description**

ctient_ta (Optional) 1550 chem in	client_id	(Optional) ISSU client ID
-----------------------------------	-----------	---------------------------

Defaults

This command has no default settings.

**Command Modes** 

User EXEC

# **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

## **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
```

Command	Description
show issu clients	Displays the ISSU clients.

# 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

Switch#

# **Command History**

Release	Modification
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

Command	Description
show issu clients	Displays the ISSU clients.
show issu sessions	Displays ISSU session information for a specified client.

# 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**

groups	Displays information on Message Group supported by the specified client.
types	Displays information on all Message Types supported by the specified client.
client_id	(Optional) Specifies a client ID.

#### **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

## **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

#### **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:

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#
```

Command	Description
show issu clients	Displays the ISSU clients.

# 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**

capability	Displays all negotiated capabilities.
version	Displays details of all negotiated messages.
session_id	(Optional) Specifies the ISSU session ID for which the capability or version information is displayed.

#### **Defaults**

Displays negotiated capability or version information for all ISSU sessions.

#### **Command Modes**

User EXEC

#### **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

#### **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
```

Command	Description
show issu sessions	Displays ISSU session information for a specified client.

# 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** 

Priviledged EXEC

**Command History** 

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

# 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#

Command	Description
issu acceptversion	Halts the rollback timer and ensures that the new Cisco IOS software image is not automatically stopped during the ISSU process.
issu runversion	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 <b>issu</b> loadversion command.

### 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**

#### Defaults

Displays session information for all clients registered to the ISSU infrastructure.

#### **Command Modes**

User EXEC

#### **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.

#### **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
          Peer Negotiate Negotiated
                                       Cap
                                                 Msg
                                                        Session
  UniqueID Sid
                Role
                           Result GroupID GroupID Signature
            2.6
                 PRIMARY
                          COMPATIBLE
                                         1
                                                 1
                          (no policy)
   Negotiation Session Info for This Message Session:
        Nego_Session_ID = 26
        Nego_Session_Name = dot1x
        Transport_Mtu = 17884
Switch#
```

Command	Description	
show issu clients	Displays the ISSU clients.	

## 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**

slot_number	(Optional) Specifies the slot number whose ISSU state needs to be displayed (1 or 2).
detail	(Optional) Provides detailed information about the state of the active and standby supervisor engines.

#### **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	Modification
12.2(31)SGA	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#

Command	Description
issu abortversion	Cancels the ISSU upgrade or the downgrade process in progress and restores the switch to its state before the start of the process.
issu acceptversion	Halts the rollback timer and ensures that the new Cisco IOS software image is not automatically stopped during the ISSU process.
issu commitversion	Loads the new Cisco IOS software image into the new standby supervisor engine.
issu loadversion	Starts the ISSU process.
issu runversion	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.

## show |2protocol-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**

interface 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.	
summary	(Optional) Displays only Layer 2 protocol summary information.	
begin	(Optional) Displays information beginning with the line that matches the <i>expression</i> .	
exclude	(Optional) Displays information that excludes lines that match the <i>expression</i> .	
include	(Optional) Displays the lines that match the specified expression.	
expression	(Optional) Expression in the output to use as a reference point.	

#### **Command Modes**

User EXEC

#### **Command History**

Release	Modification
12.2(18)EW	This command was first introduced on the Catalyst 4500 series switch.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

#### **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 12protocol-tunnel
COS for Encapsulated Packets: 5

Port	Protocol		_	Encapsulation Counter	-	Drop Counter
Fa0/10						====
	stp			9847	1866	0
	vtp			77	12	0
	pagp			859	860	0
	lacp			0	0	0
	udld			219	211	0
Fa0/11	cdp	1100		2356	2350	0
	stp	1100		116	13	0
	vtp	1100		3	67	0
	pagp		900	856	5848	0
	lacp		900	0	0	0
	udld		900	0	0	0
Fa0/12	cdp			2356	0	0
	stp			11787	0	0
	vtp			81	0	0
	pagp			0	0	0
	lacp			849	0	0
	udld			0	0	0
Fa0/13	cdp			2356	0	0
	stp			11788	0	0
	vtp			81	0	0
	pagp			0	0	0
	lacp			849	0	0
	udld			0	0	0
Switch#						

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

Switch> show 12protocol-tunnel summary COS for Encapsulated Packets: 5

Port	Protocol	Shutdown Threshold (cdp/stp/vtp) (pagp/lacp/udld)		Status
Fa0/10	stp vtp	/	/	up
pa	gp lacp udld	/	/	
Fa0/11	cdp stp vtp	1100/1100/1100	/	up
pa	gp lacp udld	/	900/ 900/ 900	
Fa0/12	cdp stp vtp	/	/	up
pa	gp lacp udld	/	/	
Fa0/13	cdp stp vtp	/	/	up
pa	gp lacp udld	/	/	
Fa0/14	cdp stp vtp	/	/	down
pa	gp udld	/	/	
Fa0/15	cdp stp vtp	/	/	down
pa	gp udld	/	/	
Fa0/16	cdp stp vtp	/	/	down
pa	gp lacp udld	/	/	
Fa0/17	cdp stp vtp	/	/	down
pa	gp lacp udld	/	/	
Switch#				

Command	Description
12protocol-tunnel	Enables protocol tunneling on an interface.
12protocol-tunnel cos	Configures the class of service (CoS) value for all tunneled Layer 2 protocol packets.

## 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**

Release	Modification
12.1(13)EW	Support for this command was introduced on the Catalyst 4500 series switches.

#### **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

	LA	CPDUs	Ma	rker	LACPDUs
Port	Sent	Recv	Sent	Recv	Pkts Err
Channel c	group: 1				
Fa4/1	8	15	0	0	3 0
Fa4/2	14	18	0	0	3 0
Fa4/3	14	18	0	0	0
Fa4/4	13	18	0	0	0
Switch#					

The output displays the following information:

- The LACPDUs Sent and Recv columns display the LACPDUs sent and received on each specific interface.
- The LACPDUs 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
                       LACPDUs
                                 LACP Port
                                            Admin Oper
                                                           Port
                                                                   Port
Port
       Flags
                State Interval Priority Key
                                                           Number State
                                                    Key
Fa4/1
     saC
                bndl 30s
                                 32768
                                            100
                                                    100
                                                           0xc1
                                                                   0x75
                                            100
                                                    100
Fa4/2
                bndl
                       30s
                                 32768
                                                           0xc2
                                                                   0x75
     saC
                                 32768
32768
Fa4/3
        saC
                bndl
                        30s
                                             100
                                                    100
                                                           0xc3
                                                                   0x75
Fa4/4
        saC
                bndl
                        30s
                                             100
                                                    100
                                                           0xc4
                                                                   0x75
Switch#
```

Table 2-24 lists the output field definitions.

Table 2-24 show lacp internal Command Output Fields

Field	Description		
State	State of the specific port at the current moment is displayed; allowed values are as follows:		
	• <i>bndl</i> —Port is attached to an aggregator and bundled with other ports.		
	• <i>susp</i> —Port is in a suspended state; it is not attached to any aggregator.		
	• <i>indep</i> —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).		
	• hot-sby—Port is in a Hot-standby state.		
	• down—Port is down.		
LACPDUs Interval	Interval setting.		
LACP Port Priority	Port priority setting.		
Admin Key	Administrative key.		
Oper Key	Operator key.		
Port Number	Port number.		
Port State	State variables for the port encoded as individual bits within a single octet with the following meaning [1]:		
	• bit0: LACP_Activity		
	• bit1: LACP_Timeout		
	• bit2: Aggregation		
	• bit3: Synchronization		
	• bit4: Collecting		
	• bit5: Distributing		
	• bit6: Defaulted		
	• bit7: Expired		

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.
Channel group 1 neighbors
         Partner
                                   Partner
                                   Port Number
Port
          System ID
                                                   Age
                                                           Flags
Fa4/1
        8000,00b0.c23e.d84e
                                   0x81
                                                    29s
                                                            Ρ
                                                            Ρ
        8000,00b0.c23e.d84e
                                                    0s
Fa4/2
                                   0x82
Fa4/3
          8000,00b0.c23e.d84e
                                   0x83
                                                    0s
                                                            Ρ
Fa4/4
          8000,00b0.c23e.d84e
                                   0x84
                                                    0s
          Port
                        Admin
                                   Oper
                                             Port
          Priority
                        Key
                                   Key
                                             State
          32768
Fa4/1
                        2.00
                                   200
                                             0 \times 81
Fa4/2
          32768
                                   200
                        200
                                             0x81
Fa4/3
          32768
                        200
                                   200
                                             0x81
Fa4/4
          32768
                        200
                                   200
                                             0x81
Switch#
```

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.

Command	Description
lacp port-priority	Sets the LACP priority for the physical interfaces.
lacp system-priority	Sets the priority of the system for LACP.

## 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	(Optional) Interface type; possible valid value is <b>gigabitethernet</b> .
interface-number	Module and port number.
all	(Optional) Displays MAB information for all interfaces.
detail	(Optional) Displays detailed MAB information.

#### **Command Default**

This command has no default settings.

#### **Command Modes**

**EXEC** 

#### **Command History**

Release	Modification
12.2(50)SG	Support for this command was introduced on the Catalyst 4500 series switches.

#### **Usage Guidelines**

Table 2-25 lists the fields in the show mab command.

#### Table 2-25 show mab Command Output

Field	Description
Mac-Auth-Bypass	MAB state
Inactivity Timeout	Inactivity timeout
Client MAC	Client MAC address
MAB SM state	MAB state machine state
Auth Status	Authorization status

Table 2-26 lists the possible values for the state of the MAB state machine.

#### Table 2-26 MAB State Machine Values

State	State Level	Description
Initialize	Intermediate	The state of the session when it initializes
Acquiring	Intermediate	The state of the session when it is obtaining the client MAC address

Table 2-26 MAB State Machine Values (continued)

Authorizing	Intermediate	The state of the session during MAC-based authorization
Terminate		The state of the session once a result has been obtained. For a session in terminal state, "TERMINATE" displays.

Table 2-27 lists the possible displayed values for the MAB authorization status.

Table 2-27 MAB Authorization Status Values

Status	Description
AUTHORIZED	The session has successfully authorized.
UNAUTHORIZED	The session has failed to be authorized.

#### **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

Switch#
```

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
Switch#
```

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#

Command	Description
mab	Enables and configures MAC authorization bypass (MAB) on a port.

## 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**

interface	(Optional) Specifies the interface type; valid values are <b>ethernet</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>pos</b> , <b>atm</b> , <b>port-channel</b> , and <b>ge-wan</b> .
interface-number	(Optional) Specifies the port number.

#### Defaults

This command has no default settings.

#### **Command Modes**

Privileged EXEC mode

#### **Command History**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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

Command	Description
access-group mode	Specifies the override modes (for example, VACL overrides PACL) and the non-override modes (for example, merge or strict mode).

## 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  $type\ slot/port \mid protocol\ protocol\ vlan\ vlan\_id$ ]

#### **Syntax Description**

mac_addr	48-bit MAC address; the valid format is H.H.H.		
interface type slot/port	(Optional) Displays information for a specific interface; valid values for type are <b>fastethernet</b> , <b>gigabitethernet</b> , and <b>tengigabitethernet</b> .		
protocol protocol	(Optional) Specifies a protocol. See the "Usage Guidelines" section for more information.		
vlan vlan_id	(Optional) Displays entries for the specific VLAN only; valid values are from 1 to 4094.		

#### 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.
12.1(12c)EW	Added support for extended VLAN addresses.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

#### **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.

#### Examples

This example shows how to display MAC address table information for a specific MAC address:

#### Switch# show mac-address-table address 0030.94fc.0dff

vlan	Entries mac address	type	protocols	port
1	0030.94fc.0dff 0030.94fc.0dff 0030.94fc.0dff	static static	<pre>ip,ipx,assigned,other ip,ipx,assigned,other ip,ipx,assigned,other</pre>	Switch Switch

Command	Description		
show mac-address-table aging-time	Displays MAC address table aging information.		
show mac-address-table count	Displays the number of entries currently in the MAC address table.		
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.		
show mac-address-table interface	Displays the MAC address table information for a specific interface.		
show mac-address-table multicast	Displays information about the multicast MAC address table.		
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.		
show mac-address-table static	Displays the static MAC address table entries only.		
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.		

## 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(12c)EW	Support for extended addressing was added.

#### **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:

 ${\tt Switch\#\ show\ mac-address-table\ aging-time\ vlan\ 100}$ 

Vlan Aging Time
---- 100 300

Switch#

Command	Description
show mac-address-table address	Displays the information about the MAC-address table.
show mac-address-table count	Displays the number of entries currently in the MAC address table.
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.
show mac-address-table interface	Displays the MAC address table information for a specific interface.
show mac-address-table multicast	Displays information about the multicast MAC address table.

Command	Description	
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.	
show mac-address-table static	Displays the static MAC address table entries only.	
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.	

## 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) S	Specifies a V	/LAN; valid values	are from 1 to 4094.
--------------	--------------	---------------	--------------------	---------------------

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.
12.1(12c)EW	Added support for extended VLAN addresses.

#### **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:

Static Unicast Address (User-defined) Count:

Static Unicast Address (System-defined) Count:

Total Unicast MAC Addresses In Use:

Total Unicast MAC Addresses Available:

32768

Multicast MAC Address Count:

Total Multicast MAC Addresses Available:

16384

Switch#

Command	Description
show mac-address-table address	Displays the information about the MAC-address table.
show mac-address-table aging-time	Displays MAC address table aging information.
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.
show mac-address-table interface	Displays the MAC address table information for a specific interface.
show mac-address-table multicast	Displays information about the multicast MAC address table.
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.

Command	Description
show mac-address-table static	Displays the static MAC address table entries only.
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.

## 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**

address mac_addr	(Optional) Specifies a 48-bit MAC address; the valid format is H.H.H.
interface type slot/port	(Optional) Specifies an interface to match; valid values for <i>type</i> are <b>fastethernet</b> , <b>gigabitethernet</b> , and <b>tengigabitethernet</b> .
protocol protocol	(Optional) Specifies a protocol. See the "Usage Guidelines" section for more information.
vlan vlan_id	(Optional) Displays entries for a specific VLAN; valid values are from 1 to 4094.

#### 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.
12.1(12c)EW	Added support for extended VLAN addresses.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

#### **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:

tch# show mac-address-table dynamic			
Entries			
mac address	type	protocols	port
+	+	+	
0000.0000.0201	dynamic	ip	FastEthernet6/15
0000.0000.0202	dynamic	ip	FastEthernet6/15
0000.0000.0203	dynamic	ip,assigned	FastEthernet6/15
0000.0000.0204	dynamic	ip,assigned	FastEthernet6/15
0000.0000.0205	dynamic	ip,assigned	FastEthernet6/15
0000.0000.0101	dynamic	ip	FastEthernet6/16
0000.0000.0102	dynamic	ip	FastEthernet6/16
0000.0000.0103	dynamic	ip,assigned	FastEthernet6/16
0000.0000.0104	dynamic	ip,assigned	FastEthernet6/16
0000.0000.0105	dynamic	ip,assigned	FastEthernet6/16
	Entries mac address  0000.0000.0201 0000.0000.0202 0000.0000.	Entries mac address type  0000.0000.0201 dynamic 0000.0000.0202 dynamic 0000.0000.0204 dynamic 0000.0000.0205 dynamic 0000.0000.0101 dynamic 0000.0000.0102 dynamic 0000.0000.0103 dynamic 0000.0000.0104 dynamic	Entries mac address type protocols  0000.0000.0201 dynamic ip 0000.0000.0202 dynamic ip 0000.0000.0203 dynamic ip,assigned 0000.0000.0204 dynamic ip,assigned 0000.0000.0205 dynamic ip,assigned 0000.0000.0101 dynamic ip 0000.0000.0102 dynamic ip 0000.0000.0103 dynamic ip 0000.0000.0104 dynamic ip,assigned 0000.0000.0104 dynamic ip,assigned

This example shows how to display the dynamic MAC address entries with a specific protocol type (in this case, assigned):

	# show mac-address-table dynamic protocol assigned t Entries			
	mac address	type	protocols	port
1	0000.0000.0203		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#				

Command	Description
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.
show mac-address-table static	Displays the static MAC address table entries only.
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.

## 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**

type	Interface type; valid values are <b>ethernet</b> , <b>fastethernet</b> , <b>gigabitethernet</b> , and <b>tengigabitethernet</b> .
slot/port	Number of the slot and port.

#### 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(25)EW	Added support for the 10-Gigabit Ethernet interface.	

#### **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

vlan	Entries mac address	type	-	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
vlan	st Entries mac address		ports	
2 Switch#	ffff.ffff.ffff	system l	Fa6/16	

Command	Description
show mac-address-table address	Displays the information about the MAC-address table.
show mac-address-table aging-time	Displays MAC address table aging information.
show mac-address-table count	Displays the number of entries currently in the MAC address table.
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.
show mac-address-table multicast	Displays information about the multicast MAC address table.
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.
show mac-address-table static	Displays the static MAC address table entries only.
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.

## 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**

count	(Optional) Displays the number of multicast entries.
igmp-snooping	(Optional) Displays only the addresses learned by IGMP snooping.
user	(Optional) Displays only the user-entered static addresses.
vlan vlan_num	(Optional) Displays information for a specific VLAN only; valid values are from 1 to 4094.

#### 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.
12.1(12c)EW	Added support for extended VLAN addresses.

#### **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:

 ${\tt Switch\#\ show\ mac-address-table\ multicast\ vlan\ 1}$ 

Multicast Entries

vlan mac address type ports

-----+

1 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:
Total Multicast MAC Addresses Available:
16384
Switch#

Command	Description
show mac-address-table address	Displays the information about the MAC-address table.
show mac-address-table aging-time	Displays MAC address table aging information.
show mac-address-table count	Displays the number of entries currently in the MAC address table.
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.
show mac-address-table interface	Displays the MAC address table information for a specific interface.
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.
show mac-address-table static	Displays the static MAC address table entries only.
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.

### 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]

#### **Syntax Description**

change	(Optional) Displays the MAC address change notification status.	
interface	(Optional) Displays MAC change information for an interfaces.	
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.	

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.

#### **Usage Guidelines**

Use the **show mac-address-table notification change** command to display whether the MAC change feature is enabled or disabled, the MAC change notification interval, the maximum number of entries allowed in the history table, and the history table contents.

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

#### **Examples**

This example shows how to display all the MAC address notification information:

```
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

Operation: Added Vlan: 1 MAC Addr: 1234.5678.9ab4 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#

Command	Description
clear mac-address-table	Clears the address entries from the Layer 2 MAC address table.
mac-address-table notification	Enables MAC address notification on a switch.
snmp-server enable traps	Enables SNMP notifications (traps or informs).
snmp trap mac-notification change	Enables SNMP MAC address notifications.

## 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**

assigned	Specifies the assigned protocol entries.
ip	Specifies the IP protocol entries.
ipx	Specifies the IPX protocol entries.
other	Specifies the other protocol entries.

#### 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**

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		-	_	ports +
200	0050.3e8d.6400		assigned		
100	0050.3e8d.6400	static	assigned		Switch
5	0050.3e8d.6400	static	assigned		Switch
4092	0000.0000.0000	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
Switc	h#				

This example shows the other output for the previous example:

	Switch# show mac-address-table protocol other Unicast Entries			
vlan	mac address		protocols +	port
1				FastEthernet6/15
1	0000.0000.0202	dynamic	other	FastEthernet6/15
1	0000.0000.0203	dynamic	other	FastEthernet6/15
1	0000.0000.0204	dynamic	other	FastEthernet6/15
1	0030.94fc.0dff	static	ip,ipx,assigned,other	Switch
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
Fa6/1	0030.94fc.0dff	static	ip,ipx,assigned,other	Switch
Fa6/2	0030.94fc.0dff	static	ip,ipx,assigned,other	Switch
Multica	st Entries			
	mac address		ports	
	ffff.ffff.ffff		Switch,Fa6/15	
2	ffff.ffff.ffff	system :	Fa6/16	
1002	ffff.ffff.ffff	system		
1003	ffff.ffff.ffff	system		
1004	ffff.ffff.ffff	system		
1005	ffff.ffff.ffff	system		
Fa6/1	ffff.ffff.ffff	system	Switch,Fa6/1	
Fa6/2	ffff.ffff.ffff	system	Switch,Fa6/2	
Switch#				

Command	Description
show mac-address-table address	Displays the information about the MAC-address table.
show mac-address-table aging-time	Displays MAC address table aging information.
show mac-address-table count	Displays the number of entries currently in the MAC address table.
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.
show mac-address-table interface	Displays the MAC address table information for a specific interface.
show mac-address-table multicast	Displays information about the multicast MAC address table.
show mac-address-table static	Displays the static MAC address table entries only.
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.

## 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**

address mac_addr	(Optional) Specifies a 48-bit MAC address to match; the valid format is H.H.H.
interface type number	(Optional) Specifies an interface to match; valid values for <i>type</i> are <b>fastethernet</b> , <b>gigabitethernet</b> , and <b>tengigabitethernet</b> .
protocol protocol	(Optional) Specifies a protocol. See the "Usage Guidelines" section for more information.
vlan vlan_id	(Optional) Displays the entries for a specific VLAN; valid values are from 1 to 4094.

#### 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.
12.1(12c)EW	Added support for extended VLAN addresses.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

#### **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.

#### **Examples**

This example shows how to display all the static MAC address entries:

Switch# show mac-address-table static Unicast Entries					
vlan	mac address	type	protocols	port	
			++		
1	0030.94fc.0dff	static	: ip,ipx,assigned,other	Switch	
Fa6/1	0030.94fc.0dff	static	: ip,ipx,assigned,other	Switch	
Fa6/2	0030.94fc.0dff	static	ip,ipx,assigned,other	Switch	
Multica	st Entries				
	mac address		-		
	+	++			
1	ffff.ffff.ffff	system	Switch, Fa6/15		
2	ffff.ffff.ffff	system	Fa6/16		
1002	ffff.ffff.ffff	system			
1003	ffff.ffff.ffff	system			
1004	ffff.ffff.ffff	system			
1005	ffff.ffff.ffff	system			
Fa6/1	ffff.ffff.ffff	system	Switch,Fa6/1		
Fa6/2	ffff.ffff.ffff	system	Switch, Fa6/2		
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 vlan mac address type protocols port 1 0030.94fc.0dff static ip,ipx,assigned,other Switch Fa6/1 0030.94fc.0dff static ip,ipx,assigned,other Switch Fa6/2 0030.94fc.0dff static ip, ipx, assigned, other Switch Multicast Entries vlan mac address type ports \_\_\_\_\_\_ ffff.ffff.ffff system Switch,Fa6/15 1 ffff.ffff.ffff system Fa6/16 2. 1002 ffff.ffff.ffff system 1003 ffff.ffff.ffff system ffff.ffff.ffff system 1004 ffff.ffff.ffff system 1005 ffff.ffff.ffff system Switch,Fa6/1 Fa6/1 ffff.ffff.ffff system Switch,Fa6/2 Fa6/2 Switch#

Command	<b>Description</b> Displays the information about the MAC-address table.		
show mac-address-table address			
show mac-address-table aging-time	Displays MAC address table aging information.		
show mac-address-table count	Displays the number of entries currently in the MAC address table.		
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.		
show mac-address-table interface	Displays the MAC address table information for a specific interface.		

Command	Description		
show mac-address-table multicast	Displays information about the multicast MAC address table.		
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.		
show mac-address-table vlan	Displays information about the MAC address table for a specific VLAN.		

## 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**

vlan vlan_id	(Optional) Displays the entries for a specific VLAN; valid values are from 1 to 4094.
protocol protocol	(Optional) Specifies a protocol. See the "Usage Guidelines" section for more information.

#### **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.
12.1(12c)EW	Support for extended addressing was added.

#### **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 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 vlan mac address type proto

vlan	mac address	type	protoco1s +	port
1	0000.0000.0201	dynamic		FastEthernet6/15
1	0000.0000.0202	dynamic	ip	FastEthernet6/15
1	0000.0000.0203	dynamic	other	FastEthernet6/15
1	0000.0000.0204	dynamic	other	FastEthernet6/15
1	0030.94fc.0dff	static	ip,ipx,assigned,other	Switch
Multica	st Entries			
	mac address	type	ports	
1 Switch#	ffff.ffff.ffff		Switch,Fa6/15	

This example shows how to display MAC address table information for a specific protocol type:

#### ${\tt Switch\#}$ show mac-address-table vlan 100 protocol other

vlan	Entries mac address	type	protocols	port
1 1 1	0000.0000.0203 0000.0000.0204 0030.94fc.0dff	dynamic dynamic	other	FastEthernet6/15 FastEthernet6/15 Switch
vlan	st Entries mac address	type	ports	
1 Switch#	ffff.ffff.ffff	•	Switch,Fa6/15	

Command	Description		
show mac-address-table address	Displays the information about the MAC-address table.		
show mac-address-table aging-time	Displays MAC address table aging information.		
show mac-address-table count	Displays the number of entries currently in the MAC address table.		
show mac-address-table dynamic	Displays the dynamic MAC address table entries only.		
show mac-address-table interface	Displays the MAC address table information for a specific interface.		
show mac-address-table multicast	Displays information about the multicast MAC address table.		
show mac-address-table protocol	Displays the MAC address table information that is based on the protocol.		
show mac-address-table static	Displays the static MAC address table entries only.		

## 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(25)EW	Enhanced the output of the <b>show idprom interface command</b> to include the 10-Gigabit Ethernet interface.

#### **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."

Switch#

#### **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 Mod Ports Card Type Model Serial No. 1 2 1000BaseX (GBIC) Supervisor(active) WS-X4014 JAB054109GH WS-X4306 WS-X4418 2 6 1000BaseX (GBIC) 00000110 3 18 1000BaseX (GBIC) JAB025104WK 5 0 Not enough power for module WS-X4148-FX-MT 0000000000 48 10/100BaseTX (RJ45) WS-X4148 JAB023402RP M MAC addresses Hw Fw 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 3 0050.7356.2b36 to 0050.7356.2b47 1.0 Ωk 5 0001.64fe.a930 to 0001.64fe.a95f 0.0 PwrDenv 6 0050.0f10.28b0 to 0050.0f10.28df 1.0 Ok

This example shows how to display information for a specific module:

Switch# show module mod2 Mod Ports Card Type		Model		Serial No.
2 2 Catalyst 4000 supervis	or 2 (Active)	WS-X6K-SU	JP2-2GE	SAD04450LF1
Mod MAC addresses	Hw	Fw	Sw	Status
2 0001.6461.39c0 to 0001.6461	.39c1 1.1	6.1(3)	6.2(0.97	,
Mod Sub-Module	Model	Serial	Hw	
1	WS-F6K-PFC2 WS-F6K-MSFC2	SAD04440HV SAD04430J9		

This example shows how to display information for all the modules on the switch:

```
Switch# show module
Chassis Type: WS-C4506
Power consumed by backplane : 0 Watts
Mod Ports Card Type
                                       Model
                                                       Serial No.
     6 XG (X2), 1000BaseX (SFP) Supervisor(ac WS-X4517
3
     6 1000BaseX (GBIC)
                                       WS-X4306
                                                       00000110
M MAC addresses
                            Hw Fw
                                                        Status
                                          Sw
--+----
1 0004.dd46.7700 to 0004.dd46.7705 0.0 12.2(20r)EW( 12.2(20040513:16 Ok
3 0010.7bab.9920 to 0010.7bab.9925 0.2
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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(13)EW	Added support for differing directions within a single user session.
12.1(19)EW	Output enhanced to display configuration status of SPAN enhancements.
12.1(20)EW	Added support to display configuration state for remote SPAN and learning.
12.2(20)EW	Added support to display ACLs that are applied to SPAN sessions.

#### **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
```

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#
Switch#
```

#### **Related Commands**

Command	Description
monitor session	Enables the SPAN sessions on interfaces or VLANs.

## 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**

group-number	(Optional) Channel-group number; valid values are from 1 to 64.
counters	Specifies the traffic counter information.
dual-active	Specifies the dual-active information.
internal	Specifies the PAgP internal information.
neighbor	Specifies the PAgP neighbor information.

**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**

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

	Inform	Information		ush
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
\mathrm{Gi}2/3 Yes VS3 \mathrm{Gi}1/1/1 1.1
Gi2/4 Yes VS3 Gi2/1/1 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

				Hello	Partner	PAgP	Learning	
Port	Flags	State	Timers	Interval	Count	Priority	Method	IfIndx
Fa5/4	SC	U6/S7		30s	1	128	Any	129
Fa5/5	SC	U6/S7		30s	1	128	Any	129
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

	Partner	Partner	Partner		Partner	Group
Port	Name	Device ID	Port	Age	Flags	Cap.
Fa5/4	JAB031301	0050.0f10.230c	2/45	2s	SAC	2D
Fa5/5	JAB031301	0050.0f10.230c	2/46	27s	SAC	2D

#### Channel group 2 neighbors

	Partner	Partner	Partner		Partner	Group
Port	Name	Device ID	Port	Age	Flags	Cap.
Fa5/6	JAB031301	0050.0f10.230c	2/47	10s	SAC	2F
Fa5/7	JAB031301	0050.0f10.230c	2/48	11s	SAC	2F

Switch#

Command	Description
pagp learn-method	Learns the input interface of the incoming packets.
pagp port-priority	Selects a port in hot standby mode.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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#
```

Command	Description
class-map	Creates a class map to be used for matching packets to the class whose name you specify and to enter class-map configuration mode
policy-map	Creates a policy map that can be attached to multiple ports to specify a service policy and to enter policy-map configuration mode
show class-map	Displays class map information.
show policy-map interface	Displays the statistics and configurations of the input and output policies that are attached to an interface.

## 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**

Release	Modification
12.2(31)SG	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.

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 2-28 describes the fields shown in the display.

Switch# show policy-map control-plane

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#
```

Table 2-28 show policy-map control-plane Field Descriptions

Field	Description
Fields Associated with Classes or Service P	olicies
Service-policy input	Name of the input service policy that is applied to the control plane. (If configured, this field will also show the output service policy.)
Class-map	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.
Match	Match criteria for the specified class of traffic.
	Note 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.
Fields Associated with Traffic Policing	
police	<b>police</b> command has been configured to enable traffic policing.
conformed	Action to be taken on packets conforming to a specified rate; displays the number of packets and bytes on which the action was taken.
exceeded	Action to be taken on packets exceeding a specified rate; displays the number of packets and bytes on which the action was taken.

Command	Description
control-plane	Enters control-plane configuration mode.
service-policy input (control-plane)	Attaches a policy map to a control plane for aggregate control plane services.

# 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**

Release	Modification	
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.	
12.1(12c)EW	Added support for extended VLAN addresses.	
12.2(25)SG	Displays results for full flow policing.	

#### **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:any
    0 packets
```

```
service-policy output: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:any
    0 packets
Switch#
```

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
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:any
        0 packets
Switch#
```

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 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 policy-map p1
  Policy Map p1
   Class c1
      police 1000000 bps 9000 byte conform-action transmit exceed-action drop
Switch# show policy-map interface
FastEthernet6/1
  Service-policy input: p1
   Class-map: c1 (match-all)
      15432182 packets
      Match: flow ip source-address ip destination-address ip protocol 14 source-port 14
destination-port
      police: Per-interface
        Conform: 64995654 bytes Exceed: 2376965424 bytes
    Class-map: class-default (match-any)
      0 packets
      Match: any
        0 packets
Switch#
```

Command	Description
class-map	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.
policy-map	Creates a policy map that can be attached to multiple ports to specify a service policy and to enter policy-map configuration mode.
show class-map	Displays class map information.
show qos	Displays QoS information.

## 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**

Release	Modification
12.1(13)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **Examples**

Take the following configuration on a non-Supervisor Engine 6-E as an example:

```
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
Switch#
```

Take the following configuration on a non-Supervisor Engine 6-E as an example:

```
interface fastethernet6/1
vlan-range 100
service-policy in p1
```

Service-policy input: 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
```

```
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
0 packets
Switch#
```

Take the following configuration on a Supervisor Engine 6-E as an example:

```
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:
           exceeded 0 packets, 0 bytes; action:
             drop
           conformed 0 bps, exceeded 0 bps
     Class-map: class-default (match-any)
       0 packets
       Match: any
         0 packets
```

#### **Related Commands**

Command	Description
service-policy (interface configuration)	Attaches a policy map to an interface.
show policy-map interface	Displays the statistics and configurations of the input and output policies that are attached to an interface.

## 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**

Release	Modification
12.1(13)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.2(18)EW	Support was enhanced to display sticky MAC addresses.
12.2(25)EWA	Support was enhanced to display settings on a per-VLAN basis.
12.2(31)SGA	Support was enhanced to display settings on EtherChannel interfaces.

#### **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 (Count)	CurrentAddr (Count)	SecurityViolation (Count)	Security Action
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:

## ${\tt Switch \#\ show\ port-security\ interface\ fastethernet\ 5/1}$

: Enabled Port Security : Secure-up Port Status Violation Mode : Shutdown Aging Time : 0 mins : Absolute Aging Type SecureStatic Address Aging : Disabled

Maximum MAC Addresses : 1 Total MAC Addresses Configured MAC Addresses : 0 Sticky MAC Addresses : 1
Last Source Address : 00

: 0000.0001.001a

Security Violation Count : 0

This example shows how to display all secure MAC addresses configured on all switch interfaces:

Switch# show port-security address

Secure Mac Address Table

Vlan	Mac Address	Туре	Ports	Remaining Age (mins)
1	0000.0001.0000	SecureConfigured	Fa3/1	15 (I)
1	0000.0001.0001	SecureConfigured	Fa3/1	14 (I)
1	0000.0001.0100	SecureConfigured	Fa3/2	-
1	0000.0001.0101	SecureConfigured	Fa3/2	=
1	0000.0001.0200	SecureConfigured	Fa3/3	=
1	0000.0001.0201	SecureConfigured	Fa3/3	-
1	0000.0001.0300	SecureConfigured	Fa3/4	-
1	0000.0001.0301	SecureConfigured	Fa3/4	=
1	0000.0001.1000	SecureDynamic	Fa3/5	=
1	0000.0001.1001	SecureDynamic	Fa3/5	=
1	0000.0001.1100	SecureDynamic	Fa3/6	=
1	0000.0001.1101	SecureDynamic	Fa3/6	=
1	0000.0001.1200	SecureSticky	Fa3/7	=
1	0000.0001.1201	SecureSticky	Fa3/7	-
1	0000.0001.1300	SecureSticky	Fa3/8	=
1	0000.0001.1301	SecureSticky	Fa3/8	-
1	0000.0001.2000	SecureSticky	Po2	-

Total Addresses in System (excluding one mac per port) :8
Max Addresses limit in System (excluding one mac per port) :3072

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:

 ${\tt Switch\#\ show\ port-security\ interface\ gigabitethernet1/1\ vlan}$ 

Default maximum: 22 VLAN Maximum Current 2 22 3 22 3 3 4 22 3 22 5 1 22 2

This example shows how to display the port security settings on interface Gigabitethernet1/1 for VLANs 2 and 3:

#### ${\tt Switch\#\ show\ port-security\ interface\ gigabitethernet1/1\ vlan\ 2-3}$

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 Add	ress Table			
Vlan	Mac Address	Туре	Ports	Remaining Age(mins)	
2	0001.0001.0001	SecureConfigured	Gi1/1	_	
2	0001.0001.0002	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	0001.0001.0003	SecureSticky	Gi1/1	-	
6	0001.0001.0001	SecureConfigured	Gi1/1	-	
6	0001.0001.0002	SecureConfigured	Gi1/1	_	

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

/lan	Mac Address	Туре	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	=

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

- - -

Defau	22	
VLAN	Maximum	Current
2	22	3
3	22	3
5	22	1
6	22	2
Switc	h#	

This example shows how to display the port security settings on Fast Ethernet port 1 for VLANs 2 and 3:

Switch# show	port	t-security	interface	${\tt fastethernet5/1}$	vlan	2-3
Default maxim	um:	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 Add	ress Table		
Vlan	Mac Address	Туре	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:

 ${\tt Switch \#\ show\ port-security\ interface\ fastethernet5/1\ address\ vlan\ 2-3}$ 

	Secure Mac Add	lress Table		
Vlan	Mac Address	Туре	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	_

Total Addresses: 12

This example shows how to display all secure MAC addresses configured on all switch interfaces:

Switch# show port-security address

Secure Mac Address Table

Vlan	Mac Address	Туре	Ports	Remaining Age (mins)
1	0000.0001.0000	SecureConfigured	Fa3/1	15 (I)
1	0000.0001.0001	SecureConfigured	Fa3/1	14 (I)
1	0000.0001.0100	SecureConfigured	Fa3/2	_
1	0000.0001.0101	SecureConfigured	Fa3/2	-
1	0000.0001.0200	SecureConfigured	Fa3/3	-
1	0000.0001.0201	SecureConfigured	Fa3/3	=
1	0000.0001.0300	SecureConfigured	Fa3/4	=
1	0000.0001.0301	SecureConfigured	Fa3/4	_
1	0000.0001.1000	SecureDynamic	Fa3/5	_
1	0000.0001.1001	SecureDynamic	Fa3/5	=
1	0000.0001.1100	SecureDynamic	Fa3/6	_
1	0000.0001.1101	SecureDynamic	Fa3/6	-
1	0000.0001.1200	SecureSticky	Fa3/7	=
1	0000.0001.1201	SecureSticky	Fa3/7	-
1	0000.0001.1300	SecureSticky	Fa3/8	=
1	0000.0001.1301	SecureSticky	Fa3/8	-

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:

 ${\tt Switch \# \ show \ port-security \ interface \ gigabitethernet 1/1 \ vlan}$ 

Defau	lt maximu	ım:	22	
VLAN	Maximum		Current	
2		22		3
3		22		3
4		22		3
5		22		1
6		22		2
C1.11 + 0	h#			

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
Switc	h#			

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					
Vlan	Mac Address	Туре	Ports	Remaining Age(mins)	
2	0001.0001.0001	SecureConfigured	Gi1/1	_	
2	0001.0001.0002	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	0001.0001.0003	SecureSticky	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 interface Gigabitethernet1/1 with aging information for each address:

Switch# show port-security interface gigabitethernet1/1 address vlan 2-3

Secure Mac Address Table					
Vlan	Mac Address	Туре	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	-	

Total Addresses: 12

Switch#

Command	Description
switchport port-security	Enables port security on an interface.

## show power

To display information about the power status, use the **show power** command.

show power [available | capabilities | detail | inline {[interface] | consumption default | module | module | status | supplies]

## **Syntax Description**

available	(Optional) Displays the available system power.
capabilities	(Optional) Displays the individual power supply capabilities.
detail	(Optional) Displays detailed information on power resources.
inline	(Optional) Displays the PoE status.
interface	(Optional) Type of interface; the only valid value is <b>fastethernet.</b>
consumption default	(Optional ) Displays the PoE consumption.
module mod	(Optional) Displays the PoE consumption for the specified module.
module	(Optional) Displays the power consumption for each module.
status	(Optional) Displays the power supply status.
supplies	(Optional) Displays the number of power supplies needed by the system.

#### **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(25)SG	Displays inline power handling for the Supervisor Engine II-TS.

## **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 Power over Ethernet, you will receive this message:

Power over Ethernet not supported on interface Admin

The **show power in-line** *interface* | *module* command displays the amount of power that is used to operate a Cisco 7960 IP Phone. To view the amount of power requested, use the **show cdp neighbors** command.

Because of the PoE consumed by FPGAs and other hardware components on the module the operating PoE consumption for an 802.3af-compliant module can be nonzero, even 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				Fan	Inline
Supply	Model No	Type	Status	Sensor	Status
PS1	PWR-C45-2800AC	AC 2800W	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 (in Watts)	Used	Maximum Available	
System Power (12V) Inline Power (-50V)	328 0	1360 1400	
Backplane Power (3.3V)	10	40	
Total Used Switch#	338	(not to exceed	Total Maximum Available = 750)

This example shows how to display the amount of available system power:

## Switch# show power available

Power Summary

(in Watts)	Available	Used	Remaining
System Power	1360	280	1080
Inline Power	1400	0	1400
Maximum Power	2800	280	2520
Switch#			

This example shows how to display detailed information for system power.

#### Switch# show power detail

Power				Fan	Inline
Supply	Model No	Туре	Status	Sensor	Status
PS1	PWR-C45-1400DC	DCSP1400W	good	good	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		Maximum
(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)  $(12V \rightarrow -48V \text{ on board conversion})$ 


		Maximum
Mod	Used	Available
1	5	25

		Watts Use	d of System Po	wer (12V)
Mod	Model	currently	out of reset	in reset
1	WS-X4013+TS	180	180	180
2	WS-X4506-GB-T	60	60	20
3	WS-X4424-GB-RJ45	90	90	50
	Fan Tray	30		
	Total	360	330	250

Watts used of Chassis Inline Power (-50V)

		Inline	Power Admin	Inline P	ower Oper	
Mod	Model	PS	Device	PS	Device	Efficiency
2	WS-X4506-GB-T	0	0	0	0	89
3	WS-X4424-GB-RJ45	-	-	-	-	=
	Total	0	0	0	0	

Watts used of Module Inline Power (12V -> -50V)
Inline Power Admin Inline Power Oper
PS Device PS Device Efficie

1	WS-X4013+TS	6	5	3	3	90
Mod	Model	PS	PS Device		PS Device	

Switch#

This example shows how to display power consumption for the module.

#### Switch# show power module

Watts Used of System Power (12V)

Mod	Model	currently	out of reset	ın reset
1	WS-X4013+TS	180	180	180
2	WS-X4506-GB-T	60	60	20
3	WS-X4424-GB-RJ45	90	90	50
	Fan Tray	30		
	Total	360	330	250

Watts used of Chassis Inline Power (-50V)

		Inline H	Power Admin	Inline Po	wer Oper	
Mod	Model	PS	Device	PS	Device	Efficiency
2	WS-X4506-GB-T	0	0	0	0	89
3	WS-X4424-GB-RJ45	_	-	_	-	_
	Total	0	0	0	0	
Watts	used of Module In	line Powe	er (12V -> -	50V)		
		Inline H	Power Admin	Inline Po	wer Oper	

Mod	Model	Inline E	Power Admin Device		-	Efficiency
1	WS-X4013+TS	6	 5	3	3	90



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 po	wer stat	us				
Power						Fan	Inline
Supply	Model N	0	Type	5	Status	Sensor	Status
PS1	PWR-C45	-2800AC	AC 28	00W c	good	good	good
PS2	PWR-C45	-2800AC	AC 28	00W g	good	good	good
Power S	upply	Max	Min	Max	Min	Absolute	
(Nos in	Watts)	Inline	Inline	System	n System	Maximum	
PS1		1400	1400	1360	1360	2800	
PS2		1400	1400	1360	1360	2800	
Switch#							

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)
```

Interface	Admin	Oper				(Watts)	Device			Class
				From	PS	To Device				
Fa3/1	auto	on		17 3		15.4	Ieee PD			0
Fa3/2		on								1
Fa3/3		on		7.1		6.3		Dhone	7960	_
Fa3/4		on		7.1		6.3				
Fa3/4 Fa3/5		on				15.4	Ieee PD	FIIOHE	7900	11/a 0
		on				15.4				0
										-
Fa3/7	auto	on		4.5		4.0	Ieee PD			1
Fa3/8		on		7.9		7.0	Ieee PD			2
Fa3/9	auto	on		17.3		15.4	Ieee PD			3
Fa3/10	auto	on		17.3		15.4	Ieee PD			4
Fa3/11	auto	off		0		0	n/a			n/a
Fa3/12	auto	off		0		0	n/a			n/a
Fa3/13	auto	off		0		0	n/a			n/a
Fa3/14	auto	off		0		0	n/a			n/a
Fa3/15	auto	off		0		0	n/a			n/a
Fa3/16	auto	off		0		0	n/a			n/a
Fa3/17	auto	off		0		0	n/a			n/a
Fa3/18	auto	off		0		0	n/a			n/a
							, -			, -
Totals:		10	on	117.	5	104.6				
				•	-					

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)

Interface Admin Oper	Power(Wa From PS To	tts) I Device	Device	Class
Fa3/1 auto on	11.2 10	.0	Ieee PD	0
Interface AdminPowerMax (Watts)	AdminConsumpti (Watts)	on		
Fa3/1 15.4 Switch#		10.0		



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# sl	now bowe	r detail
------------	----------	----------

			_	
sh	powe	r det	ail	

Power				Fan	Inline
Supply	Model No	Type	Status	Sensor	Status
PS1	PWR-C45-1400DC	DCSP1400W	good	good	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		Maximum
(in Watts)	Used	Available
System Power (12V)	360	360
Inline Power (-50V)	0	0
Backplane Power (3.3V)	0	40
Total	360	400

Moaute	Inline	. P	ower St	ımmary	(Watts
(12V ->	-48V	on	board	conver	sion)

		Maximum
Mod	Used	Available
1	5	25

		Watts Use	d of System Po	wer (12V)
Mod	Model	currently	out of reset	in reset
1	WS-X4013+TS	180	180	180
2	WS-X4506-GB-T	60	60	20
3	WS-X4424-GB-RJ45	90	90	50
	Fan Tray	30	==	
	Total	360	330	250

Watts used of Chassis Inline Power (-50V)
Inline Power Admin Inline Power Oper

		IIIIIIIe P	ower Admin	IIIIIIIe Po	wer Ober	
Mod	Model	PS	Device	PS	Device	Efficiency
2	WS-X4506-GB-T	0	0	0	0	89
3	WS-X4424-GB-RJ45	-	_	-	=	-
	Total	0	0	0	0	

Watts used o	of Module	Inline	Power	(12V	->	-50V)
Inline Power	r Admin	Inline F	Power (	)per		

_	MP-V4012+12	0	J	3	J	90
1	WS-X4013+TS	6	5	2	2	9.0
Mod	Model	PS	Device	PS	Device	Efficiency
		TIIT TIIC I	OWCI MUNITI	TITTIIC I	OWCI OPCI	

Switch#sh power module sh power module

		Watts Use	d of System Po	wer (12V)
Mod	Model	currently	out of reset	in reset
1	WS-X4013+TS	180	180	180
2	WS-X4506-GB-T	60	60	20
3	WS-X4424-GB-RJ45	90	90	50
	Fan Tray	30		
	Total	360	330	250

Watts used of Chassis Inline Power (-50V)
Inline Power Admin Inline Power Oper

Mod	Model	PS	Device	PS	Device	Efficiency
2	WS-X4506-GB-T	0	0	0	0	89
3	WS-X4424-GB-RJ45	_	_	_	_	_
	1					
	Total	0	0	0	0	

Watts used of Module Inline Power (12V -> -50V)

1	WS-X4013+TS	6	5	3	3	90
Mod	Model	PS 	Device	PS 	Device	Efficiency
		Inline P	ower Admin	Inline F	ower Oper	

Command	Description
power dc input	Configures the power DC input parameters on the switch.
power inline	Sets the inline-power state for the inline-power-capable interfaces.
power inline consumption	Sets the default power that is allocated to an interface for all the inline-power-capable interfaces on the switch.
power redundancy-mode	Configures the power settings for the chassis.

## 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.
n	(optional) Display PoE policing and monitoring status for all interfaces on this module.

#### Defaults

None

#### **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.

## **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 State	-	Admin Police	Oper Police	Cutoff Power	-
Gi2/1	auto	on	errdisable	ok	22.6	9.6

Command	Description
power inline police	Configures PoE policing on a particular interface.

# show pppoe intermediate-agent interface

To display PPPoE Intermediate Agent configuration and statistics (packet counters), use the **show pppoe intermediate-agent interface** command.

show ppoe intermediate-agent information interface interface

show ppoe intermediate-agent statistics interface 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
```

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
Switch#
```

Command	Description
pppoe intermediate-agent (global)	Enables the PPPoE Intermediate Agent feature on a switch.
pppoe intermediate-agent format-type (global)	Sets the access-node-identifier, generic-error-message, and identifier-string for the switch.
pppoe intermediate-agent (interface)	Enables the PPPoE Intermediate Agent feature on an interface.
pppoe intermediate-agent format-type (interface)	Sets circuit-id or remote-id for an interface.

# 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:

Switch# **show qos**QoS is enabled globally
Switch#

Command	Description
qos (global configuration mode)	Globally enables QoS functionality on the switch.
qos (interface configuration mode)	Enables QoS functionality on an interface.

## 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**

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.

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

Switch#

Policer aggr-1
Rate(bps):10000000 Normal-Burst(bytes):1000000
conform-action:transmit exceed-action:policed-dscp-transmit
Policymaps using this policer:
 ipp5-policy

Command	Description
qos aggregate-policer	Defines a named aggregate policer.

## 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**

Release	Modification
12.1(13)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 global DBL information:

```
Switch# show qos db1

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 DSCPs with default drop probability:

1-10

Switch#
```

Command	Description
qos (global configuration mode)	Globally enables QoS functionality on the switch.
qos dbl	Enables Dynamic Buffer Limiting (DBL) globally on the switch.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(13)EW	Added support for extended VLAN addresses.
12.1(19)EW	Display changed to include the Port Trust Device.

## **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

Tx-Queue	Bandwidth (bps)	ShapeRate (bps)	Priority	QueueSize (packets)
1	31250000	disabled	N/A	240
2	31250000	disabled	N/A	240
3	31250000	disabled	normal	240
4	31250000	disabled	N/A	240
Switch#				

Command	Description
qos map cos	Defines the ingress CoS-to-DSCP mapping for the trusted interfaces.
show qos	Displays QoS information.
tx-queue	Configures the transmit queue parameters for an interface.

## show qos maps

To display QoS map information, use the **show qos maps** command.

show qos maps [cos | dscp [policed | tx-queue]]

#### **Syntax Description**

cos	(Optional) Displays CoS map information.
dscp	(Optional) Displays DSCP map information.
policed	(Optional) Displays policed map information.
tx-queue	(Optional) Displays tx-queue map information.

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 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
     01 01 01 01 01 01 01 01 01 01
      01 01 01 01 01 01 02 02 02 02
 1:
      02 02 02 02 02 02 02 02 02 02
      02 02 03 03 03 03 03 03 03 03
      03 03 03 03 03 03 03 04 04
      04 04 04 04 04 04 04 04 04 04
      04 04 04 04
Policed DSCP Mapping Table (dscp = d1d2)
d1:d2 0 1 2 3 4 5 6 7
      00 01 02 03 04 05 06 07 08 09
0:
      10 11 12 13 14 15 16 17 18 19
1 :
      20 21 22 23 24 25 26 27 28 29
      30 31 32 33 34 35 36 37 38 39
      40 41 42 43 44 45 46 47 48 49
      50 51 52 53 54 55 56 57 58 59
```

60 61 62 63

Command	Description
qos (global configuration mode)	Globally enables QoS functionality on the switch.
qos (interface configuration mode)	Enables QoS functionality on an interface.

# 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**

Release	Modification
12.1.(13)EW	Support for this command was introduced on the Catalyst 4500 series switch (Catalyst 4507R only).
12.2(31)SGA	Support for ISSU was introduced.

#### **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
```

```
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Wed 14-Jul-04 04:42 by esi
                          BOOT = bootflash:cat4000-i5s-mz.122_20_EWA_392,1
        Configuration register = 0x2002
Peer Processor Information :
              Standby Location = slot 2
        Current Software state = STANDBY HOT
       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
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Wed 14-Jul-04 0
                          BOOT = bootflash:cat4000-i5s-mz.122_20_EWA_392,1
        Configuration register = 0x2002
Switch#
```

This example shows how to display redundancy facility client information:

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) seg=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=11
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_PROG_DONE(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_PROG_DONE(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#
```

Command	Description
redundancy	Enters the redundancy configuration mode.
redundancy force-switchover	Forces a switchover from the active to the standby supervisor engine.

# 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**

failures	Displays MCL entries or BEM/PRC failures.
ignored	Displays the ignored MCL entries.
bem	(Deprecated)
mcl	Displays commands that exist in the active supervisor engine's running configuration, but are not supported by the image on the standby supervisor engine.
prc	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.

#### **Defaults**

This command has no default settings.

#### **Command Modes**

User EXEC

## **Command History**

Release	Modification
12.2(31)SGA	This command was introduced on the Catalyst 4500 series switch.
12.2(44)SG	Updated command syntax from issu config-sync to redundancy config-sync.

## **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:

- **Step 1** Remove all mismatched commands from the active supervisor engines' running configuration.
- Step 2 Revalidate the MCL with a modified running configuration using the redundancy config-sync validate mismatched-commands command.
- **Step 3** Reload the standby supervisor engine.

Alternatively, you could ignore the MCL by following these steps:

- Step 1 Enter the redundancy config-sync ignore mismatched-commands command.
- **Step 2** Reload the standby supervisor engine; the system transitions to SSO mode.



If you ignore the mismatched commands, the *out-of-sync* configuration at the active supervisor engine and the standby supervisor engine still exists.

Step 3 You can verify the ignored MCL with the show redundancy config-sync ignored mcl command.

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 pro

PRC Failed Command List

-----

interface FastEthernet3/2

- ! <submode> "interface"
- channel-protocol pagp
- ! </submode> "interface"

Command	Description
redundancy config-sync	Moves the active supervisor engine into the Mismatched
mismatched-commands	Command List (MCL) and resets the standby supervisor
	engine.

# show running-config

To display the module status and configuration, use the **show running-config** command.

show running-config [module slot]

#### **Syntax Description**

<b>module</b> slot (Optional) Specifies the module slot number; valid values are from 1 to 6
----------------------------------------------------------------------------------------------

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**

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 consolesh runn
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
```

```
!
!
interface FastEthernet1
no ip address
shutdown
duplex auto
speed auto
Switch#
```

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 slavebootflash:

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

show slavebootflash: [all | chips | filesys]

#### **Syntax Description**

all	(Optional) Displays all possible Flash information.
chips	(Optional) Displays Flash chip information.
filesys	(Optional) Displays file system information.

#### **Defaults**

This command has no default settings.

#### **Command Modes**

**EXEC** 

#### **Command History**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **Examples**

This example shows how to display file system status information:

Switch# show slavebootflash: filesys

```
----- FILE SYSTEM STATUS-----
 Device Number = 0
DEVICE INFO BLOCK: bootflash
 Magic Number
                    = 6887635 File System Vers = 10000
                                                         (1.0)
                    = 1000000 Sector Size = 40000
 Length
 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
   Spares:
STATUS INFO:
 Writable
 NO File Open for Write
 Complete Stats
 No Unrecovered Errors
 No Squeeze in progress
USAGE INFO:
              = 917CE8 Bytes Available = 628318
 Bytes Used
 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-
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
                    = 1000000 Sector Size = 40000
                               Erased State
 Programming Algorithm = 39
                                               = FFFFFFFF
 File System Offset = 40000 Length = F40000
                               Length = C628
 MONLIB Offset
                     = 100
 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:
              = 917CE8 Bytes Available = 628318
 Bytes Used
 Bad Sectors = 0 Spared Sectors = 0
          = 2
                       Bytes = 917BE8
 OK Files
 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**

all	(Optional) Displays all Flash information including the output from the <b>show slot0: chips</b> and <b>show slot0: filesys</b> commands.
chips	(Optional) Displays Flash chip register information.
filesys	(Optional) Displays file system status information.

#### **Defaults**

This command has no default settings.

#### **Command Modes**

**EXEC** 

#### **Command History**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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
                                                BOB0
   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
   8 : B0B0 B0B0 B0B0 B0B0
                         B0B0 B0B0 B0B0
                                       B0B0
   16 : 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:
   8 : B0B0 B0B0 B0B0 B0B0
                         B0B0
                              B0B0 B0B0
                                       B0B0
           B0B0 B0B0
                     B0B0
   16:
      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:
   8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
   16 : B0B0 B0B0 B0B0 B0B0
                         B0B0
                              B0B0
                                  B0B0
                                       B0B0
   COMMON MEMORY REGISTERS: Bank 4
 Intelligent ID Code : FFFFFFF
   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
DEVICE INFO BLOCK: slot0
 Magic Number = 6887635 File System Vers = 10000
                    = 1000000 Sector Size = 20000
 Length
 Programming Algorithm = 4
                               Erased State
                                               = FFFFFFFF
 File System Offset = 20000 Length = FA0000
                              Length = F568
 MONLIB Offset = 100
 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:
              = 9F365C Bytes Available = 5AC9A4
 Bytes Used
             = 0
 Bad Sectors
                        Spared Sectors = 0
              = 1
                       Bytes = 9F35DC
 OK Files
 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**

all	(Optional) Displays all Flash information including the output from the <b>show slot0: chips</b> and <b>show slot0: filesys</b> commands.
chips	(Optional) Displays Flash chip register information.
filesys	(Optional) Displays file system status information.

#### **Defaults**

This command has no default settings.

#### **Command Modes**

**EXEC** 

## **Command History**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **Examples**

This example shows how to display a summary of the file system:

```
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:

```
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
```

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
   8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
   16 : 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:
   8 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
   16 : B0B0 B0B0 B0B0 B0B0
                            B0B0 B0B0 B0B0
                                           B0B0
   24 : 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:
   8 : B0B0 B0B0 B0B0 B0B0
                            B0B0 B0B0 B0B0
                                           B0B0
   16 : B0B0 B0B0 B0B0 B0B0 B0B0 B0B0 B0B0
   24 : B0B0 B0B0 B0B0 B0B0
                            B0B0 B0B0 B0B0 B0B0
COMMON MEMORY REGISTERS: Bank 4
 Intelligent ID Code : FFFFFFF
   IID Not Intel -- assuming bank not populated
This example shows how to display file system information:
Switch# show slot0: filesys
-----FILE SYSTEM STATUS-----
 Device Number = 0
DEVICE INFO BLOCK: slot0
 Magic Number = 6887635 File System Vers = 10000
                   = 1000000 Sector Size = 20000
 Length
 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:
             = 9F365C Bytes Available = 5AC9A4
 Bytes Used
            = 0
 Bad Sectors
                      Spared Sectors = 0
             = 1
                      Bytes = 9F35DC
 OK Files
 Deleted Files = 0
                      Bytes = 0
 Files w/Errors = 0
                      Bvtes = 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 <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>port-channel</b> (1 to 64), and <b>vlan</b> (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.		
iviai	(Optional) Displays the total lines of the spanning-tree state section.		
uplinkfast	(Optional) Displays the total lines of the spanning-tree state section.  (Optional) Displays the spanning-tree UplinkFast status.		
	<u> </u>		
uplinkfast	(Optional) Displays the spanning-tree UplinkFast status.		
uplinkfast vlan vlan_id	(Optional) Displays the spanning-tree UplinkFast status.  (Optional) Specifies the VLAN ID; valid values are from 1 to 4094.		

## Defaults

Interface information summary is displayed.

## **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.
12.1(12c)EW	Support for extended addressing was added.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

## **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 129.9.
   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 BPDUs received (all VLANs) : 0

Number of RLQ request PDUs received (all VLANs) : 0

Number of RLQ response PDUs received (all VLANs) : 0

Number of RLQ request PDUs sent (all VLANs) : 0

Number of RLQ response PDUs sent (all VLANs) : 0

Switch#
```

This example shows how to display spanning-tree information for the bridge:

#### Switch# show spanning-tree bridge

```
VI.AN1
 Bridge ID Priority
                       0050.3e8d.6401
            Address
            Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
VLAN2
                     32768
 Bridge ID Priority
            Address
                      0050.3e8d.6402
            Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
VI.AN3
 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

```
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
                     0030.94fc.0a00
           Address
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
           Aging Time 300
Interface
                                           Designated
Name
                   Port ID Prio Cost Sts Cost Bridge 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
 Bridge ID Priority 32768
                     0030.94fc.0a01
           Address
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
           Aging Time 300
Interface
                                           Designated
                    Port ID Prio Cost Sts Cost Bridge ID
Name
                                                                 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

#### 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
```

Name		Blocking	Listenin	ıg Learnıng	g Forwarding	STP Activ	e
VLAN1		0	0	0	1	1	
VLAN2		0	0	0	1	1	
	2 VLANs 0	0		0 2	2	2	
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
```

Name			Block	ing	Listeni	ng	Learning	Forwarding	STP	Active
	2	VLANs	0	0		0	2	2		
Switch#										

This example shows how to determine whether any ports are in root inconsistent state:

Switch# show spanning-tree inconsistentports

Name	Interface	Inconsistency
VLAN1	FastEthernet3/1	Root Inconsistent
Number of in	nconsistent ports (segments	) in the system:1

Command	Description
spanning-tree backbonefast	Enables BackboneFast on a spanning-tree VLAN.
spanning-tree cost	Calculates the path cost of STP on an interface.
spanning-tree guard	Enables root guard.
spanning-tree pathcost method	Sets the path cost calculation method.
spanning-tree portfast default	Enables PortFast by default on all access ports.
spanning-tree portfast (interface configuration mode)	Enables PortFast mode.
spanning-tree port-priority	Prioritizes an interface when two bridges compete for position as the root bridge.
spanning-tree uplinkfast	Enables the UplinkFast feature.
spanning-tree vlan	Configures STP on a per-VLAN basis.

# 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**

configuration	(Optional) Displays region configuration information.
instance-id	(Optional) Instance identification number; valid values are from 0 to 15.
detail	(Optional) Displays detailed MST protocol information.
interface interface	(Optional) Interface type and number; valid values for type are <b>fastethernet</b> , <b>gigabitethernet</b> , <b>tengigabitethernet</b> , <b>port-channel</b> , and <b>vlan</b> . See the "Usage Guidelines" section for more information.

#### **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.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

#### **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:

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
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#
```

Command	Description
spanning-tree mst	Sets the path cost and port-priority parameters for any MST instance.
spanning-tree mst forward-time	Sets the forward delay timer for all the instances.
spanning-tree mst hello-time	Sets the hello-time delay timer for all the instances.
spanning-tree mst max-hops	Specifies the number of possible hops in the region before a BPDU is discarded.
spanning-tree mst root	Designates the primary root.

## show storm-control

To display the broadcast storm control settings on the switch or on the specified interface, use the **show storm-control** command.

#### Non-Supervisor Engine 6-E

show storm-control [interface-id | broadcast]

## Supervisor Engine 6-E and Catalyst 4900M chassis

**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.

#### **Command Modes**

Privileged EXEC mode

## **Command History**

Release	Modification
12.1(19)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.
12.2(40)SG	Added support for the Supervisor Engine 6-E and Catalyst 4900M chassis.

#### **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.

## 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.

This is an example of output from the **show storm-control** command on a Supervisor Engine 6-E when no keywords are entered.

Switch# sh	ow storm-control			
Interface	Filter State	Broadcast	Multicast	Level
Fa6/1	Blocking	Enabled	Disabled	81%
Fa6/2	Blocking	Enabled	Enabled	61%
Switch#				

This is an example of output from the **show storm-control** command for a specified interface.

Switch# sh	ow storm-contro	l fasteth	ernet2/17
Interface	Filter State	Level	Current
Fa2/17	Forwarding	50.00%	0.00%
Switch#			

This is an example of output from the **show storm-control** command for a specified interface on a Supervisor Engine 6-E.

Switch# <b>sh</b>	ow storm-contro	1 interfac	e fastethern	et6/1
Interface	Filter State	Broadcast	Multicast	Level
Fa6/1	Blocking	Enabled	Disabled	81%
Switch#				

Table 2-29 describes the fields in the **show storm-control** display.

Table 2-29 show storm-control Field Descriptions

Field	Description
Interface	Displays the ID of the interface.
Filter State	Displays the status of the filter:
	• Blocking—Storm control is enabled, and a storm has occurred.
	• Forwarding—Storm control is enabled, and no storms have occurred.
	• Inactive—Storm control is disabled.
Level	Displays the threshold level set on the interface for broadcast traffic.
Current	Displays the bandwidth utilization of broadcast traffic as a percentage of total available bandwidth. This field is valid only when storm control is enabled.
	<b>Note</b> N/A is displayed for interfaces that do storm control in the hardware.

Command	Description
storm-control	Enables broadcast storm control on a port and specifies
	what to do when a storm occurs on a port.

Command	Description
show interfaces counters	Displays the traffic on the physical interface.
show running-config	Displays the running configuration of a switch.

# 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** 

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 global MTU setting:

Switch# show system mtu

Global Ethernet MTU is 1550 bytes.

Switch#

Command	Description
system mtu	Sets the maximum Layer 2 or Layer 3 payload size.

# 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**

Release	Modification
12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.

#### **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 sub-command 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** command.

show udld interface-id

#### **Syntax Description**

interface-id	Name of the interface.

#### **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(25)EW	Added support for the 10-Gigabit Ethernet interface.

## **Usage Guidelines**

If you do not enter an interface ID value, the administrative and operational UDLD status for all interfaces is displayed.

## **Examples**

This example shows how to display the UDLD state for Gigabit Ethernet interface 2/2:

```
Switch# show udld gigabitethernet2/2
Interface Gi2/2
Port enable administrative configuration setting: Follows device default
Port enable operational state: Enabled
Current bidirectional state: Bidirectional
Current operational state: Advertisement
Message interval: 60
Time out interval: 5
No multiple neighbors detected
   Entry 1
    Expiration time: 146
    Device ID: 1
    Current neighbor state: Bidirectional
    Device name: 0050e2826000
    Port ID: 2/1
   Neighbor echo 1 device: SAD03160954
    Neighbor echo 1 port: Gi1/1
   Message interval: 5
   CDP Device name: 066527791
Switch#
```

Command	Description
udld (global configuration mode)	Enables aggressive or normal mode in the UDLD protocol and sets the configurable message timer time.
udld (interface configuration mode)	Enables UDLD on an individual interface or prevents a fiber interface from being enabled by the <b>udld</b> ( <b>global configuration mode</b> ) command.

## 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**

brief	(Optional) Displays only a single line for each VLAN, naming the VLAN, status, and ports.	
id vlan_id	(Optional) Displays information about a single VLAN identified by VLAN ID number; valid values are from 1 to 4094.	
name name	(Optional) Displays information about a single VLAN identified by VLAN name; valid values are an ASCII string from 1 to 32 characters.	
private-vlan	Displays private VLAN information.	
type	(Optional) Private VLAN type.	

## 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.
12.1(12c)EW	Added support for extended VLAN addresses.

## 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...>

917 999 1002 1003 1004	fddi-d trcrf- fddin	917			act: act: act:	ive ive ive ive	Fa5/9 Fa5/9 Fa5/9 Fa5/9 Fa5/9 Fa5/9			
VLAN	Туре	SAID	MTU	Parent	RingNo	Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500		_	_		_	0	0
2	enet	100001	1500		_	_	_	_	0	0
3	enet	100003	1500		_	_	_	_	303	0
4	enet	100004	1500		_	_	_	_	304	0
5	enet	100005	1500	_	_	_	-	_	305	0
6	enet	100006	1500	-	-	_	_	_	0	0
10	enet	100010	1500	-	-	-	-	_	0	0
20	enet	100020	1500	-	-	-	-	_	0	0
50	enet	100050	1500	-	-	-	-	-	0	0
<(	<output truncated=""></output>									
850	enet	100850	1500	_	_	_	_	_	0	0
917	enet	100917	1500	-	_	-	_	_	0	0
999	enet	100999	1500	-	-	-	-	_	0	0
1002	fddi	101002	1500	-	0	-	-	_	0	0
1003	trcrf	101003	4472	1005	3276	-	-	srb	0	0
1004	fdnet	101004	1500	-	-	-	ieee	_	0	0
1005	trbrf	101005	4472	_	-	15	ibm	-	0	0
VLAN	AREHo]	os STEHops	Backup	CRF						
802	0	0	off							
1003			off							
Swite	ch#									

## This example shows how to display the VLAN name, status, and associated ports only:

#### Switch# show vlan brief

VLAN Name	Status	Ports
4 16 1.		
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
10 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

```
VLAN Name Status Ports

3 VLAN0003 active Fa5/9

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2

--- --- --- --- --- --- --- 303 0

Switch#
```

Table 2-30 describes the fields in the **show vlan** command output.

Table 2-30 show vlan Command Output Fields

Field	Description		
VLAN	VLAN number.		
Name	Name, if configured, of the VLAN.		
Status	Status of the VLAN (active or suspend).		
Ports	Ports that belong to the VLAN.		
Type	Media type of the VLAN.		
SAID	Security Association Identifier value for the VLAN.		
MTU	Maximum transmission unit size for the VLAN.		
Parent	Parent VLAN, if one exists.		
RingNo	Ring number for the VLAN, if applicable.		
BrdgNo	Bridge number for the VLAN, if applicable.		
Stp	Spanning Tree Protocol type used on the VLAN.		

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

```
Primary Secondary Type Ports
-----
10 100 community Fa3/1, Fa3/2
```

Now, let's say that you remove the VLAN association, as follows:

You can use the following command to verify PVLAN configuration on the interface:

Switch# show interface f3/2 status

Port Name Status Vlan Duplex Speed Type

Fa3/2 connected pvlan seco 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

Switch#

Command	Description
vlan (VLAN Database mode)	Configures a specific VLAN.
vlan database	Enters VLAN configuration mode.
vtp (global configuration mode)	Modifies the name of a VTP configuration storage file.

# 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]

## **Syntax Description**

map-name (	(Optional) Name	of the VLAN	access map.

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 command shows how to display the contents of a VLAN access map:

Switch# show vlan access-map mordred

Vlan access-map "mordred" 1
match: ip address 13
action: forward capture

Switch#

Command	Description
vlan access-map	Enters VLAN access-map command mode to create a
	VLAN access map.

## show vlan counters

To display the software-cached counter values, use the **show vlan counters** command.

show vlan [id vlanid] counters

## **Syntax Description**

id vlanid	(Optional) Displays the software-cached counter values for a specific VLA	۱N.
-----------	---------------------------------------------------------------------------	-----

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 switches.

## **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>		

Command	Description
clear vlan counters	Clears the software-cached counter values to start from
	zero again for a specified VLAN or all existing VLANs.

# 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.

#### **Command Modes**

User EXEC

## **Command History**

Release	Modification
12.1(18)EW	This command was introduced on the Catalyst 4500 series switch.

## **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

Port	Operational	Native VLAN
	Mode	Tagging State
f3/2	trunk	enabled
f3/16	PVLAN trunk	disabled
f3/16	trunk	enabled

Command	Description
switchport mode	Sets the interface type.
vlan (global configuration) (refer to Cisco IOS documentation)	Enters global VLAN configuration mode.
vlan (VLAN configuration) (refer to Cisco IOS documentation)	Enters VLAN configuration mode.

# 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**

id vlan-id	(Optional) Displays internal VLAN allocation information for the specified VLAN;
	valid values are from 1 to 4094.

Defaults

This command has no default settings.

**Command Modes** 

Privileged EXEC mode

## **Command History**

Release	Modification
12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

## **Examples**

This example shows how to display information about the current internal VLAN allocation:

Switch# show vlan internal usage

This example shows how to display information about the internal VLAN allocation for a specific VLAN:

 ${\tt Switch\#}$  show vlan id 1030 internal usage

VLAN Usage
---1030 GigabitEthernet1/2

Command	Description
vlan internal allocation policy	Configures the internal VLAN allocation scheme.

## show vlan mtu

To display the minimum and maximum transmission unit (MTU) sizes of each VLAN, use the **show vlan mtu** command.

## show vlan mtu

## **Syntax Description**

This command has no arguments or keywords

#### **Defaults**

This command has no default settings.

### **Command Modes**

**EXEC** 

### **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
Switc	ch>			

Command	Description	
mtu	Enables jumbo frames on an interface by adjusting the maximum size of a packet or maximum transmission unit (MTU).	

# show vlan private-vlan

To display private VLAN information, use the show vlan private-vlan command.

show vlan private-vlan [type]

## **Syntax Description**

type	(Optional) Displays the private VLAN type; valid types are isolated, primary,
community, nonoperational, and normal.	

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.

## **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	Туре	Ports
2	301	community	Fa5/3, Fa5/25
2	302	community	
	10	community	
100	101	isolated	
150	151	non-operational	
	202	community	
	303	community	
401	402	non-operational	
Switch#			



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 2-31 describes the fields in the show vlan private-vlan command output.

Table 2-31 show vlan private-vlan Command Output Fields

Field	Description	
Primary	Number of the primary VLAN.	
Secondary	Number of the secondary VLAN.	
Secondary-Type	Secondary VLAN type is isolated or community.	
Ports	Indicates the ports within a VLAN.	
Туре	Type of VLAN; possible values are <b>primary, isolated</b> , community, nonoperational, or <b>normal</b> .	

Command	Description
private-vlan	Configures private VLANs and the association between a private VLAN and a secondary VLAN.
private-vlan mapping	Creates a mapping between the primary and the secondary VLANs so that both share the same primary VLAN SVI.

# 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** 

Release	Modification
12.1(12)EW	This command was introduced on the Catalyst 4500 series switches.

## Examples

This example shows how to display a list of RSPAN VLANs:

Router# show vlan remote-span

Remote SPAN VLANs

-----

2,20

Command	Description
remote-span	Converts a VLAN into an RSPAN VLAN.
vlan (VLAN Database mode)	Configures a specific VLAN.

## 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	Heer	rıntını
OVIILUA	D 6 3 6	IIDUIUII

statistics (O	ptional) Dist	plays the clien	t-side statistics.
---------------	---------------	-----------------	--------------------

#### **Defaults**

This command has no default settings.

### **Command Modes**

**EXEC** 

## **Command History**

Release	Modification	
12.1(13)EW	Support for this command was introduced on the Catalyst 4500 series switch.	

### **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#
```

Command	Description
vmps reconfirm (privileged EXEC)	Sends VLAN Query Protocol (VQP) queries to reconfirm all the dynamic VLAN assignments with the VLAN Membership Policy Server (VMPS).

## show vtp

To display VTP statistics and domain information, use the **show vtp** command.

show vtp {counters | status}

### **Syntax Description**

counters	Specifies the VTP statistics.	
status	Specifies the VTP domain status.	

#### 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.

#### **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

```
MD5 digest : 0xE6\ 0xF8\ 0x3E\ 0xDD\ 0xA4\ 0xF5\ 0xC2\ 0x0E Configuration last modified by 172.20.52.18 at 9-22-99 11:18:20 Local updater ID is 172.20.52.18 on interface Vl1 (lowest numbered VLAN interface found) Switch#
```

This example shows how to display only those lines in the **show vtp** output that contain the word Summary:

Table 2-32 describes the fields in the **show vtp** command output.

Table 2-32 show vtp Command Output Fields

Field	Description
Summary advertisements received	Total number of summary advertisements received.
Subset advertisements received	Total number of subset advertisements received.
Request advertisements received	Total number of request advertisements received.
Summary advertisements transmitted	Total number of summary advertisements transmitted.
Subset advertisements transmitted	Total number of subset advertisements transmitted.
Request advertisements transmitted	Total number of request advertisements transmitted.
Number of config revision errors	Number of config revision errors.
Number of config digest errors	Number of config revision digest errors.
Number of V1 summary errors	Number of V1 summary errors.
Trunk	Trunk port participating in VTP pruning.
Join Transmitted	Number of VTP-Pruning Joins transmitted.
Join Received	Number of VTP-Pruning Joins received.
Summary advts received from non-pruning-capable device	Number of Summary advertisements received from nonpruning-capable devices.
Number of existing VLANs	Total number of VLANs in the domain.
Configuration Revision	VTP revision number used to exchange VLAN information.
Maximum VLANs supported locally	Maximum number of VLANs allowed on the device.
Number of existing VLANs	Number of existing VLANs.
VTP Operating Mode	Indicates whether VTP is enabled or disabled.
VTP Domain Name	Name of the VTP domain.
VTP Pruning Mode	Indicates whether VTP pruning is enabled or disabled.
VTP V2 Mode	Indicates the VTP V2 mode as server, client, or transparent.
VTP Traps Generation	Indicates whether VTP trap generation mode is enabled or disabled.
MD5 digest	Checksum values.

Command	Description	
vtp (global configuration mode)	Modifies the name of a VTP configuration storage file.	
vtp client	Places a device in VTP client mode.	
vtp domain	Configures the administrative domain name for a device.	
vtp password	Creates a VTP domain password.	
vtp pruning	Enables pruning in the VLAN database.	
vtp server	Places the device in VTP server mode.	
vtp transparent	Places device in VTP transparent mode.	
vtp v2-mode	Enables version 2 mode.	

show vtp