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

interface	(Optional) Interface type; valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **and port-channel**.
interface-number	(Optional) Interface number.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(19)EW	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 The following example shows how to display the ACL configuration on the Fast Ethernet interface 6/1:

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

Related Commands

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

Command Default   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.

- 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   The following example shows how to display adjacency information:

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

The following 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#
```

The following example shows how to display protocol detail and timer information:

```
Switch# show adjacency detail
Protocol Interface           Address
IP      FastEthernet2/3      172.20.52.1(3045)
                             0 packets, 0 bytes
                             000000000FF920000380000000000000
                             00000000000000000000000000000000
                             00605C865B2800D0BB0F980B0800
                             ARP        03:58:12
IP      FastEthernet2/3      172.20.52.22(11)
                             0 packets, 0 bytes
                             000000000FF920000380000000000000
                             00000000000000000000000000000000
                             00801C93804000D0BB0F980B0800
                             ARP        03:58:06
Switch#
```

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

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

Related Commands

Command	Description
debug adjacency	Displays information about the adjacency debugging.

show ancp multicast

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

show ancp multicast [**group** *groupaddr*] [**source** *sourceaddr*] | [**interface** *interfacename*]

Syntax Description

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

Command Default   Displays all the multicast streams activated with ANCP.

Command Modes   Privileged EXEC

Command History

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

Examples   The following 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
0x01060004000A0704 10 Fa7/4 18:25:43 UTC Sat Sep 13 2008
0x0106000400140704 20 Fa7/4 18:25:43 UTC Sat Sep 13 2008
ANCP-Client#
```

show arp access-list

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

show arp access-list

Syntax Description   This command has no arguments or keywords.

Command Default   This command has no default settings.

Command Modes   EXEC

Command History

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

Examples   The following example shows how to display the ARP ACL information for a switch:

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

Related Commands

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** *interface* | **registrations** | **sessions** [**session-id** *session-id*] [**handle** *handle*] [**interface** *interface*] [**mac** *mac*] [**method** *method*] [**interface** *interface* [**details** | **policy**]]

Syntax Description

interface *interface*	Displays all of the Auth Manager details associated with the specified interface.
registrations	Displays details of all methods registered with the Auth Manager.
sessions	Displays details of the current Auth Manager sessions (for example, client devices). If you do not enter any optional specifiers, all current active sessions are displayed. You can enter the specifiers singly or in combination to display a specific session (or group of sessions).
session-id *session-id*	(Optional) Specifies an Auth Manager session.
handle *handle*	(Optional) Specifies the particular handle for which Auth Manager information is displayed. Range is 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**
interface *interface* **details**	(Optional) Displays detailed information.
interface *interface* **policy]**	(Optional) Displays policies applied on the interface.

Command Default   This command has no default settings.

Command Modes   EXEC

Command History

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

Usage Guidelines   Do not enter the **show authentication sessions** and the **clear authentication sessions** commands in succession and repeatedly - it causes the switch to shutdown. These commands must not be used this way in scripts either. If you have to enter the commands again, wait for one minute between repetitions.

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

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

Table 2-19   show authentication Command Output

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

Table 2-20   State Method Values

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   09081404000000007003651EC
Gi3/46     (unknown)      N/A      DATA      Authz Success  09081404000000080057C274
```

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

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

Runnable methods list:
      Method    State
      dot1x     Failed over
```

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

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

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

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

The following example displays the policies applied on interface e0/0:

```
AUTH# show authentication sessions interface e0/0 policy
            Interface:  Ethernet0/0
          MAC Address:  aabb.cc01.ff00
         IPv6 Address:  Unknown
         IPv4 Address:  Unknown
            User-Name:  gupn
               Status:  Authorized
               Domain:  DATA
      Security Policy:  Should Secure
      Security Status:  Unsecure
       Oper host mode:  multi-host
      Oper control dir:  both
       Session timeout:  N/A
     Common Session ID:  0D0102330000000D0003329A
       Acct Session ID:  Unknown
               Handle:  0x6F000002
       Current Policy:  POLICY_Et0/0

Local Policies:
        Template: SVC_1 (priority 10)
         Idle timeout:  500 sec
                  TAG:  blue
         URL Redirect:  www.a.com
     URL Redirect ACL:  a

        Template: SVC_3 (priority 20)
         Idle timeout:  300 sec
                  TAG:  red
         URL_Redirect:  www.b.com
     URL-Redirect ACL:  b

Server Policies:
         Idle timeout:  800 sec


Resultant policies:
         Idle timeout:  500 sec
                  TAG:  blue
         URL Redirect:  www.a.com
     URL Redirect ACL:  a
                  TAG:  red

Method status list:
       Method          State
       dot1x           Authc Success
```

Related Commands

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.

Command	Description
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 port-control	Configures the port-control value.
authentication priority	Specifies the priority of authentication methods on an interface.
authentication timer	Configures the authentication timer.
authentication violation	Specifies the action to be taken when a security violation exists on a port.

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.2(20)EW	This command was introduced on the Catalyst 4500 series switch.

Examples   The following 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	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 qos**
- **show qos map**
- **show qos interface** *interface-id*
- **show running-config**

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

Examples   The following example shows output from the **show auto qos** command when auto-QoS is enabled:

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

Related Commands

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

show auto security

To display the auto security (configuration), use the **show auto security** command.

>**show auto security [configuration]**

Syntax Description

configuration	Displays the CLIs that are applied with AS.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
3.6.0E	This command was introduced on the Catalyst 4500 series switch.

Examples   The following example shows the output of the **show auto security** command when AS is disabled globally:

```
Switch# show auto  security
Auto Secure is Disabled globally

AutoSecure is Enabled on below interface(s):
------------------------------------------
  none
Switch#
```

The following example shows how to enable auto security on an uplink port:

```
Switch# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# int g1/0/15
Switch(config-if)# auto security-port uplink
Switch(config-if)# end
Switch# sh auto security
Auto Secure is Enabled globally

AutoSecure is Enabled on below interface(s):
------------------------------------------
  GigabitEthernet1/0/2
  GigabitEthernet1/0/3
  GigabitEthernet1/0/15
```

The following example shows how to enable auto security on an access port:

```
Switch# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# int g1/0/18
Switch(config-if)# auto security-port host
Switch(config-if)# end
Switch#
Apr  5 22:16:41.725: %SYS-5-CONFIG_I: Configured from console by consolesh auto security
```

```
Switch# show auto security
Auto Secure is Enabled globally

AutoSecure is Enabled on below interface(s):
-------------------------------------------
   GigabitEthernet1/0/2
   GigabitEthernet1/0/3
   GigabitEthernet1/0/15
   GigabitEthernet1/0/18
```

The following example shows how to display the CLIs that are applied with AS:

```
Switch# show auto security configuration
%AutoSecure provides a single CLI config 'auto secure'
 to enable Base-line security Features like
 DHCP snooping, ARP inspection and  Port-Security

Auto Secure CLIs applied globally:
-------------------------------
ip dhcp snooping
ip dhcp snooping vlan 2-1005
no ip dhcp snooping information option
ip arp inspection vlan 2-1005


Auto Secure CLIs applied on Access Port:
---------------------------------------
switchport port-security maximum 2
switchport port-security maximum 1 vlan access
switchport port-security maximum 1 vlan voice
switchport port-security violation restrict
switchport port-security aging time 2
switchport port-security aging type inactivity
switchport port-security
ip arp inspection limit rate 100
ip dhcp snooping limit rate 100


Auto Secure CLIs applied on Trunk Port:
-------------------------------------
ip dhcp snooping trust
ip arp inspection trust
switchport port-security maximum 100
switchport port-security violation restrict
switchport port-security
```

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.

Command Default   This command has no default settings.

Command Modes   EXEC

Command History

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

Examples   The following example shows how to display file system status information:

```
Switch> show bootflash: filesys

-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 0
DEVICE INFO BLOCK: bootflash
  Magic Number       = 6887635    File System Vers = 10000    (1.0)
  Length             = 1000000    Sector Size      = 40000
  Programming Algorithm = 39      Erased State     = FFFFFFFF
  File System Offset  = 40000     Length = F40000
  MONLIB Offset       = 100       Length = C628
  Bad Sector Map Offset = 3FFF8   Length = 8
  Squeeze Log Offset  = F80000    Length = 40000
  Squeeze Buffer Offset = FC0000  Length = 40000
  Num Spare Sectors   = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
  Bytes Used    = 917CE8   Bytes Available = 628318
  Bad Sectors   = 0        Spared Sectors  = 0
  OK Files      = 2        Bytes = 917BE8
  Deleted Files = 0        Bytes = 0
  Files w/Errors = 0       Bytes = 0
Switch>
```

The following 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>
```

The following example shows how to display all bootflash information:

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

6456088 bytes available (9534696 bytes used)

-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 0
DEVICE INFO BLOCK: bootflash
  Magic Number       = 6887635   File System Vers = 10000    (1.0)
  Length             = 1000000   Sector Size      = 40000
  Programming Algorithm = 39     Erased State     = FFFFFFFF
  File System Offset = 40000     Length = F40000
  MONLIB Offset      = 100       Length = C628
  Bad Sector Map Offset = 3FFF8  Length = 8
  Squeeze Log Offset = F80000    Length = 40000
  Squeeze Buffer Offset = FC0000 Length = 40000
  Num Spare Sectors  = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
  Bytes Used    = 917CE8  Bytes Available = 628318
  Bad Sectors   = 0       Spared Sectors  = 0
  OK Files      = 2       Bytes = 917BE8
  Deleted Files = 0       Bytes = 0
  Files w/Errors = 0      Bytes = 0
Switch>
```

show bootvar

To display BOOT environment variable information, use the **show bootvar** command.

> **show bootvar**

Syntax Description   This command has no arguments or keywords.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following example shows how to display BOOT environment variable information:

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

show cable-diagnostics tdr

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

> **show cable-diagnostics tdr** {**interface** {*interface interface-number*}}

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

Syntax Description

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

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.2(25)SG	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 The following example shows how to display information about the TDR test:

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

Table 2-21 describes the fields in the **show cable-diagnostics tdr** command output.

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

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)

Related Commands

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

show call-home

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

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

Syntax Description		
alert-group	(Optional) Displays the available alert group.	
detail	(Optional) Displays the CallHome configuration in detail.	
mail-server	(Optional) Displays the CallHome mail server-related information.	
profile all	(Optional) Displays configuration information for all existing profiles.	
profile *name*	(Optional) Displays configuration information for a specific destination profile.	
statistics	(Optional) Displays the CallHome statistics.	

Command Default   This command has no default settings.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
12.2(52)SG	This command was introduced on the Catalyst 4500 series switch, Supervisor Engine 6-E, and Catalyst 4900M chassis.

Examples   The following example displays the configured CallHome settings:

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

    vrf for call-home messages: Not yet set up

    contact person's email address: technical@example.com

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

```
Available alert groups:
    Keyword                 State   Description
    ----------------------- ------- --------------------------------
    configuration           Disable configuration info
    diagnostic              Disable diagnostic info
    environment             Disable environmental info
    inventory               Enable  inventory info
    syslog                  Disable syslog info

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

Switch#
```

Configured CallHome Information in Detail

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

    vrf for call-home messages: Not yet set up

    contact person's email address: technical@example.com

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

Available alert groups:
    Keyword                 State   Description
    ----------------------- ------- --------------------------------
    configuration           Disable configuration info
    diagnostic              Disable diagnostic info
    environment             Disable environmental info
    inventory               Enable  inventory info
    syslog                  Disable syslog info

Profiles:

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

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

    Syslog-Pattern          Severity
    ----------------------- ------------
    N/A                     N/A

Profile Name: CiscoTAC-1
    Profile status: ACTIVE
    Preferred Message Format: xml
```

```
                   Message Size Limit: 3145728 Bytes
                   Transport Method: email
                   Email address(es): callhome@cisco.com
                   HTTP  address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService

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

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

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

                   Syslog-Pattern          Severity
                   ----------------------  ------------
                   .*                      major
            Switch#
```

Available Call Home Alert Groups

```
Switch# show call-home alert-group
Available alert groups:
    Keyword                 State   Description
    ----------------------  ------- --------------------------------
    configuration           Disable configuration info
    diagnostic              Disable diagnostic info
    environment             Disable environmental info
    inventory               Enable  inventory info
    syslog                  Disable syslog info

Switch#
```

E-Mail Server Status Information

```
Switch# show call-home mail-server status
Please wait. Checking for mail server status ...

Translating "smtp.example.com"
    Mail-server[1]: Address: smtp.example.com Priority: 1 [Not Available]
    Mail-server[2]: Address: 192.168.0.1 Priority: 2 [Not Available]

Switch#
```

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

```
Switch# show call-home profile all

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

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

    Syslog-Pattern          Severity
    ----------------------  ------------
    N/A                     N/A
```

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

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

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

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

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

Switch#
```

Information for a User-Defined Destination Profile

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

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

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

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

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

Call Home Statistics

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

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

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

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

        Last call-home message sent time: n/a
```

Related Commands

Command	Description
call-home (global configuration)	Enters call-home configuration mode.
call-home send alert-group	Sends a specific alert group message.
service call-home (refer to Cisco IOS documentation)	Enables or disables call home.

show cdp neighbors

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

> **show cdp neighbors** [*type number*] [**detail**]

Syntax Description

type	(Optional) Interface type that is connected to the neighbors about which you want information; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **port-channel**, and **vlan**.
number	(Optional) Interface number that is connected to the neighbors about which you want information.
detail	(Optional) Displays detailed information about a neighbor (or neighbors) including network address, enabled protocols, hold time, and software version.

Command Default

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

The following example shows how to display the information about the CDP neighbors:

```
Switch# show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID       Local 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-telcoFas 0/0
008024 2758E0   Eth 0            132            T        CAT3000   1/2
Switch#
```

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

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

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.

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

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

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

advertisement version: 2
Duplex: half

-------------------------
Device ID: lab-as5300-1
Entry address(es):
  IP address: 172.19.169.87
.
.
.
Switch#
```

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

Table 2-23   *show cdp neighbors detail Field Descriptions*

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.

Related Commands

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

class_name	Name of the class map.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
12.2(25)SG	Displays results from the full-flow option.

Examples   The following 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#
```

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

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

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

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

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

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

```
Switch# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# class-map c1
Switch(config-cmap)# match flow ip source-address ip destination-address ip protocol l4
source-port l4 destination-port
Switch(config-cmap)# exit
Switch(config)# policy-map p1
Switch(config-pmap)# class c1
Switch(config-pmap-c)# police 1000000 9000
Switch(config-pmap-c)# exit
Switch(config-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 l4 source-port l4
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 l4 source-port l4
destination-port
Switch#
```

Related Commands

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 device-sensor cache

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

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

Syntax Description

mac *mac-address*	Specifies the MAC address of the device for which the sensor cache entries are to be displayed.
all	Displays sensor cache entries for all devices.

Command Default   There are no defaults for this command.

Command Modes   Privileged EXEC

Command History

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

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

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

```
Router# show device-sensor cache mac 0024.14dc.df4d

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

```
dhcp    57:max-message-size         4 39 02 04 80
```

The following is sample output from the **show device-sensor cache all** command:

```
Router# show device-sensor cache all

Device: 001c.0f74.8480 on port GigabitEthernet2/1
--------------------------------------------------
Proto   Type:Name                   Len  Value
dhcp    52:option-overload          3  34 01 03
dhcp    60:class-identifier         11 3C 09 64 6F 63 73 69 73 31 2E 30
dhcp    55:parameter-request-list   8  37 06 01 42 06 03 43 96
dhcp    61:client-identifier        27 3D 19 00 63 69 73 63 6F 2D 30 30 31 63 2E 30 66
                                        37 34 2E 38 34 38 30 2D 56 6C 31
dhcp    57:max-message-size         4  39 02 04 80

Device: 000f.f7a7.234f on port GigabitEthernet2/1
--------------------------------------------------
Proto   Type:Name                   Len  Value
cdp     22:mgmt-address-type        8  00 16 00 08 00 00 00 00
cdp     19:cos-type                 5  00 13 00 05 00
cdp     18:trust-type               5  00 12 00 05 00
cdp     11:duplex-type              5  00 0B 00 05 01
cdp     10:native-vlan-type         6  00 0A 00 06 00 01
cdp      9:vtp-mgmt-domain-type     9  00 09 00 09 63 69 73 63 6F
```

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

Field	Description
Device	MAC address of the device and the interface which it is connected to.
Proto	Protocol from which the endpoint device data is being gleaned.
Type	Type of TLV.
Name	Name of the TLV.
Len	Length of the TLV.
Value	Value of the TLV.

Related Commands

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

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.

Command Default This command has no default settings.

Command Modes EXEC

Command History	Release	Modification
	12.2(20)EWA	This command was introduced on the Catalyst 4500 series switch.

Examples The following 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


                                                 Testing Interval
  ID   Test Name                               Attributes  (day hh:mm:ss.ms)
  ==== ======================================= =========== =================
    1) supervisor-bootup ---------------------> **D****I**   not configured
    2) packet-memory-bootup ------------------> **D****I**   not configured
    3) packet-memory-ongoing -----------------> **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


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


Switch#
```

Related Commands	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.

Command Default 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	This command was introduced on the Catalyst 4500 series switch.

Examples The following 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 --------------------> .
```

The following 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
```

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


_____

Switch#
```

show diagnostic result module test

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

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

Syntax Description

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

Command Default   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   The following example shows how to display the results of the bootup packet memory tests:

```
Switch# show diagnostic result module 6 detail

module 6:

  Overall diagnostic result:PASS

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

  _____

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

          Error code --------------------------> 0 (DIAG_SUCCESS)
          Total run count ---------------------> 1
          Last test execution time ------------> Jan 21 2001 19:48:30
          First test failure time -------------> n/a
          Last test failure time --------------> n/a
          Last test pass time -----------------> Jan 21 2001 19:48:30
          Total failure count -----------------> 0
          Consecutive failure count -----------> 0
```

```
Slot Ports Card Type                            Diag Status     Diag Details
---- ----- ------------------------------------ --------------- ------------
 6    48   10/100/1000BaseT (RJ45)V, Cisco/IEEE  Passed          None

Detailed Status
---------------
. = Pass             U = Unknown
L = Loopback failure S = Stub failure
I = Ilc failure      P = Port failure
E = SEEPROM failure  G = GBIC integrity check failure


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

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

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


   _____


   2) online-diag-tdr:

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

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


         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#
```

Related Commands

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.

Command Default   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   The following 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 ------------> .
```

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

```
Switch# show diagnostic result module 2 test 2 detail

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


_____

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

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

```
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.
```

Related Commands

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.

Command Default   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   The following example shows how to display the results from the ongoing packet memory tests:

```
Switch# show diagnostic result module 1 test 3

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

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

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

```
Switch# show diagnostic result module 1 test 3 detail

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


_____

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

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

```
Packet memory errors: 0 0
Current alert level: green
Per 5 seconds in the last minute:
    0 0 0 0 0 0 0 0 0 0
    0 0
Per minute in the last hour:
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    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
    0 0 0 0 0 0 0 0 0 0
Direct memory test failures per minute in the last hour:
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0
    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
Related Commands	**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 nondefault 802.1X configuration.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(12c)EW	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.
12.2(32)SG	The output of the **show dot1x interface** command was modified; It no longer displays port status.

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.

To display port authorization state information, enter the **show authentication sessions interface** *type number* command and the **show authentication** interface command for interface summary information.

Examples   The following 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#
```

Related Commands

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.
dot1x max-reauth-req	Sets the maximum number of times that the switch will retransmit an EAP-Request/Identity frame to the client before 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 eigrp plugins

To display general information including the versions of the Enhanced Interior Gateway Routing Protocol (EIGRP) protocol features that are currently running, use the **show eigrp plugins** command in user EXEC or privileged EXEC mode.

show eigrp plugins [*plugin-name*] [**detailed**]

Syntax Description

plugin-name	(Optional) Name of an EIGRP plugin to display.
detailed	(Optional) Displays detailed information about EIGRP features.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
15.2(5)E2	Support for EVN/vNets is introduced.

Usage Guidelines

Use the **show eigrp plugins** command in user EXEC or privileged EXEC mode to determine if a particular EIGRP feature is available in your Cisco IOS image. This command displays a summary of information about EIGRP service families and address families.

This command is useful when contacting Cisco technical support.

Examples

The following example shows how to display EIGRP plugin information:

```
Sup7e#show eigrp plugins
EIGRP feature plugins:::
    eigrp-release     :  20.00.00 : Portable EIGRP Release
                      :   1.01.18 : Source Component Release(rel20)
    parser            :   2.02.00 : EIGRP Parser Support
    igrp2             :   2.00.00 : Reliable Transport/Dual Database
    eigrp-nsf         :   2.01.00 : Platform Support
    Spatial Reuse Prot :  1.01.00 : Platform Support
    bfd               :   2.00.00 : BFD Platform Support
    EVN/vNets         :   1.00.00 : Easy Virtual Network (EVN/vNets)
    ipv4-af           :   2.01.01 : Routing Protocol Support
    ipv4-sf           :   1.02.00 : Service Distribution Support
    ipv6-af           :   2.01.01 : Routing Protocol Support
    ipv6-sf           :   2.01.00 : Service Distribution Support
    vNets-parse       :   1.00.00 : EIGRP vNets Parse Support
    snmp-agent        :   2.00.00 : SNMP/SNMPv2 Agent Support
```

Table 24 describes the significant fields shown in the display.

Table 24   show eigrp plugins Field Descriptions

Field	Description
eigrp release	Displays the portable EIGRP release version.
igrp2	Displays the reliable transport and dual database version.
bfd	Displays the EIGRP-BFD feature version.
EVN/vNets	Displays the EVN/vNets version.
ipv4-af	Displays the EIGRP IPv4 routing protocol feature version.
ipv4-sf	Displays the EIGRP IPv4 service distribution feature version.
ipv6-af	Displays the EIGRP IPv6 routing protocol feature version.
ipv6-sf	Displays the EIGRP IPv6 service distribution feature version.
snmp-agent	Displays the EIGRP SNMP and SNMPv2 Agent Support version.

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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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 **show environment** command was added.

Examples

The following 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
Supply  Model No        Type    Status        Sensor
------  ---------------  ---------  -----------  ------
PS1     PWR-C45-1400AC  AC 1400W  good          good
PS2     none            --        --            --

Power Supply    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
Fantray removal timeout: 240

Power consumed by Fantray : 50 Watts
```

The following example shows how to display information about the environment alarms:

```
Switch# show environment alarm
no alarm
Switch#
```

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

```
Switch# show environment status
Power                                          Fan
Supply  Model No         Type       Status     Sensor
------  ---------------  ---------  ----------- ------
PS1     PWR-C45-1400AC   AC 1400W   good        good
PS2     none             --         --          --

Power Supply    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

Switch#
```

The following example shows how to display information about the chassis:

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

The following example shows how to display information about the fan tray:

```
Switch# show environment status fantray
Fantray : good
Power consumed by Fantray : 50 Watts
Switch#
```

The following example shows how to display information about the power supply:

```
Switch# show environment status powersupply
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#
```

The following example shows how to display information about the supervisor engine:

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

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

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

show errdisable detect

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

show errdisable detect

Syntax Description   This command has no arguments or keywords.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

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

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

You can configure error-disabled detection in these modes:

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

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

```
Switch> show errdisable detect
ErrDisable Reason    Detection    Mode
-----------------    ---------    ----
arp-inspection       Enabled      port
bpduguard            Enabled      vlan
channel-misconfig    Enabled      port
community-limit      Enabled      port
dhcp-rate-limit      Enabled      port
dtp-flap             Enabled      port
gbic-invalid         Enabled      port
inline-power         Enabled      port
invalid-policy       Enabled      port
l2ptguard            Enabled      port
link-flap            Enabled      port
loopback             Enabled      port
lsgroup              Enabled      port
pagp-flap            Enabled      port
```

```
psecure-violation    Enabled    port/vlan
security-violatio    Enabled    port
sfp-config-mismat    Enabled    port
storm-control        Enabled    port
udld                 Enabled    port
vmps                 Enabled    port
```

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

show errdisable recovery

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

> **show errdisable recovery**

Syntax Description   This command has no arguments or keywords.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

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

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

```
Switch> show errdisable recovery
ErrDisable Reason    Timer Status
-----------------    --------------
udld                 Disabled
bpduguard            Disabled
security-violatio    Disabled
channel-misconfig    Disabled
vmps                 Disabled
pagp-flap            Disabled
dtp-flap             Disabled
link-flap            Enabled
l2ptguard            Disabled
psecure-violation    Disabled
gbic-invalid         Disabled
dhcp-rate-limit      Disabled
unicast-flood        Disabled
storm-control        Disabled
arp-inspection       Disabled
loopback             Disabled
Timer interval:300 seconds

Interfaces that will be enabled at the next timeout:

Interface    Errdisable reason    Time left(sec)
---------    ----------------     --------------
Gi1/0/2      link-flap                 279
```

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

Related Commands

Command	Description
errdisable recovery	Configures the recover mechanism variables.
show errdisable detect	Displays error-disabled detection status.
show interfaces status	Displays 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 etherchannel** [*channel-group*] {**port-channel** | **brief** | **detail** | **summary** | **port** | **load-balance** | **protocol**}

Syntax Description

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

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following example shows how to display port-channel information for a specific group:

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

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

The following example shows how to display load-balancing information:

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

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

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

The following 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
------------

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

Flags:  S - Device is sending Slow hello.  C - Device is in Consistent state.
        A - Device is in Auto mode.         P - Device learns on physical port.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.

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

Age of the port in the current state: 02h:33m:14s
Port: Fa5/5
------------

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

Flags:  S - Device is sending Slow hello.  C - Device is in Consistent state.
        A - Device is in Auto mode.         P - Device learns on physical port.
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         1s       0        128      Any    0
```

```
                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
GC                  = 0x00000000     HotStandBy port = null
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#
```

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

```
Switch# show etherchannel summary
Flags:  D - down         P - bundled in  port-channel
        I -  stand-alone s - suspended
        H - Hot-standby (LACP only)
        R  - Layer3      S -  Layer2
        U - in use       f - failed to allocate  aggregator

        M - not in  use, minimum links not  met
        u - unsuitable for  bundling
        w - waiting to be  aggregated
        d - default  port

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

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

The following 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 = Po1
Port indx    = 0          Load = 0x00

Flags:  S - Device is sending Slow hello.  C - Device is in Consistent state.
        A - Device is in Auto mode.        P - Device learns on physical port.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.

Local information:
                                  Hello    Partner  PAgP    Learning  Group
```

```
Port       Flags State   Timers  Interval Count   Priority  Method  Ifindex
Fa5/4      d     U1/S1            1s       0       128       Any     0

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

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

Flags:  S - Device is sending Slow hello.  C - Device is in Consistent state.
        A - Device is in Auto mode.        P - Device learns on physical port.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.

<...output truncated...>

Switch#
```

The following 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#
```

Related Commands	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 fabric domain

To display your fabric domain configuration, use the **show fabric domain** command.

show fabric domain

Command Default   Default domain and default context.

Command Modes   Privileged EXEC

Command History

Release	Modification
3.9.01E	This command was introduced on the Catalyst 4500-E series switch using a Supervisor Engines 8-E and 8L-E.

Usage Guidelines   Use the command to display a summary of the fabric domain.

Examples   This is sample output for the show fabric domain command, for an edge device.

```
device#show fabric domain
Fabric Domain : "default"
Role : Edge
Control-Plane Service: Disabled
Number of "Control-Plane" node(s): 2
IP Address           Auth-key
--------------------------------
192.168.1.4          example-key1
192.168.1.5          example-key2

Number of "Border" node(s): 1
 IP Address
 --------------
 192.168.1.6

Number of context(s): 2
 Codes: * - Not Configured

 Name              ID       Host-pools
 ---------------------------------------------
default            0        *
example-context    10       1
```

show fabric context

To display your fabric domain configuration, use the **show fabric domain** command.

show fabric context [default | *name***]**

Syntax Description

default	The default context
name	Specifies a context in the fabric domain

Command Default   Default context

Command Modes   Privileged EXEC

Command History

Release	Modification
3.9.01E	This command was introduced on the Catalyst 4500-E series switch using a Supervisor Engines 8-E and 8L-E.

Usage Guidelines   Use the command to display a summary of the context configuration in your fabric domain.

Examples   This is sample output for the **show fabric context** command:

```
device#show fabric context
Fabric-domain: default
Number of context(s): 2
 Name               ID        Host-pools
---------------------------------------------
default             0         *
example-context     10        1

* - Not Configured
```

show fabric host-pool

To display your fabric domain configuration, use the **show fabric domain** command.

show fabric host-pool *name*

Syntax Description	*name* The name of the host-pool

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
3.9.01E	This command was introduced on the Catalyst 4500-E series switch using a Supervisor Engines 8-E and 8L-E.

Usage Guidelines Use the command to display a summary of the specified host-pool configuration.

Examples This is sample output for the **show fabric host-pool** command:

```
device# show fabric host-pool
Fabric Domain : "default"
 context: default
   Number of host-pools : 0
   name          vlan   prefix              gateway          use-dhcp
 --------------------------------------------------------------------------------

 context: example-context
   Number of host-pools : 1
   name          vlan   prefix              gateway          use-dhcp
 --------------------------------------------------------------------------------
   VOICE_DOMAIN   10     192.168.1.0/24      192.168.1.254    209.65.201.6
```

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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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 2-25 describes the fields in the **show flowcontrol** command output.

Table 2-25 show flowcontrol Command Output

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

Examples   The following example shows how to display the flow control status on all the Gigabit Ethernet interfaces:

```
Switch# show flowcontrol
Port      Send FlowControl  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#
```

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

```
Switch# show flowcontrol module 1
Port   Send FlowControl  Receive FlowControl  RxPause TxPause
       admin    oper      admin    oper
-----  -------- --------  -------- --------    ------- -------
Gi1/1  desired  off       off      off         0       0
Gi1/2  on       disagree  on       on          0       0
Switch#
```

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

```
Switch# show flowcontrol interface gigabitethernet3/4
Port   Send FlowControl  Receive FlowControl  RxPause TxPause
       admin    oper      admin    oper
-----  -------- --------  -------- --------    ------- -------
Gi3/4  off      off       on       on          0       0
Switch#
```

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

```
Switch# show flowcontrol interface tengigabitethernet1/1
Port      Send FlowControl  Receive FlowControl  RxPause TxPause
          admin    oper     admin    oper
--------- -------- -------- -------- --------     ------- -------
Te1/1     off      off      on       off          0       0
Switch#
```

Related Commands

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.

Command Default X2 mode.

Command Modes Global configuration mode

Command History

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

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

On Supervisor Engine 6-E, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F, 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 The following 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#
```

Related Commands

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

show hw-module system max-port-num-mode

To display the current mode in which a system is running as well as a message informing you that linecards beyond the 5th slot are unsupported, use the **show hw-module system max-port-num-mode** command.

show hw-module system max-port-num-mode

Command Default none

Command Modes Privileged EXEC mode

Command History

Release	Modification
Release IOS XE 3.5.0E and IOS 15.2(1)E	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines The CLI shall be visible only on a 10-slot chassis or if 10-slot chassis is present in VSS.

Examples The following example shows the output of the **show** **hw-module system max-port-num-mode** command on the standalone switch:

```
Switch# show hw-module system max-port-num-mode
Active max-port-num-mode configuration is 2
In this mode, Line cards inserted in last 3 slots (8,9 and 10) will not be active
```

The following example shows the output of the **show hw-module system max-port-num-mode** command in switch virtual mode:

```
Switch1# show hw-module system max-port-num-mode
Executing the command on VSS member switch role = VSS Active, id = 1
Active max-port-num-mode configuration is 1 (Default)
Executing the command on VSS member switch role = VSS Standby, id = 2
Active max-port-num-mode configuration is 2
In this mode, Line cards inserted in last 3 slots (8,9 and 10) will not be active
```

show hw-module uplink

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

show hw-module uplink

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.2(25)EW	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   The following example shows the output displaying the current (active) uplinks:

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

The following 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
```

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

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

Related Commands

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.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
12.1(12c)EW	Support for the **power-supply**, **fan-tray**, **clock-module**, and **mux-buffer** keywords was added.
12.1(13)EW	Support for **interface** keyword was added.
12.2(18)EW	Enhanced the **show idprom interface** 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   The following 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#
```

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

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

```
         CC_BASE          = 0x1A

Extended ID Fields
 Options          = Loss of Signal implemented TX_FAULT signal implemented TX_DISABLE is
implemented and disables the serial output  [0x1A]
 BR, max          = Unspecified
 BR, min          = Unspecified
 Vendor Serial No. = K1273DH
 Date code         = 030409
 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/
20944D40  1A 80 ED 00 00 00 00 00 00 00 00 00 38 23 3C 1B   ............8#<.


        SEEPROM contents (hex) size 128:
0x0000  01 00 01 00 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
0x0030  2D 43 53 43 20 20 20 20 42 20 20 20 00 00 00 1A   -CSC    B   ....
0x0040  00 1A 00 00 4B 31 32 37 33 44 48 20 20 20 20 20   ....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 00 38 23 3C 1B   .^@m.........8#<.
Switch#
```

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

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

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

```
Fibre Type Byte 0                      :0x40 =NDSF only
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 :
 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 0x20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 0x30: 00 00 00 00 11 E2 69 A9 2F 95 C6 EE D2 DA B3 FD
 0x40: 9A 34 4A 24 CB 00 00 00 00 00 00 00 00 EF FC
 0x50: F4 AC 1A D7 11 08 01 36 00
Switch#
```

The following 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#
```

The following 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#
```

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

```
Switch# show idprom power-supply 1
Power Supply 0 Idprom:
 Common Block Signature = 0xABAB
 Common Block Version = 1
 Common Block Length = 144
 Common Block Checksum = 10207
 Idprom Size = 256
 Block Count = 1
 FRU Major Type = 0xAB01
 FRU Minor Type = 8224
 OEM String = Cisco Systems, Inc.
 Product Number = WS-CAC-1440W
 Serial Number = ACP05180002
 Part Number = 34-XXXX-01
 Part Revision = A0
 Manufacturing Deviation String =
 Hardware Revision = 1.1
 Manufacturing Bits = 0x0000
 Engineering Bits = 0x3031
 Snmp OID = 9.12.3.65535.65535.65535.65535.65535
 Power Consumption = -1
 RMA Failure Code = 255 255 255 255
 Power Supply Block Signature = 0xFFFF
 PowerSupply Block Version = 255
 PowerSupply Block Length = 255
 PowerSupply Block Checksum = 65535
 Feature Bits = 0x00000000FFFFFFFF
 Current @ 110V = -1
 Current @ 220V = -1
```

```
 StackMIB OID = 65535
Switch#
```

The following example shows how to display IDPROM information for the fan tray:

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

show interfaces

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

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

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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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.
12.2(52)SG	Added support for per-VLAN error-disable detection.

Usage Guidelines

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

In some cases, the duplex mode that is displayed by the **show interfaces** command is different than that displayed by the **show running-config** command. The duplex mode that is displayed in the **show interfaces** command is the actual duplex mode that the interface is running. The **show interfaces** command shows the operating mode for an interface, but the **show running-config** command shows the configured mode for an interface.

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

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

Examples   The following example shows how to display traffic for Gigabit Ethernet interface 2/5:

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

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

```
Switch# show interfaces tengigabitethernet1/1
Name: Tengigabitethernet1/1
Switchport: Enabled
Administrative Mode: private-vlan promiscuous trunk
Operational Mode: private-vlan promiscuous (suspended member of bundle Po1)
Administrative Trunking Encapsulation: negotiate
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: none
Trunking Native Mode VLAN: none
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: 202 (VLAN0202) 303 (VLAN0303) 304 (VLAN0304)
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk
Native VLAN tagging: enabled
Administrative private-vlan trunk encapsulation: 802.1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Administrative private-vlan 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#
```

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

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

```
FastEthernet6/3 is up, line protocol is up (connected)
  Hardware is Fast Ethernet Port, address is 0003.6ba8.ee68 (bia 0003.6ba8.ee68)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s, link type is auto, media type is 10/100BaseTX
  input flow-control is unsupported output flow-control is unsupported
Auto-MDIX on (operational: on)
ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  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
     0 output errors, 0 collisions, 0 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#
```

The following 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#
```

The following 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 (virtual switch)

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

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

Syntax Description

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

Command Default

This command has no defaults settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE 3.4.0SG and 15.1(2)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines

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

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

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

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

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

```
Router# show interfaces GigabitEthernet switch 1/3/3
GigabitEthernet1/3/3 is up, line protocol is up (connected)
  Hardware is C6k 1000Mb 802.3, address is 000f.2305.49c0 (bia 000f.2305.49c0)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
      reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID  1., loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, media type is LH
  input flow-control is off, output flow-control is on
  Clock mode is auto
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:19, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
  L2 Switched: ucast: 360 pkt, 23040 bytes - mcast: 0 pkt, 0 bytes
  L3 in Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes mcast
  L3 out Switched: ucast: 0 pkt, 0 bytes mcast: 0 pkt, 0 bytes
     437 packets input, 48503 bytes, 0 no buffer
     Received 76 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     86 packets output, 25910 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 PAUSE output
     0 output buffer failures, 0 output buffers swapped out
Router#
```

Related Commands

Command	Description
interface (virtual switch)	Selects an interface to configure and enters the interface configuration mode.

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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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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

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

```
Switch# show interfaces counters errors module 1

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

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

The following 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#
```

The following 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#
```

The following 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         BcastSuppLevel   TotalSuppressionDiscards
Fa5/35              10.00%                    6278550
Switch#
```

Related Commands	Command	Description
	show interfaces (virtual switch)	Displays the interface capabilities for an interface or for all the interfaces on a switch.

show interfaces counters (virtual switch)

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

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

Syntax Description

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

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(52)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines

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

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

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

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

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

- If interface specifies a physical port, the command displays the message "Etherchannel not enabled on this interface."

- If interface is omitted, the command displays the counters for all port channels (in the system) and for their associated physical ports.

• If interface specifies a port channel, the command displays the counters for the port channel and all of the physical ports that are associated with it. In addition, when you enter the command specifying the primary aggregator in a Link Aggregation Control Protocol (LACP) port channel with multiple aggregators, the output includes the statistics for all of the aggregators in the port channels and for the ports that are associated with them.

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

```
Router# show interfaces gigabitethernet 2/4/47 counters errors
Port            Align-Err    FCS-Err   Xmit-Err    Rcv-Err UnderSize OutDiscards
Gi2/4/47              0          0          0          0         0          0
Port            Single-Col Multi-Col  Late-Col Excess-Col Carri-Sen     Runts    s
Gi2/4/47              0          0          0          0         0          0    0
Port            SQETest-Err Deferred-Tx IntMacTx-Err IntMacRx-Err Symbol-Err
Gi2/4/47              0          0          0          0         0
Router#
```

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

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

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

```
Router# show interfaces counters etherchannel
Port               InOctets    InUcastPkts    InMcastPkts    InBcastPkts
Po1                       0          0          0          0
Po3                       0          0          0          0
Po10            16341138343   77612803   12212915   14110863
Gi1/4/1         15628478622   77612818    7525970   14110865
Gi1/4/2           712662881          0    4686951          5
Po20            33887345029   88483183   11506653   14101212
Gi2/4/1         33326378013   88491521    7177393   14101663
Gi2/4/2           562904837          0    4330030          6
Port              OutOctets   OutUcastPkts   OutMcastPkts   OutBcastPkts
Po1                       0          0          0          0
Po3                       0          0          0          0
Po10            33889238079   14101204   99999327          0
Gi1/4/1         33326354634   14101205   95669326          0
Gi1/4/2           562904707          7    4330029          0
Po20            16338422056   14353951   89573339          0
Gi2/4/1         15628501864   14232410   85017290          0
Gi2/4/2           712663011     121541    4565416          0
Router#
```

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

```
Router# show interfaces counters etherchannel
Port               InOctets    InUcastPkts    InMcastPkts    InBcastPkts
Po1                       0          0          0          0
Po3                       0          0          0          0
Po10            16341138343   77612803   12212915   14110863
Gi1/4/1         15628478622   77612818    7525970   14110865
Gi1/4/2           712662881          0    4686951          5
Po20            33887345029   88483183   11506653   14101212
Gi2/4/1         33326378013   88491521    7177393   14101663
```

```
Gi2/4/2              562904837            0        4330030              6
Router#
```

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

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

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

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

Related Commands

Command	Description
clear counters	Clears the interface counters.

show interfaces description

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

show interfaces [*interface*] **description**

Syntax Description

interface	(Optional) Type of interface.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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#
```

Related Commands

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

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.2(18)EW	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   The following 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
```

The following example shows how to display inactive link-level information:

```
Switch# show interfaces link

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

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

show interfaces mtu

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

show interfaces mtu [**module** *mod*]

Syntax Description	

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

Command Default   This command has no default settings.

Command Modes   EXEC

Command History

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

Examples   The following example shows how to display the MTU size for all interfaces on module 1:

```
Switch> show interfaces mtu module 1

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

Related Commands

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**]

Syntax Description

active	(Optional) Displays active interfaces only.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

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

Usage Guidelines

This command displays SVI information only.

Examples

The following example shows how to display PVLAN mapping information:

```
Switch# show interfaces private-vlan mapping
Interface Secondary VLAN Type
--------- -------------- -----------------
vlan2    301            isolated
vlan2    302            isolated
Switch#
```

Related Commands

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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

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

Usage Guidelines

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

Examples

The following example shows how to display the status of all interfaces:

```
Switch# show interfaces status

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

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

```
Switch# show interfaces status err-disabled

Port    Name            Status      Reason          Err-Disabled VLANs
----    ----            ------      -------          ------------------
Fa9/4                   notconnect  link-flap
Fa9/5                   err-disabled psecure_violation 3-5
Fa9/6                   connected   psecure_violation 10,15
Switch#
```

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

```
Switch# show interfaces status module 1
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
Gi1/11 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#
```

Related Commands	Command	Description
	errdisable detect cause	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.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History	Release	Modification
	12.1(8a)EW	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.
	15.1.0 SG	Support for PVLAN modes over EtherChannel. Modes include: private-vlan host, private-vlan promiscuous, private-vlan trunk secondary, and private-vlan trunk promiscuous.

Examples The following 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#
```

The following 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#
```

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

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

Unknown unicast blocked: disabled
Unknown multicast blocked: disabled
Appliance trust: none
Switch#
```

Related Commands	Command	Description
	show interfaces (virtual switch)	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*] **transceiver** {[**detail**]} | {**transceiver** [**module** *mod*] | **detail** [**module** *mod*]}}

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

Command Default

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	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.

Examples   The following 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#
```

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

The following 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.

                                    High Alarm  High Warn  Low Warn   Low Alarm
              Temperature           Threshold   Threshold  Threshold  Threshold
    Port      (Celsius)             (Celsius)   (Celsius)  (Celsius)  (Celsius)
    -------   ------------------    ----------  ---------  ---------  ---------
    Gi1/1     48.1                  100.0       100.0        0.0        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  High Warn  Low Warn   Low Alarm
              Voltage               Threshold   Threshold  Threshold  Threshold
    Port      (Volts)               (Volts)     (Volts)    (Volts)    (Volts)
    -------   ---------------       ----------  ---------  ---------  ---------
    Gi1/1     3.30                   6.50        6.50       N/A        N/A
    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)       (mA)       (mA)
    -------   ------------------    ----------  ---------  ---------  ---------
    Gi1/1     0.0                   130.0       130.0      N/A        N/A
    Gi1/2     1.7                   130.0       130.0      N/A        N/A
    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              High Alarm  High Warn  Low Warn   Low Alarm
        Transmit Power       Threshold   Threshold  Threshold  Threshold
  Port  (dBm)                (dBm)       (dBm)      (dBm)      (dBm)
  ------ ------------------  ----------  ---------  ---------  ---------
  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              High Alarm  High Warn  Low Warn   Low Alarm
        Receive Power        Threshold   Threshold  Threshold  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#
```

The following 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#
```

The following 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.

                             High Alarm  High Warn  Low Warn   Low Alarm
          Temperature        Threshold   Threshold  Threshold  Threshold
   Port   (Celsius)          (Celsius)   (Celsius)  (Celsius)  (Celsius)
   ------ ------------------  ----------  ---------  ---------  ---------
   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  High Warn  Low Warn   Low Alarm
          Voltage            Threshold   Threshold  Threshold  Threshold
   Port   (Volts)            (Volts)     (Volts)    (Volts)    (Volts)
   ------ ----------------    ----------  ---------  ---------  ---------
   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)       (mA)       (mA)
      -------  ----------------  ----------  ---------  ---------  ---------
      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         High Alarm  High Warn  Low Warn   Low Alarm
              Transmit Power  Threshold   Threshold  Threshold  Threshold
      Port    (dBm)           (dBm)       (dBm)      (dBm)      (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)       (dBm)      (dBm)      (dBm)
      -------  ----------------  ----------  ---------  ---------  ---------
      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#
```

The following 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, 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
Switch#
```

The following 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.

                              High Alarm  High Warn  Low Warn   Low Alarm
            Temperature       Threshold   Threshold  Threshold  Threshold
      Port  (Celsius)         (Celsius)   (Celsius)  (Celsius)  (Celsius)
      ------- -----------------  ----------  ---------  ---------  ---------
      Gi2/1   43.5              70.0        60.0       5.0        0.0

                              High Alarm  High Warn  Low Warn   Low Alarm
            Voltage           Threshold   Threshold  Threshold  Threshold
      Port  (Volts)           (Volts)     (Volts)    (Volts)    (Volts)
      ------- ---------------  ----------  ---------  ---------  ---------
      Gi2/1   5.03              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)       (mA)       (mA)
         -------  -------------- ----------  ---------  ---------  ---------
         Gi2/1    50.6        +     60.0        40.0       10.0       5.0

                  Optical        High Alarm  High Warn  Low Warn   Low Alarm
                  Transmit Power Threshold   Threshold  Threshold  Threshold
         Port     (dBm)          (dBm)       (dBm)      (dBm)      (dBm)
         -------  -------------- ----------  ---------  ---------  ---------
         Gi2/1    -16.7 (-13.0) --  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)       (dBm)      (dBm)      (dBm)
         -------  -------------- ----------  ---------  ---------  ---------
         Gi2/1    N/A  (-28.5)      5.9        -6.7      -28.5      -28.5
Switch#
```

Related Commands

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*]

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

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following 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 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

Port      Vlans allowed and active in management domain
Fa5/1     none
Fa5/2     none
Fa5/3     none
Fa5/4     none
Fa5/5     none
Fa5/6     none
Fa5/7     none
Fa5/8     200
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
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     200
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
02,850,917,999,1002-1005
Fa5/10    none
Fa5/11    none

Fa5/48    none
Switch#
```

The following example shows how to display trunking information for active trunking ports:

```
Switch# show interfaces trunk

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

Port      Vlans allowed on trunk
Fa5/9     1-1005

Port      Vlans allowed and active in management domain
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
02,850,917,999,1002-1005

Port      Vlans in spanning tree forwarding state and not pruned
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
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 **statistics** keyword, displays the statistics for the selected range of VLANs. Without the **statistics** keyword, displays the configuration and operating state of DAI for the selected range of VLANs.
interfaces *interface-name*		(Optional) Displays the trust state and the rate limit of ARP packets for the provided interface. When the interface name is not specified, the command displays the trust state and rate limit for all applicable interfaces in the system.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

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

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

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

Vlan      Forwarded         Dropped      DHCP Drops     ACL Drops
----      ---------         -------      ----------     ----------
   3          31753          102407          102407             0

Vlan   DHCP Permits     ACL Permits    Source MAC Failures
----   ------------     -----------    -------------------
   3          31753               0                      0

Vlan   Dest MAC Failures   IP Validation Failures
----   -----------------   ----------------------
   3                   0                        0
Switch#
```

The following 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 Failures
 ----   ------------    -----------    -------------------
    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   IP Validation 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#
```

The following 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#
```

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

```
Switch# show ip arp inspection interfaces fastEthernet 6/1
Interface         Trust State    Rate (pps)    Burst Interval
--------------    -----------    ----------    --------------
 Fa6/1            Untrusted              20                 5
Switch#
```

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

```
Switch# show ip arp inspection interfaces
Interface        Trust State      Rate (pps)
---------------  -----------      ----------
 Gi1/1           Untrusted                15
 Gi1/2           Untrusted                15
 Gi3/1           Untrusted                15
 Gi3/2           Untrusted                15
 Fa3/3           Trusted                None
 Fa3/4           Untrusted                15
 Fa3/5           Untrusted                15
 Fa3/6           Untrusted                15
 Fa3/7           Untrusted                15
Switch#
```

Related Commands	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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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    10.1.1.2        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.3        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.4        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.5        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.6        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.7        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.8        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.9        1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.10       1(12:02:52 UTC Fri Apr 25 2003)
Fa6/3           1      0002.0002.0002    10.1.1.11       1(12:02:52 UTC Fri Apr 25 2003)
   --           --         --               --          5(12:02:52 UTC Fri Apr 25 2003)
Switch#
```

The following 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#
```

Related Commands	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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following example shows how to display the prefixes for a specific VLAN:

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

The following 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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following example shows how to display the DHCP snooping configuration:

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

show ip dhcp snooping binding

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.

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.

Command Default 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	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 The following 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#
```

The following 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  172.100.101.102 1600                dhcp-snooping   100     FastEthernet3/1
Switch#
```

The following 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#
```

The following example shows how to display the DHCP snooping binding entries' MAC address for a specific VLAN:

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

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

The following 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#
```

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

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

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

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

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

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

Table 2-26 describes the fields in the **show ip dhcp snooping** command output.

Table 2-26   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.
Type	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.

Related Commands

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(12c)EW	This command was introduced on the Catalyst 4500 series switch.
12.1(19)EW	Added support of state and statistics information.

Examples   The following 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#
```

The following 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 :       21
Successful Reads     :        0   Failed Reads     :        0
Successful Writes    :        0   Failed Writes    :       21
Media Failures       :        0

First successful access: Read

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

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

Switch#
```

Related Commands

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 **0**.
vlan *vlan_id*	(Optional) Specifies the VLAN and the number of the VLAN; valid values are from 1 to 4094.

Command Default

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	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

The following example shows how to view IGMP information for VLAN 200:

```
Switch# show ip igmp interface vlan 200
IGMP snooping is globally enabled
IGMP snooping is enabled on this Vlan
IGMP snooping immediate-leave is disabled on this Vlan
IGMP snooping mrouter learn mode is pim-dvmrp on this Vlan
IGMP snooping is running in IGMP-ONLY mode on this VLAN
Switch#
```

Related Commands	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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

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

Examples   The following 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#
```

The following example shows how to display all IGMP profiles:

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

Related Commands

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.

Command Default This command has no default settings.

Command Modes EXEC

Command History

Release	Modification
12.1(8a)EW	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   The following example shows how to display the global snooping information on the switch:

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

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

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

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

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

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

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

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

The following 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>
```

The following 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>
```

The following 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      v3            Router
2         224.2.2.2       v3            Fa6/2
Switch>
```

The following 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>
```

The following 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>
```

The following 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>
```

The following 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>
```

The following 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>
```

The following 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#
```

The following 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>
```

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

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

Related Commands	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.

Command	Description
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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(20)EW	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   The following 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#
```

The following 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#
```

The following 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     0002.4ba0.a4f6  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#
```

Related Commands	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.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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 The following example shows how to display snooping information for a specific VLAN:

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

Related Commands

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 VLAN; valid values are from 1 to 1001 and from 1006 to 4094.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following example shows how to display snooping information for a specific VLAN:

```
Switch# show ip igmp snooping vlan 2
vlan 2
----------
IGMP snooping is globally enabled
IGMP snooping TCN solicit query is globally enabled
IGMP snooping global TCN flood query count is 2
IGMP snooping is enabled on this Vlan
IGMP snooping immediate-leave is disabled on this Vlan
IGMP snooping mrouter learn mode is pim-dvmrp on this Vlan
IGMP snooping is running in IGMP_ONLY mode on this Vlan
Switch#
```

Related Commands	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.

Command Default   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   The following 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 2-27 describes the fields that are shown in the example.

Table 2-27   ***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 2-27   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.	

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F, 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.

Examples   The following 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
   Vlan7 (A)
Switch#
```

Related Commands

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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#
```

Related Commands

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

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

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following 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#
```

The following 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#
```

The following 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#
```

The following 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 2-28 describes the fields shown in the output.

Table 2-28   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 2-28   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 2-28   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 **ip pim nbma-mode** 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.

Related Commands

Command	Description
ip multicast-routing (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.

Command Default   Displays both static and DHCP snooping bindings.

Command Modes   Privileged EXEC mode

Command History	Release	Modification
	12.1(19)EW	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines   The optional parameters filter the display output result.

Examples   The following 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#
```

The following 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
------------------ --------------- ----------  ------------  ----  --------------------
00:00:00:0A:00:0B  11.0.0.1        infinite    static        10    FastEthernet6/10
Switch#
```

Related Commands	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.

Command Default	This command has no default settings.

Command Modes	Privileged EXEC mode

Command History

Release	Modification
12.1(19)EW	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
```

✎

Note The second entry shows that a default PVACL (deny all IP traffic) is installed on the port for those snooping-enabled VLANs that do not have a valid IP source binding.

- This output appears when you enter the **show ip verify source interface fa6/2** command and DHCP snooping is enabled on VLANs 10–20, interface fa6/1 has IP source filter mode that is configured as IP, and there is an existing IP address binding 10.0.0.1 on VLAN 10:

```
Interface  Filter-type  Filter-mode  IP-address       Mac-address     Vlan
---------  -----------  -----------  ---------------  --------------  ---------
fa6/2      ip           inactive-trust-port
```

- 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
```

> ✎
>
> **Note** Enable port security first because the DHCP security MAC filter cannot apply to the port or VLAN.

- This output appears when you enter the **show ip verify source interface fa6/6** command and the interface fa6/6 does not have IP source filter mode that is configured:

```
DHCP security is not configured on the interface fa6/6.
```

The following example shows how to display all the interfaces on the switch that have DHCP snooping security and IP Port Security tracking enabled with the **show ip verify source** command.

The output is an accumulation of per-interface **show** CLIs:

```
Interface  Filter-type  Filter-mode         IP-address       Mac-address     Vlan
---------  -----------  -----------         ---------------  --------------  ---------
fa6/1      ip           active              10.0.0.1                         10
fa6/1      ip           active              deny-all                         11-20
fa6/2      ip           inactive-trust-port
Fa6/3      ip trk       active              40.1.1.24                        10
Fa6/3      ip trk       active              40.1.1.20                        10
Fa6/3      ip trk       active              40.1.1.21                        10
fa6/4      ip-mac       active              10.0.0.2         aaaa.bbbb.cccc  10
fa6/4      ip-mac       active              11.0.0.1         aaaa.bbbb.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
```

Related Commands	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 ip wccp

To display the Web Cache Communication Protocol (WCCP) global configuration and statistics, use the **show ip wccp** command in user EXEC or privileged EXEC mode.

> **show ip wccp** [*service-number* [**view** | **detail**] | **interfaces** [**cef** | **counts** | **detail**] | **web-cache**]

Syntax Description

service-number	(Optional) Identification number of the web cache service group being controlled by the cache. The number can be from 0 to 254. For web caches using Cisco cache engines, the reverse proxy service is indicated by a value of 99.
interfaces	(Optional) WCCP redirect interfaces.
cef	(Optional) CEF interface statistics, including the number of input, output, dynamic, static, and multicast services.
counts	(Optional) WCCP interface count statistics, including the number of CEF and process-switched output and input packets redirected.
detail	(Optional) WCCP interface configuration statistics, including the number of input, output, dynamic, static, and multicast services.
web-cache	(Optional) Statistics for the web cache service.
view	(Optional) Other members of a particular service group, have or have not been detected.
detail	(Optional) Information about the router and all web caches.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
15.0(2)SG	This command was introduced on Catalyst 4900M, Catalyst 4948E, Supervisor Engine 6-E, and Supervisor Engine 6L-E.

Usage Guidelines

Use the **clear ip wccp** command to reset the counter for the "Packets Redirected" information.

Use the **show ip wccp** *service-number* command to get the "Total Packets S/W Redirected" count. The "Total Packets S/W Redirected" count is the number of packets redirected in software.

Use the **show ip wccp** *service-number* **detail** command to get the "Packets Redirected" count. The "Packets Redirected" count is the number of packets redirected in software.

Use the **show ip wccp web-cache detail** command to get an indication of which traffic is redirected to which cache engine.

Use the **show ip wccp** command to show the configured WCCP services and a summary of their current state.

For cache-engine clusters using Cisco cache engines, the reverse proxy *service-number* is indicated by a value of 99.

All the packet statistics correspond to packets switched in software.

Examples   This section contains examples and field descriptions for the following forms of this command:

- **show ip wccp** *service-number*
- **show ip wccp** *service-number* **view**
- **show ip wccp** *service-number* **detail**
- **show ip wccp interfaces**
- **show ip wccp web-cache**
- **show ip wccp web-cache detail**
- **show ip wccp**

show ip wccp *service-number*

The following is sample output from the **show ip wccp** *service-number* command:

```
Switch# show ip wccp 90

Global WCCP information:
    Router information:
        Router Identifier:               100.1.1.16
        Protocol Version:                2.0

    Service Identifier: 90
        Number of Service Group Clients:     1
        Number of Service Group Routers:     1
        Total Packets s/w Redirected:        0
          Process:                           0
          CEF:                               0
        Redirect Access-list:               -none-
        Total Packets Denied Redirect:       0
        Total Packets Unassigned:            0
        Group Access-list:                  -none-
        Total Messages Denied to Group:      0
        Total Authentication failures:       0
        Total Bypassed Packets Received:     0
```

Table 29 describes the significant fields shown in the display.

Table 29   show ip wccp service-number Field Descriptions

Field	Description
Router information	A list of routers detected by the current router.
Protocol Version	The version of WCCP being used by the router in the service group.
Service Identifier	Indicates which service is detailed.
Number of Service Group Clients:	The number of clients that are visible to the router and other clients in the service group.
Number of Service Group Routers	The number of routers in the service group.
Total Packets s/w Redirected	Total number of packets s/w redirected by the router.
Redirect Access-list	The name or number of the access list that determines which packets will be redirected.
Total Packets Denied Redirect	Total number of packets that were not redirected because they did not match the access list.

Table 29   show ip wccp service-number Field Descriptions (continued)

Field	Description
Total Packets Unassigned	Number of packets that were not redirected because they were not assigned to any cache engine. Packets may not be assigned during initial discovery of cache engines or when a cache is dropped from a cluster.
Group Access-list	Indicates which cache engine is allowed to connect to the router.
Total Messages Denied to Group	Indicates the number of packets denied by the *group-list* access list.
Total Authentication failures	The number of instances where a password did not match.
Total Bypassed Packets Received	The number of packets that have been bypassed. Process, fast, and Cisco Express Forwarding (CEF) are switching paths within Cisco IOS software.

show ip wccp *service-number* **view**

The following is sample output from the **show ip wccp** *service-number* **view** command for service group 1:

```
Switch# show ip wccp 1 view

WCCP Router Informed of:
 10.168.88.10
 10.168.88.20

WCCP Cache Engines Visible
 10.168.88.11
 10.168.88.12

WCCP Cache Engines Not Visible:
 -none-
```

Note   The number of maximum service groups that can be configured is 256.

If any web cache is displayed under the WCCP Cache Engines Not Visible field, the router needs to be reconfigured to map the web cache that is not visible to it.

Table 30 describes the significant fields shown in the display.

Table 30   show ip wccp service-number view Field Descriptions

Field	Description
WCCP Router Informed of	A list of routers detected by the current router.
WCCP Clients Visible	A list of clients that are visible to the router and other clients in the service group.
WCCP Clients Not Visible	A list of clients in the service group that are not visible to the router and other clients in the service group.

show ip wccp *service-number* **detail**

The following example displays WCCP client information and WCCP router statistics that include the type of services:

```
Switch# show ip wccp 91 detail

WCCP Client information:
        WCCP Client ID:         10.10.10.2
        Protocol Version:       2.0
        State:                  Usable
        Redirection:            L2
        Packet Return:          GRE
        Packets Redirected:     0
        Connect Time:           00:05:23
        Assignment:             MASK

        Mask  SrcAddr    DstAddr    SrcPort DstPort
        ----  -------    -------    ------- -------
        0000: 0x00000000 0x00000001 0x0000  0x0000

        Value SrcAddr    DstAddr    SrcPort DstPort CE-IP
        ----- -------    -------    ------- ------- -----
        0000: 0x00000000 0x00000000 0x0000  0x0000  0x0A0A0A02 (10.10.10.2)
        0001: 0x00000000 0x00000001 0x0000  0x0000  0x0A0A0A02 (10.10.10.2)
```

show ip wccp interfaces

The following is sample output from the **show ip wccp interfaces** command:

```
Switch# show ip wccp interfaces

WCCP interface configuration:
    FastEthernet10/4
        Output services: 2
        Input services: 3
        Mcast services: 1
        Exclude In:      FALSE
```

Table 31 describes the significant fields shown in the display.

Table 31   show ip wccp interfaces Field Descriptions

Field	Description
Output services	Indicates the number of output services configured on the interface.
Input services	Indicates the number of input services configured on the interface.
Mcast services	Indicates the number of multicast services configured on the interface.
Exclude In	Displays whether traffic on the interface is excluded from redirection.

show ip wccp web-cache

The following is sample output from the **show ip wccp web-cache** command:

```
Switch# show ip wccp web-cache

Global WCCP information:
    Router information:
```

```
            Router Identifier:                  10.10.11.10
            Protocol Version:                   2.0

        Service Identifier: web-cache
            Number of Service Group Clients:    1
            Number of Service Group Routers:    1
            Total Packets Redirected:           0
              Process:                          0
              CEF:                              0
              Platform:                         0
            Redirect access-list:               no_linux
            Total Packets Denied Redirect:      0
            Total Packets Unassigned:           0
            Group access-list:                  -none-
            Total Messages Denied to Group:     0
            Total Authentication failures:      0
            Total Bypassed Packets Received: 0
```

Table 32 describes the significant fields shown in the display.

Table 32   show ip wccp web-cache Field Descriptions

Field	Description
Protocol Version	Indicates that WCCPv2 is enabled.
Service Identifier	Indicates which service is detailed.
Number of Service Group Clients	Number of clients using the router as their home router.
Number of Service Group Routers	The number of routers in the service group.
Total Packets s/w Redirected	Total number of packets s/w redirected by the router.
Redirect access-list	The name or number of the access list that determines which packets will be redirected.
Total Packets Denied Redirect	Total number of packets that were not redirected because they did not match the access list.
Total Packets Unassigned	Number of packets that were not redirected because they were not assigned to any cache engine. Packets may not be assigned during initial discovery of cache engines or when a cache is dropped from a cluster.
Group access-list	Indicates which cache engine is allowed to connect to the router.
Total Messages Denied to Group	Indicates the number of packets denied by the *group-list* access list.
Total Authentication failures	The number of instances where a password did not match.

show ip wccp web-cache detail

The following example displays web cache engine information and WCCP router statistics for the web cache service:

```
Switch# show ip wccp web-cache detail

WCCP Client information:
        WCCP Client ID:         10.10.10.2
        Protocol Version:       2.0
        State:                  Usable
        Redirection:            L2
        Packet Return:          GRE
```

```
        Packets Redirected:    0
        Connect Time:          00:23:19
        Assignment:            MASK

        Mask  SrcAddr    DstAddr    SrcPort DstPort
        ----  -------    -------    ------- -------
        0000: 0x00000000 0x00000001 0x0000  0x0000

        Value SrcAddr    DstAddr    SrcPort DstPort CE-IP
        ----- -------    -------    ------- ------- -----
        0000: 0x00000000 0x00000000 0x0000  0x0000  0x0A0A0A02 (10.10.10.2)
        0001: 0x00000000 0x00000001 0x0000  0x0000  0x0A0A0A02 (10.10.10.2)
```

Table 33 describes the significant fields shown in the display.

Table 33   show ip wccp web-cache detail Field Descriptions

Field	Description
WCCP Client Information	The header for the area that contains fields for information on clients.
WCCP Client ID	The IP address of the cache engine in the service group.
Protocol Version	The version of WCCP being used by the cache engine in the service group.
State	Indicates whether the cache engine is operating properly and can be contacted by a router and other cache engines in the service group.
Packets Redirected	The number of packets that have been redirected to the cache engine.
Connect Time	The amount of time the cache engine has been connected to the router.

show ip wccp

```
Switch# show ip wccp

Global WCCP information:
    Router information:
        Router Identifier:                10.10.11.10
        Protocol Version:                 2.0

    Service Identifier: web-cache
        Number of Service Group Clients:  1
        Number of Service Group Routers:  1
        Total Packets s/w Redirected:     0
          Process:                        0
          CEF:                            0
        Redirect access-list:             -none-
        Total Packets Denied Redirect:    0
        Total Packets Unassigned:         0
        Group access-list:                -none-
        Total Messages Denied to Group:   0
        Total Authentication failures:    0
        Total Bypassed Packets Received:  0

    Service Identifier: 91
        Number of Service Group Clients:  1
        Number of Service Group Routers:  1
```

```
        Total Packets s/w Redirected:       0
          Process:                          0
          CEF:                              0
        Redirect access-list:               -none-
        Total Packets Denied Redirect:      0
        Total Packets Unassigned:           0
        Group access-list:                  -none-
        Total Messages Denied to Group:     0
        Total Authentication failures:      0
        Total Bypassed Packets Received:    0
```

Related Commands

Command	Description
clear ip wccp	Clears the counter for packets redirected using WCCP.
ip wccp	Enables support of the WCCP service for participation in a service group.
ip wccp redirect	Enables packet redirection on an outbound or inbound interface using WCCP.

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following example shows how to display the participating nodes:

```
Switch# show ipc nodes
There are 3 nodes in this IPC realm.
   ID    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#
```

The following example shows how to display the local IPC ports:

```
Switch# show ipc ports
There are 11 ports defined.

Port ID         Type      Name                (current/peak/total)
   10000.1    unicast    IPC Master:Zone
   10000.2    unicast    IPC Master:Echo
   10000.3    unicast    IPC Master:Control
   10000.4    unicast    Remote TTY Server Port
   10000.5    unicast    GALIOS RF :Active
     index = 0  seat_id = 0x2020000  last sent = 0     heard = 1635   0/1/1635

   10000.6    unicast    GALIOS RED:Active
     index = 0  seat_id = 0x2020000  last sent = 0     heard = 2       0/1/2

 2020000.3    unicast    GALIOS IPC:Card 2:Control
 2020000.4    unicast    GALIOS RFS :Standby
 2020000.5    unicast    Slave: Remote TTY Client Port
 2020000.6    unicast    GALIOS RF :Standby
 2020000.7    unicast    GALIOS RED:Standby
```

```
RPC packets: current/peak/total
                                                            0/1/17
Switch#
```

The following 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#
```

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

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

This processor is the IPC master server.

6000 IPC message headers in cache
3363 messages in, 1680 out, 1660 delivered to local port,
1686 acknowledgements received, 1675 sent,
0 NACKS received, 0 sent,
0 messages dropped on input, 0 messages dropped on output
0 no local port, 0 destination unknown, 0 no transport
0 missing callback or queue, 0 duplicate ACKs, 0 retries,
0 message timeouts.
0 ipc_output failures, 0 mtu failures,
0 msg alloc failed, 0 emer msg alloc failed, 0 no origs for RPC replies
0 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 dhcp-ldra

To display configuration details and statistics for a Lightweight DHCPv6 Relay Agent (LDRA), use the **show ipv6 dhcp-ldra** command in user EXEC or privileged EXEC mode.

> **show ipv6 ldra** [**statistics**]

Syntax Description	statistics	(Optional) Displays LDRA-related statistics.

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS Release 15.2(5)E2	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines   Use this command to view the number and type of DHCPv6 packets received or processed, the number and type of DHCPv6 messages dropped, error counters, and the interface state (client-facing trusted interface, server-facing interface, and so on).

You can also view LDRA configuration details, such as the type of LDRA configuration and the interface or VLAN where the LDRA is configured.

Examples   The following sample output displays LDRA configuration details. The fields in the example below are self-explanatory.

```
Device # show ipv6 dhcp-ldra

DHCPv6 LDRA is Enabled.
DHCPv6 LDRA policy: client-facing-disable
      Target: none
DHCPv6 LDRA policy: client-facing-trusted
      Target: vlan 5
DHCPv6 LDRA policy: client-facing-untrusted
      Target: none
DHCPv6 LDRA policy: server-facing
      Target: Gi1/0/7
```

The following sample output displays LDRA configuration details after initiating a DHCP session. The fields in the example below are self-explanatory.

```
Device # show ipv6 dhcp-ldra statistics

                DHCPv6 LDRA client facing statistics.

Messages received              2
Messages sent                  2
Messages discarded             0
```

```
Messages                    Received
SOLICIT                     1
REQUEST                     1

Messages                    Sent
RELAY-FORWARD               2


            DHCPv6 LDRA server facing statistics.


Messages received           2
Messages sent               2
Messages discarded          0

Messages                    Received
RELAY-REPLY                 2

Messages                    Sent
ADVERTISE                   1
REPLY                       1
```

Related Commands	**Command**	**Description**
	ipv6 dhcp-ldra	Enables LDRA functionality on an access node.
	ipv6 dhcp ldra attach-policy (VLAN)	Enables LDRA functionality on a VLAN.
	ipv6 dhcp-ldra attach-policy	Enables LDRA functionality on an interface.

show ipv6 snooping counters

To display the number of packets dropped per port due to RA Guard, use the **show ipv6 snooping counters** *interface* command.

> **show ipv6 snooping counters** *interface*

Syntax Description	*interface*	Specifies the interface.

Command Default None

Command Modes Interface mode

Command History

Release	Modification
12.2(54)SG	The **show ipv6 first-hop counters** command was introduced on the Catalyst 4500 series switch.
15.0(2)SG, XE 3.3.0SG	Same behavior, new syntax; **show ipv6 snooping counters**

Examples This example provides a sample output for the **show ipv6 snooping counters** command on interface Gi2/49:

```
Switch# show ipv6 snooping counters int gi 2/48
Received messages on Gi2/48:
Protocol        Protocol message
ICMPv6          RS        RA        NS        NA        REDIR     CPS       CPA
                0         0         0         0         0         0         0

Bridged messages from Gi2/48:
Protocol        Protocol message
ICMPv6          RS        RA        NS        NA        REDIR     CPS       CPA
                0         0         0         0         0         0         0

Dropped messages on Gi2/48:
Feature/Message RS        RA        NS        NA        REDIR     CPS       CPA

Dropped reasons on Gi2/48:
Switch#
```

Note Only RA (Router Advertisement) and REDIR (Router Redirected packets) counters are supported in Cisco IOS Release 12.2(54)SG.

Related Commands

Command	Description
epm access control	Configures access control.

show ipv6 mld snooping

To display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping configuration of the switch or the VLAN, use the **show ipv6 mld snooping** command.

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

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

Command Modes   User EXEC mode

Command History	**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
Last listener query count    : 2
Last listener query interval  : 1000

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

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

```
Switch> show ipv6 mld snooping
Global MLD Snooping configuration:
-------------------------------------------
```

```
MLD snooping               : Enabled
MLDv2 snooping (minimal)   : Enabled
Listener message suppression : Enabled
TCN solicit query          : Disabled
TCN flood query count      : 2
Robustness variable        : 3
Last listener query count  : 2
Last listener query interval : 1000

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

<output truncated>

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

Related Commands	Command	Description
	ipv6 mld snooping	Enables 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) Specifies 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 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)
```

Related Commands

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	**vlan** *vlan-id*	(Optional) Specifiesa 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 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:

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

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

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

Related Commands	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.

Command Default This command has no default settings.

Command Modes User EXEC mode

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):

```
Switch# show issu capability entries 2082
Client_ID = 2082,  Entity_ID = 1 :
    Cap_Entry = 1 :
                    Cap_Type = 0
Switch#
```

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

```
Switch# show issu capability groups 2082
Client_ID = 2082,  Entity_ID = 1 :
    Cap_Group = 1 :
          Cap_Entry = 1
                      Cap_Type = 0
Switch#
```

Related Commands	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.

Command Default

Displays a list of clients registered to the ISSU infrastructure at the supervisor engine where the command is entered.

Command Modes

User EXEC mode

Command History

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
```

Related Commands	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.

Command Default   This command has no default settings.

Command Modes   User EXEC mode

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 Cisco IOS ISSU image. The ISSU infrastructure performs a matrix lookup as soon as the communication with the standby supervisor engine is established. There are three possible results from the lookup operation:

- Compatible—The Base-level system infrastructure and all optional HA-aware subsystems are compatible. In-service upgrade or downgrade between these versions will succeed with minimal service impact.

- Base-Level Compatible—One or more of the optional HA-aware subsystems are not compatible. Although an in-service upgrade or downgrade between these versions will succeed, some subsystems will not be able to maintain their state during the switchover. Prior to attempting an in-service upgrade or downgrade, the impact of this on operation and service of the switch must be considered carefully.

• Incompatible—A set of core system infrastructure must be able to execute in a stateful manner for SSO to function correctly. If any of these "required" features or subsystems is not compatible in two different Cisco IOS images, the two versions of the Cisco IOS images are declared "Incompatible". This means that an in-service upgrade or downgrade between these versions is not possible. The systems operates in RPR mode during the period when the versions of Cisco IOS at the active and standby supervisor engines differ.

Examples   This example displays negotiated compatibility matrix information:

```
Switch# show issu comp-matrix negotiated

CardType: WS-C4507R(112), Uid: 2, Image Ver: 12.2(31)SGA
Image Name: cat4500-ENTSERVICES-M

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    301    262182  19      1         COMPATIBLE
4004    401    262146  22      1         COMPATIBLE
4005    1      262149  4       1         COMPATIBLE


Message group summary:
Cid     Eid    GrpId   Sid     pSid    pUid    Nego Result
=============================================================
2       1      1       262151  3       1       Y
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       262147  26      1       Y
2008    1      2       262168  27      1       Y
2010    1      1       262171  32      1       Y
2012    1      1       262180  31      1       Y
2021    1      1       262170  41      1       Y
2022    1      1       262152  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       262150  37      1       Y
2082    1      1       262161  39      1       Y
2083    1      1       262184  20      1       Y
2084    1      1       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  22      1       Y
4005    1      1       262149  4       1       Y


List of Clients:
Cid      Client Name            Base/Non-Base
=============================================
2        ISSU Proto client      Base
3        ISSU RF                Base
4        ISSU CF client         Base
5        ISSU Network RF client Base
7        ISSU CONFIG SYNC       Base
```

```
8          ISSU ifIndex sync       Base
9          ISSU IPC client         Base
10         ISSU IPC Server client  Base
11         ISSU Red Mode Client    Base
100        ISSU rfs client         Base
110        ISSU ifs client         Base
200        ISSU Event Manager clientBase
2002       CEF Push ISSU client    Base
2003       ISSU XDR client         Base
2004       ISSU SNMP client        Non-Base
2008       ISSU Tableid Client     Base
2010       ARP HA                  Base
2012       ISSU HSRP Client        Non-Base
2021       XDR Int Priority ISSU cliBase
2022       XDR Proc Priority ISSU clBase
2023       FIB HWIDB ISSU client   Base
2024       FIB IDB ISSU client     Base
2025       FIB HW subblock ISSU clieBase
2026       FIB SW subblock ISSU clieBase
2027       Adjacency ISSU client   Base
2028       FIB IPV4 ISSU client    Base
2054       ISSU process client     Base
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
2071       ISSU Switch VLAN client  Non-Base
2072       ISSU dot1x client       Non-Base
2073       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
2082       ISSU IP Host client     Non-Base
2083       ISSU Inline Power client Non-Base
2084       ISSU IGMP Snooping clientNon-Base
4001       ISSU C4K Chassis client  Base
4002       ISSU C4K Port client    Base
4003       ISSU C4K Rkios client   Base
4004       ISSU C4K HostMan client  Base
4005       ISSU C4k GaliosRedundancyBase
```

This example displays stored compatibility matrix information:

```
Switch> show issu comp-matrix stored

Number of Matrices in Table = 1

        (1) Matrix for cat4500-ENTSERVICES-M(112) - cat4500-ENTSERVICES-M(112)
        =========================================
        Start Flag (0xDEADBABE)

                My Image ver:  12.2(31)SGA
                Peer Version    Compatibility
                ------------    -------------
                12.2(31)SGA             Comp(3)
```

Related Commands	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

Command Default

This command has no default settings.

Command Modes

User EXEC mode

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. The endpoints correspond to the slot numbers for the supervisor engine. The ISSU infrastructure communicates between these two endpoints to establish session and to perform session negotiation for ISSU clients.

Examples

The following example shows how to display the ISSU endpoints:

```
Switch# show issu endpoints
My_Unique_ID = 1/0x1,  Client_Count = 46

 This endpoint communicates with 1 peer endpoints :
   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#
```

Related Commands

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

client_id	(Optional) ISSU client ID.

Command Default

This command has no default settings.

Command Modes

User EXEC mode

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
Client_ID = 2072 :
    Entity_ID = 1,  Entity_Name = ISSU dot1x entity :
      MsgType MsgGroup CapType CapEntry CapGroup
        Count    Count    Count    count    Count
         28        1        1        1        1
Switch#
```

Related Commands

Command	Description
show issu clients	Displays the ISSU clients.

show issu fsm

Note 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.

Command Default This command has no default settings.

Command Modes User EXEC mode

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
Switch#
```

Related Commands

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.

Command Default

If client ID is not specified, displays message groups or message types information for all clients registered to the ISSU infrastructure.

Command Modes

User EXEC mode

Command History

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:

```
Switch#show issu message groups 2082
Client_ID = 2082,  Entity_ID = 1 :
    Message_Group = 1 :
                  Message_Type = 1,  Version_Range = 1 ~ 2
                  Message_Type = 2,  Version_Range = 1 ~ 2
Switch#
```

The following example shows how to display the message types for Client_id 2082:

```
Switch#show issu message types 2082
Client_ID = 2082,  Entity_ID = 1 :
    Message_Type = 1,  Version_Range = 1 ~ 2
          Message_Ver = 1,    Message_Mtu = 12
          Message_Ver = 2,    Message_Mtu = 8
    Message_Type = 2,  Version_Range = 1 ~ 2
          Message_Ver = 1,    Message_Mtu = 32
          Message_Ver = 2,    Message_Mtu = 28
Switch#
```

Related Commands	**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.

Command Default   Displays negotiated capability or version information for all ISSU sessions.

Command Modes   User EXEC mode

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
```

Related Commands	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.

Command Default   This command has no default settings.

Command Modes   Priviledged EXEC mode

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#
```

Related Commands

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 **issu 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	*client_id* (Optional) Specifies the ISSU client ID.

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

Command Modes   User EXEC mode

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       26   PRIMARY    COMPATIBLE    1        1         0
                            (no policy)

    Negotiation Session Info for This Message Session:
        Nego_Session_ID = 26
        Nego_Session_Name = dot1x
        Transport_Mtu = 17884
Switch#
```

Related Commands

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.

Command Default

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#
```

Related Commands

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 l2protocol-tunnel

To display information about the Layer 2 protocol tunnel ports, use the **show l2protocol-tunnel** command. This command displays information for the interfaces with protocol tunneling enabled.

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

Syntax Description		
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 *expression*.	
exclude	(Optional) Displays information that excludes lines that match the *expression*.	
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 mode

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 l2protocol-tunnel
COS for Encapsulated Packets: 5

Port    Protocol Shutdown  Drop      Encapsulation Decapsulation Drop
                 Threshold Threshold Counter       Counter       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 l2protocol-tunnel summary
COS for Encapsulated Packets: 5

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

Related Commands	Command	Description
	l2protocol-tunnel	Enables protocol tunneling on an interface.
	l2protocol-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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Usage Guidelines   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   The following example shows how to display LACP statistical information for a specific channel group:

```
Switch# show lacp 1 counters
              LACPDUs         Marker       LACPDUs
Port        Sent  Recv    Sent   Recv    Pkts  Err
--------------------------------------------------
Channel 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.

The following 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     Key    Number   State
Fa4/1     saC     bndl  30s        32768       100     100    0xc1     0x75
Fa4/2     saC     bndl  30s        32768       100     100    0xc2     0x75
Fa4/3     saC     bndl  30s        32768       100     100    0xc3     0x75
Fa4/4     saC     bndl  30s        32768       100     100    0xc4     0x75
Switch#
```

Table 2-34 lists the output field definitions.

Table 2-34   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: • *bndl*—Port is attached to an aggregator and bundled with other ports. • *susp*—Port is in a suspended state; it is not attached to any aggregator. • *indep*—Port is in an independent state (not bundled but able to switch data traffic. In this case, LACP is not running on the partner port). • *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*

The following 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      System ID               Port Number     Age     Flags
Fa4/1     8000,00b0.c23e.d84e     0x81            29s     P
Fa4/2     8000,00b0.c23e.d84e     0x82            0s      P
Fa4/3     8000,00b0.c23e.d84e     0x83            0s      P
Fa4/4     8000,00b0.c23e.d84e     0x84            0s      P


          Port            Admin     Oper     Port
          Priority        Key       Key      State
Fa4/1     32768           200       200      0x81
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.

The following example shows how to display the LACP system identification:

```
Switch> show lacp sys-id
8000,AC-12-34-56-78-90
Switch>
```

The system identification is made up of the system priority and the system MAC address. The first two bytes are the system priority, and the last six bytes are the globally administered individual MAC address associated to the system.

Related Commands	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 license

To display information about the software license, use the **show license** command.

.**show license** [**agent** [**counters** | **session**] [**all** | **detail** [*feature-name*] | **feature** | **file** | **statistics** | **status** | **udi** | **right-to-use** | **summary** | **permanent** | **in-use** | **image levels** | **evaluation** | **expiring**]

Syntax Description

agent	Shows information about the software license agent.
all	Shows information about all licenses in the system.
detail *feature-name*	Shows detailed information about a specified licensed feature or about all licenses.
feature	Shows a list of licensed features available in an image
file	Shows license entries stored in the license file.
statistics	Shows license statistics information.
status	Shows information about supported license types and license operations, and provides device status.
udi	Shows all the unique device identifier (UDI) values that can be licensed in a system
right-to-use	Shows all PRTU licenses.
summary	Shows a brief summary of all licenses.
permanent	Show all available permanent licenses
in-use	Show all available in-use licenses
image levels	Shows license image levels
evaluation	Shows all evaluation licenses.
expiring	Shows all available expiring licenses.

Command Default   License-related information is not displayed

Command Modes   Privileged EXEC mode

Command History

Release	Modification
IOS XE 3.1.0	Support for **show license** introduced on the Catalyst 4500 series switches.
IOS XE 3.4.2	Keyword **right-to-use** introduced on the Catalyst 4500 series switches

Usage Guidelines   Use this command to display license information and to help with troubleshooting issues related to Cisco IOS software licenses. It displays all the licenses in the system.

This command also displays those features that are available but not licensed to execute (i.e., multiple license can be active but not in use (execute) simultaneously. Only one type license can be used at a given time. Output is grouped according to how the features are stored in license storage (i.e., .where license information is stored on the device).

Examples).

These are examples of output from the show license agent command:

```
Switch# show license agent counters
License Agent Counters
Request Messages Received:0: Messages with Errors:0
Request Operations Received:0: Operations with Errors:0
Notification Messages Sent:1: Transmission Errors:0

Switch# show license agent session
License Agent Sessions: 0 open, maximum is 9

Switch# show license ?
agent show license agent
all Displays All The License(s).
call-home Show license call-home information
detail Displays Details Of A Given License.
evaluation Displays Evaluation License(s)
expiring Displays Expiring License(s).
feature Displays License Enabled Features.
file Displays All The License File(s).
handle show license handle
image show license image level
in-use Displays License That Are In-Use.
permanent Displays Permanent License(s)
right-to-use show permanent right-to-use licenses
statistics Displays License Statistics.
status Displays License Status.
summary Displays Brief Summary Of All License(s).
udi Displays UDI Value
```

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

```
Switch# show license detail
Index: 1 Feature: entservices Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
Store Index: 0
Store Name: Dynamic Evaluation License Storage
Index: 2 Feature: entservices Version: 1.0
License Type: PermanentRightToUse
License State: Inactive
License Count: Non-Counted
Store Index: 1
Store Name: Dynamic Evaluation License Storage
Index: 3 Feature: ipbase Version: 1.0
License Type: PermanentRightToUse
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
Store Index: 3
Store Name: Dynamic Evaluation License Storage
Index: 4 Feature: ipbase Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Inactive
License Count: Non-Counted
License Priority: Low
Store Index: 2
Store Name: Dynamic Evaluation License Storage
```

This is an example of output from the **show license detail entservices** command:

```
Switch# show license detail entservices
Feature: entservices Period Left: 8 weeks 3 days
Index: 1 Feature: entservices Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
Store Index: 0
Store Name: Dynamic Evaluation License Storage
Index: 2 Feature: entservices Version: 1.0
License Type: PermanentRightToUse
License State: Inactive
License Count: Non-Counted
Store Index: 1
Store Name: Dynamic Evaluation License Storage
```

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

```
Switch# show license feature
Feature name Enforcement Evaluation Clear Allowed Enabled Right…
        ------------------------------------------
entservices true true true false true
ipbase true true true true true
lanbase false false true false false
internal_service true false true false false
```

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

```
Switch# show license file
License Store: Primary License Storage
License Index: 1
License: 11 ipbase 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS INFINITE_KEYS NEVER NEVER
NiL SLM_CODE CL_ND_LCK NiL *1DELA9XDSFSJXAH400 NiL NiL NiL 5_MINS WS-C4507R+EFOX1327G52D
xLt5Q1e2VJi03pzp3GSE3PrvxwyfO,SLjP0SXuZOq0f4QTXyc1pSQY51xj31fh7ZfTD6AskNyeUYT8sCUesi9IVKB8
5wsZSX1HZiXwOd9RHp3mjmnhxFDnS0e6UxjgXgqvV:$AQEBIf8B///kh4dluXv+U+xjUPlzoc3++jpV9d8He4jOuba
fbkmmOtaOYAoB3inJLnlLyv50VCuRqwInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFzsqlhKoJVlPyEvQ8H21MNUjVb
hoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=
Comment:
Hash: Z+EY3ce1csQlVpRGc5NNy5ypmds=
License Store: Dynamic License Storage
License Store: Primary License Storage
License Store: Dynamic License Storage
License Index: 0
License: 11 entservices 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE ADD INFINITE_KEYS
INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL NiL Ni NiL NiL 5_MINS NiL
BGf3gQnLuroDmnnMJMwWVa2ukR8kP2JZyinKpmOXpa32jwPuSBmHvcSRiSSaqBngV8$AQEBIQAB///FTlc+Qu1Xlg2
Z+yB2StUHHymf2w5PEw+cYg/hTOKYCI+oXi0jwBZ2iLrYTKYwxSSRqwInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFz
sqlhKoJVlPyEvQ8H21MNUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY
=
Comment:
Hash: RmO9Kumi8BFKq0wCAx2CcUDE6rg=
License Index: 1
License: 12 entservices 1.0 LONG TRIAL DISABLED DISABLED DISABLED STANDALONE ADD
INFINITE_KEYS INFINITE_KEYS 1 JAN 2006 1 JAN 2035 NiL NiL SLM_CODE DEMO NiL NiL Ni NiL NiL
5_MINS NOTLOCKEDNOTLOCKEDHBL
l1nG2zXePlBt,ifk7ZReL80LqzvzgRUCelWrBp41FC3jOKer6ZMT7XC4834W3Ev7fm1eXoWaK58t:oDeH5RI1V3dVE
2VpAnYb7WiKDz9En8PfrI7vewhayNbschEXBD9:tfPfir6GaALUFwsLxcqYzHuL2$AQEBIf8B///mCSo9+7kn+8zTC
3WX1YS9if+g0e8AjRRu1Jq3Kye4y8wv4c+Y9FHJ7Ro/mw7ERwqRqwInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFzsq
lhKoJVlPyEvQ8H21MNUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=
Comment:
Hash: 9w09jAFGBzi2w6XQCljLOBe2p+Y=
```

```
License Index: 2
License: 11 ipbase 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE ADD INFINITE_KEYS
INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL NiL Ni NiL NiL 5_MINS NiL
YXNJUtpFJiC2Rpdt1SJNVQBCpQUBNt59tdkJJTgKwmLTKj:vmp,sVkMiiRYLfMHQfj$AQEBIf8B//kagzg0R7bT5rn
6dVYVPUFmxB1UsblGgbkInHYo55DJzHE/Bqnlf9keNdSyzPbUhSRqwInXo3snsLU7rOtdOxoIxYZAo3LYmUJ+MFzsq
lhKoJVlPyEvQ8H21MNUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=
Comment:
Hash: H6zsXVLv9TFlmTfFGm0tK4VHJ2Q=
License Index: 3
License: 12 ipbase 1.0 LONG TRIAL DISABLED DISABLED DISABLED STANDALONE ADD INFINITE_KEYS
INFINITE_KEYS 1 JAN 2006 1 JAN 2035 NiL NiL SLM_CODE DEMO NiL NiL Ni NiL NiL 5_MINS
NOTLOCKEDNOTLOCKEDHBL
Zh0GdIANTlXwW6LJgQ95LB0aCazzbsjSOL4HUaqcySLcOvcLq,d04oTgS8pJbHIO3BaD0tgELHog9egQWj9bCJ3,sm
2jRaJkgkhYKO9BrbWYLOA,mO3Qe2E,TPJou8fms:LtvrfctzLbujmB0XcB68MPLm$AQEBIf8B//+O8JwRWipzfjtWl
AItclx+D6NLhKMyqS1hJoxCM1Txgw8BpmG5QQY5nCiE14CPvVKRqwInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFzsq
lhKoJVlPyEvQ8H21MNUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=
Comment:
Hash: S3Ks+G07ueugA9hMFPkXGTF12So=
```

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

```
Switch# show license statistics
Administrative statistics
Install success count: 4
Install failure count: 1
Install duplicate count: 0
Comment add count: 0
Comment delete count: 0
Clear count: 0
Save count: 0
Save cred count: 0
Client status Request success count 1 Request failure count 0 Release count 0 Global
Notify count 1
```

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

```
Switch# show license status
License Type Supported
permanent Non-expiring node locked license
extension Expiring node locked license
evaluation Expiring non node locked license
License Operation Supported install Install license clear Clear license annotate Comment
license save Save license revoke Revoke license call-home License call-home Call-home
Operation Supported show pak Display license pak via call-home install Install license via
call-home revoke Revoke license via call-home resend Fetch license via call-home Device
status Device Credential type: IMAGE Device Credential Verification: PASS Rehost Type:
DC_OR_IC
```

When you enter the **show license udi** command on WS-C4507R+E, this output appears:

```
Switch# show license udi
Device# PID SN UDI
------------------------------------------
*0 WS-C4507R+E FOX1327G52D WS-C4507R+E:FOX1327G52D
```

✎

Note   The **show license udi** command output shows details on the current switch.

Displays all the Right to use licenses present on the device and their status. It contains license details:
license state, licenses currently in use, and whether the EULA is accepted by the user.

```
Switch# show license right-to-use
License Store: Built-In License Storage
StoreIndex: 1   Feature: ipservices                        Version: 1.0
```

```
                     License Type: PermanentRightToUse
                     License State: Active, Not in Use, EULA accepted
                         Period used: 1  hour  50 minutes
                     License Priority: High
                     License Count: Non-Counted
```

This is an example of the **show license summary** command:

```
Switch# show license summary
Index 0 Feature: entservices
Period left: 8 weeks 3 days
License Type: Evaluation
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
Index 1 Feature: ipbase
Period left: Life time
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
Index 2 Feature: lanbase
Period left: 0 seconds
Index 3 Feature: internal_service
Period left: 0 seconds
```

This is an example of the **show license evaluation** command:

```
Switch# show license evaluation
License Store: Primary License Storage
License Store: Dynamic License Storage
StoreIndex: 0 Feature: entservices Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
StoreIndex: 2 Feature: ipbase Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 4 days
License State: Inactive
License Count: Non-Counted
License Priority: None
```

This is an example of the **show license image levels** command:

```
Switch# show license image levels
Module name Image level Priority Configured Valid license
         ------------------------------------
WS-X45-SUP7-E entservices 1 NO entservices
ipbase 2 NO ipbase
lanbase 3 NO lanbase

Module Name Role Current Level Reboot Level
         ------------------------------------
WS-X45-SUP7-E Active ipbase ipbase
```

This is an example of the **show license expiring** command

```
Switch# show license expiring
License Store: Primary License Storage
License Store: Dynamic License Storage
StoreIndex: 0 Feature: entservices Version: 1.0
```

```
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
License State: Active, Not in Use, EULA accepted
License Count: Non-Counted
License Priority: Low
StoreIndex: 2 Feature: ipbase Version: 1.0
License Type: Evaluation
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 4 days
License State: Inactive
License Count: Non-Counted
License Priority: None
Switch#
```

This is an example of the **show license in-use** command

```
Switch# show license in-use
License Store: Primary License Storage
StoreIndex: 1 Feature: ipbase Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
License Store: Dynamic License Storage
```

show link state group

To display link state group information, use the **show link state group** command in user EXEC or privileged EXEC mode.

show link state group detail

Syntax Description	detail	Displays detailed information about the group.

Command Default   None

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History	Release	Modification
	15.1(1)S	This command was introduced.

Examples   The following example displays the link-state group information:

```
Switch# enable
Switch# show link state group 1
Link State Group: 1 Status: Enabled, Down
Router> show link state group detail
(Up):Interface up (Dwn):Interface Down (Dis):Interface disabled
Link State Group: 1 Status: Enabled, Down
Upstream Interfaces : Gi3/5(Dwn) Gi3/6(Dwn)
Downstream Interfaces : Gi3/1(Dis) Gi3/2(Dis) Gi3/3(Dis) Gi3/4(Dis)
Link State Group: 2 Status: Enabled, Down
Upstream Interfaces : Gi3/15(Dwn) Gi3/16(Dwn) Gi3/17(Dwn)
Downstream Interfaces : Gi3/11(Dis) Gi3/12(Dis) Gi3/13(Dis) Gi3/14(Dis)
(Up):Interface up (Dwn):Interface Down (Dis):Interface disabled
```

Related Commands	Command	Description
	link state track	Configures the link state group and enables link state tracking.
	link state group	Configures the link state group and interface, as either an upstream or downstream interface in the group.

show mab

To display MAC authentication bypass (MAB) information, use the **show mab** command in EXEC mode.

> **show mab** {**interface** *interface interface-number* | **all**} [**detail**]

Syntax Description

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

Command Default   None.

Command Modes   Privileged EXEC mode

Command History

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

Usage Guidelines   Table 2-35 lists the fields in the **show mab** command.

Table 2-35   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 2-36 lists the possible values for the state of the MAB state machine.

Table 2-36   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 2-36   MAB State Machine Values (continued)

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

Table 2-37 lists the possible displayed values for the MAB authorization status.

Table 2-37   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
```

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

```
Switch# show mab interface GigaEthernet1/3
MAB details for GigaEthernet1/3
-------------------------------------
Mac-Auth-Bypass = Enabled
Inactivity Timeout = None
```

The following example shows how to display detailed MAB information for a specific interface:

```
Switch# show mab interface gigabitethernet1/1 detail
MAB details for GigaEthernet1/1
-------------------------------------
Mac-Auth-Bypass = Enabled
Inactivity Timeout = None
MAB Client List
---------------
Client MAC = 000f.23c4.a401
MAB SM state = TERMINATE
Auth Status = AUTHORIZED
Switch#
```

Related Commands

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 **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, **port-channel**, and **ge-wan**.
	interface-number	(Optional) Specifies the port number.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History	Release	Modification
	12.1(19)EW	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 The following example shows how to display the ACL configuration on interface fast 6/1:

```
Switch# show mac access-group interface fast 6/1
Interface FastEthernet6/1:
   Inbound access-list is simple-mac-acl
   Outbound access-list is not set
```

Related Commands	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* | **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 **fastethernet**, **gigabitethernet**, and **tengigabitethernet**.
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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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

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

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

Related Commands

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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#
```

The following example shows how to display the currently configured aging time for a specific VLAN:

```
Switch# show mac-address-table aging-time vlan 100
Vlan    Aging Time
----    ----------
 100    300

Switch#
```

Related Commands

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) Specifies a VLAN; valid values are from 1 to 4094.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
12.1(12c)EW	Added support for extended VLAN addresses.

Examples

The following example shows how to display the entry count for a specific VLAN:

```
Switch# show mac-address-table count vlan 1
MAC Entries for Vlan 1:
Dynamic Unicast Address Count:              0
Static Unicast Address (User-defined) Count:   0
Static Unicast Address (System-defined) Count: 1
Total Unicast MAC Addresses In Use:         1
Total Unicast MAC Addresses Available:      32768
Multicast MAC Address Count:                1
Total Multicast MAC Addresses Available:    16384
Switch#
```

Related Commands

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 *type* are **fastethernet**, **gigabitethernet**, and **tengigabitethernet**.
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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following example shows how to display all the dynamic MAC address entries:

```
Switch# show mac-address-table dynamic
Unicast Entries
 vlan   mac address      type       protocols                 port
-------+---------------+--------+--------------------+--------------------
    1   0000.0000.0201   dynamic  ip                   FastEthernet6/15
    1   0000.0000.0202   dynamic  ip                   FastEthernet6/15
    1   0000.0000.0203   dynamic  ip,assigned          FastEthernet6/15
    1   0000.0000.0204   dynamic  ip,assigned          FastEthernet6/15
    1   0000.0000.0205   dynamic  ip,assigned          FastEthernet6/15
    2   0000.0000.0101   dynamic  ip                   FastEthernet6/16
    2   0000.0000.0102   dynamic  ip                   FastEthernet6/16
    2   0000.0000.0103   dynamic  ip,assigned          FastEthernet6/16
    2   0000.0000.0104   dynamic  ip,assigned          FastEthernet6/16
    2   0000.0000.0105   dynamic  ip,assigned          FastEthernet6/16
Switch#
```

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

```
Switch# show mac-address-table dynamic protocol assigned
Unicast Entries
 vlan   mac address      type       protocols                 port
-------+---------------+--------+--------------------+--------------------
    1   0000.0000.0203   dynamic  ip,assigned          FastEthernet6/15
    1   0000.0000.0204   dynamic  ip,assigned          FastEthernet6/15
    1   0000.0000.0205   dynamic  ip,assigned          FastEthernet6/15
    2   0000.0000.0103   dynamic  ip,assigned          FastEthernet6/16
    2   0000.0000.0104   dynamic  ip,assigned          FastEthernet6/16
    2   0000.0000.0105   dynamic  ip,assigned          FastEthernet6/16
Switch#
```

Related Commands

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 **ethernet**, **fastethernet**, **gigabitethernet**, and **tengigabitethernet**.
slot/port	Number of the slot and port.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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

The following example shows how to display MAC address table information for a specific interface:

```
Switch# show mac-address-table interface fastethernet6/16
Unicast Entries
 vlan   mac address     type        protocols               port
-------+---------------+--------+---------------------+--------------------
   2    0000.0000.0101  dynamic other                   FastEthernet6/16
   2    0000.0000.0102  dynamic other                   FastEthernet6/16
   2    0000.0000.0103  dynamic other                   FastEthernet6/16
   2    0000.0000.0104  dynamic other                   FastEthernet6/16
   2    0000.0000.0105  dynamic other                   FastEthernet6/16
   2    0000.0000.0106  dynamic other                   FastEthernet6/16

Multicast Entries
 vlan    mac address    type    ports
-------+---------------+-------+-----------------------------------------
   2    ffff.ffff.ffff  system Fa6/16
Switch#
```

Related Commands

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 learning

To display the status of MAC address learning for all VLANs or a specified VLAN, use the **show mac address-table learning** user EXEC command.

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

Syntax Description		
vlan *vlan-id*	(Optional) Displays information for a specific VLAN. The range is 1 to 4094.	
| begin	(Optional) Displays the line that matches the *expression*.	
| exclude	(Optional) Displays excluded lines that match the *expression*.	
| include	(Optional) Displays included lines that match the specified *expression*.	
expression	(Optional) Specifies the expression in the output as a reference point.	

Command Default MAC address learning is enabled on all VLANs.

Command Modes User EXEC

Command History	Release	Modification
	12.2(54)SG	This command was modified to support the learning disable feature on the Catalyst 4500 series switch.

Usage Guidelines To display configured VLANs, and whether MAC address learning is enabled or disabled, use the **show mac address-table learning** command without keywords. .

To display the learning status on an individual VLAN, use the command with a specific VLAN ID.

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

Examples The following example shows that MAC address learning is disabled on VLAN 200:

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

Related Commands	Command	Description
	mac-address-table learning vlan	Enables or disables MAC address learning on a 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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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

The following example shows how to display multicast MAC address table information for a specific VLAN:

```
Switch# show mac-address-table multicast vlan 1
Multicast Entries
 vlan    mac address      type    ports
-------+--------------+-------+----------------------------------------
   1    ffff.ffff.ffff   system Switch,Fa6/15
Switch#
```

The following example shows how to display the number of multicast MAC entries for all VLANs:

```
Switch# show mac-address-table multicast count
MAC Entries for all vlans:
Multicast MAC Address Count:            141
Total Multicast MAC Addresses Available:   16384
Switch#
```

Related Commands	**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**] | [**learn-fail**]

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.
learn-fail	(Optional) Displays general information of hardware MAC learning failure notifications.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.2(31)SG	This command was introduced on the Catalyst 4500 series switch.
12.2(52)SG	Support for **learn-fail** keyword, Supervisor Engine 6-E, and Catalyst 4900M chassis added.

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

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

Examples The following example shows how to display all the MAC address notification information:

```
Switch# show mac-address-table notification change
MAC Notification Feature is Enabled on the switch
Interval between Notification Traps : 1 secs
Number of MAC Addresses Added : 5
Number of MAC Addresses Removed : 1
Number of Notifications sent to NMS : 3
Maximum Number of entries configured in History Table : 500
Current History Table Length : 3
MAC Notification Traps are Enabled
```

```
History Table contents
----------------------
History Index 1, Entry Timestamp 478433, Despatch Timestamp 478433
MAC Changed Message :
Operation: Added   Vlan: 1    MAC Addr: 1234.5678.9ab0 Dot1dBasePort: 323
History Index 2, Entry Timestamp 481834, Despatch Timestamp 481834
MAC Changed Message :
Operation: Added   Vlan: 1    MAC Addr: 1234.5678.9ab1 Dot1dBasePort: 323
Operation: Added   Vlan: 1    MAC Addr: 1234.5678.9ab2 Dot1dBasePort: 323
Operation: Added   Vlan: 1    MAC Addr: 1234.5678.9ab3 Dot1dBasePort: 323
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#
```

The following 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#
```

The following example shows how to display the MAC address move status:

```
Switch# show mac-address-table notification mac-move
MAC Move Notification: Enabled
Switch#
```

The following 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#
```

The following example shows how to display general information of MAC learning failure notifications:

```
Switch# show mac address-table notification learn-fail
Status      limit       Interval
-------------+-----------+-------------
   disabled      2000         120
```

Related Commands	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.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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 The following example shows how to display the MAC address table entries that have a specific protocol type (in this case, assigned):

```
Switch# show mac-address-table protocol assigned
vlan   mac address     type     protocol  qos             ports
-----+---------------+--------+---------+---+-------------------------------
 200  0050.3e8d.6400  static   assigned  --  Switch
 100  0050.3e8d.6400  static   assigned  --  Switch
   5  0050.3e8d.6400  static   assigned  --  Switch
4092  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
Switch#
```

The following example shows the other output for the previous example:

```
Switch# show mac-address-table protocol other
Unicast Entries
 vlan   mac address     type        protocols             port
-------+---------------+--------+--------------------+--------------------
    1   0000.0000.0201  dynamic other                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

Multicast Entries
 vlan    mac address    type    ports
-------+---------------+-------+------------------------------------------
    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#
```

Related Commands

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 *type* are **fastethernet**, **gigabitethernet**, and **tengigabitethernet**.
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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following 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

Multicast Entries
 vlan    mac address    type    ports
-------+---------------+-------+-----------------------------------------
    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#
```

The following 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
-------+---------------+-------+-----------------------------------------
    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#
```

Related Commands

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.

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.	

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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

The following 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         protocols             port
-------+--------------+--------+--------------------+--------------------
    1   0000.0000.0201   dynamic ip                    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

Multicast Entries
 vlan   mac address     type     ports
-------+--------------+-------+-----------------------------------------
    1   ffff.ffff.ffff   system Switch,Fa6/15
Switch#
```

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

```
Switch# show mac-address-table vlan 100 protocol other
Unicast Entries
 vlan   mac address     type         protocols             port
-------+--------------+--------+--------------------+--------------------
    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

Multicast Entries
 vlan   mac address     type     ports
-------+--------------+-------+-----------------------------------------
    1   ffff.ffff.ffff   system Switch,Fa6/15
Switch#
```

Related Commands

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 macro auto mac-address-group

Use the **show macro auto mac-address-group** command to display the configuration of MAC address group.

show macro auto mac-address-group

Syntax Description	No keywords

Command History

Release	Modification
12.2(54)SG	This command was introduced on the Catalyst 4500 series switch.

Examples

The following example shows how to displaythe configuration of the MAC address group:

```
Switch# show macro auto address-group
MAC Address Group Configuration:

Group Name                     OUI        MAC ADDRESS
-------------------------------------------------------------
testGroup                                 2222.2222.2222
                                                 1111.1111.1111
```

show macro auto device

Use the **show macro auto device** global configuration command to display the default information for a device, including builtin function name and the parameters that can be provided for the commands when executing the builtin function.

> **show macro auto device** *device_id*

Syntax Description	*device_id*	Specifies the device ID.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
12.2(54)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines This command displays the default values as well as the currently used values if configured.

Examples The following example shows how to display the default information for the device access-point:

```
Switch# show macro auto device access-point
Device:access-point
Default Macro:CISCO_AP_AUTO_SMARTPORT
Current Macro:CISCO_AP_AUTO_SMARTPORT
Configurable Parameters:NATIVE_VLAN
Defaults Parameters:NATIVE_VLAN=1
Current Parameters:NATIVE_VLAN=1
```

Related Commands

Command	Description
show macro auto event manager	Refer to the Command Reference in the IOS library
show macro auto interface	Display Auto SmartPorts status and the functions applied on an interface.

show macro auto interface

Use the **show macro auto interface** command to display Auto SmartPorts status and the functions applied on an interface.

show macro auto interface *interface_id*

Syntax Description

interface_id	Specifies an interface ID.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
12.2(54)SG	This command was introduced on the Catalyst 4500 series switch.

Examples   The following example shows how to display Auto SmartPorts status and the applied macros:

```
Switch# show macro auto int gi3/8
 Global Auto Smart Port Status
 Auto Smart Ports Enabled
 Fallback : CDP  Disabled, LLDP Disabled
Interface     Auto Smart Port   Fallback    Macro Description(s)
-------------------------------------------------------------
Gi3/8         TRUE              None        CISCO_PHONE_EVENT
```

Related Commands

Command	Description
show macro auto device	Displays the default information for a device, including builtin function name and the parameters that can be provided for the commands when executing the builtin function.

show macro auto monitor clients

To display the clients using the device classifier facility on the switch, use the **show macro auto monitor clients** user EXEC command.

show macro auto monitor clients

Syntax Description	This command has no arguments or keywords.

Command Default

User EXEC
Privileged EXEC

Command History

Release	Modification
Release IOS XE 3.3.0 SG (15.1(1)SG)	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines

Device classifier (DC) is enabled by default when you enable a client application (for example, Auto Smartports) that uses its functionality. Use the **show macro auto monitor clients** command to display the clients that are using the DC feature on the switch.

As long as any clients are using the DC, you cannot disable it by using the **no macro auto monitor** command. If you attempt to disable the DC while a client is using it, an error message appears.

Examples

The following example shows how to use the **show macro auto monitor clients** privileged EXEC command to view the clients using the DC on the switch:

```
Switch# show macro auto monitor clients
Client Name
===================
Auto Smart Ports
```

The following example shows the error message that appears when you attempt to disable DC while a client is using it:

```
Switch(config)# no macro auto monitor
These subsystems should be disabled before disabling Device classifier
Auto Smart Ports

% Error - device classifier is not disabled
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute (built-in function)	Configures mapping from an event trigger to a built-in macro.
macro auto global processing	Enables Auto Smartports on a switch.

Command	Description
macro auto mac-address-group	Configures MAC address groups.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto monitor type	Displays all the device types recognized by the device classifier.
show shell triggers	Displays information about event triggers and macros.

show macro auto monitor device

To display the devices connected to a switch and their associated properties, use the **show macro auto monitor device** user EXEC command.

show macro auto monitor device [**detail** | **filter** *string* | **interface** *interface_id* | **mac-address** *mac_address*]

Syntax Description		
	detail	Displays detailed device classifier information.
	filter *string*	Displays information for devices that match the filter.
	interface *interface_id*	Displays information about devices attached to the specified interface.
	mac *mac_address*	Displays device information for the specified endpoint.

Command Modes   User EXEC
Privileged EXEC

Command History	Release	Modification
	Release IOS XE 3.3.0 SG (15.1(1)SG)	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines   Use this command to display the devices connected to a switch. Use the **show macro auto device** privileged EXEC command to display the configurable parameters for a device.

Examples   The following example shows how to use the **show macro auto monitor device** privileged EXEC command with no optional keywords to view the devices connected to the switch:

```
Switch# show macro auto monitor device
MAC_Address          Port_Id          Profile Name
==============    =======    ===========================
000a.b8c6.1e07    Gi1/0/2    Cisco-Device
001f.9e90.1250    Gi1/0/4    Cisco-AP-Aironet-1130
=========================================================
```

The following example shows how to use the **show macro auto monitor device** privileged EXEC command with the optional **mac-address** keyword to view summary information about the connected device with the specified MAC address:

```
Switch# show macro auto monitor device mac-address 001f.9e90.1250
MAC_Address        Port_Id      Profile Name
==============    =======    ===========================
001f.9e90.1250    Gi1/0/4    Cisco-AP-Aironet-1130
=========================================================
```

The following example shows how to use the **show macro auto monitor device** privileged EXEC command with the optional **mac-address** and **detail** keywords to view detailed information about the connected device with the specified MAC address:

```
Switch# show macro auto monitor device mac-address 001f.9e90.1250 detail
MAC_Address      Port_Id    Certainty Parent    ProfileType  Profile Name
Device_Name
==============   =======    ========= ======    ===========
=========================   ===========
001f.9e90.1250   Gi1/0/4    40        2         Built-in     Cisco-AP-Aironet-1130
cisco AIR-LAP1131AG-E-K9
=================================================================================
=======
```

The following example shows how to use the **show macro auto monitor device** privileged EXEC command with the optional **interface** keyword to view summary information about the device connected to the specified interface:

```
Switch# show macro auto monitor device interface gi 1/0/2
MAC_Address           Port_Id         Profile Name
==============   =======    =============================
000a.b8c6.1e07   Gi1/0/2    Cisco-Device
====================================================
```

The following example shows how to use the **show macro auto monitor device** privileged EXEC command with the optional **interface** and **detail** keywords to view detailed information about the device connected to the specified interface:

```
Switch# show macro auto monitor device interface gi 1/0/2 detail
MAC_Address      Port_Id    Certainty Parent    ProfileType  Profile Name
Device_Name
==============   =======    ========= ======    ===========
=========================   ===========
000a.b8c6.1e07   Gi1/0/2    10        0         Default      Cisco-Device       cisco
WS-C2960-48TT-L
=================================================================================
=======
```

Related Commands	Command	Description
	macro auto device	Configures macro default parameter values.
	macro auto execute (built-in function)	Configures mapping from an event trigger to a built-in macro.
	macro auto global processing	Enables Auto Smartports on a switch.
	macro auto mac-address-group	Configures MAC address groups.
	macro auto sticky	Configures macro persistence.
	shell trigger	Creates event triggers.
	show macro auto monitor clients	Displays all the device types recognized by the device classifier.
	show macro auto monitor type	Displays all the device types recognized by the device classifier.
	show shell triggers	Displays information about event triggers and macros.

show macro auto monitor type

To display all the device types recognized by the device classifier, use the **show macro auto monitor type** user EXEC command.

show macro auto monitor type [**table** [*built-in* | *default*] | **string** *filter_string*]

Syntax Description

table	Displays device classification in a table.
built-in	Displays device classification information from the built-in device table.
default	Displays device classification information from the default device table.
filter *string*	Displays information for devices that match the filter.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
Release IOS XE 3.3.0 SG (15.1(1)SG)	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines

This command displays all the device types recognized by the device classification engine. The number of available device types is the number of profiles stored on the switch. Because the number of profiles can be very large, you can use the **filter** keyword to limit the command output.

Examples

The following example shows how to use the **show macro auto monitor type** privileged EXEC command with no optional keywords to view the devices recognized by the device classifier:

```
Switch# show macro auto monitor type table
  Valid        Type       Profile Name                    min Conf   ID
=========== ========= ================== ======== ====
  Valid      Default    Apple-Device                         10        0
  Valid      Default    Aruba-Device                         10        1
  Valid      Default    Avaya-Device                         10        2
  Valid      Default    Avaya-IP-Phone                       20        3
  Valid      Default    BlackBerry                           20        4
  Valid      Default    Cisco-Device                         10        5
  Valid      Default    Cisco-IP-Phone                       20        6
  Valid      Default    Cisco-IP-Phone-7902                  70        7
  Valid      Default    Cisco-IP-Phone-7905                  70        8
  Valid      Default    Cisco-IP-Phone-7906                  70        9
  Valid      Default    Cisco-IP-Phone-7910                  70       10
  Valid      Default    Cisco-IP-Phone-7911                  70       11
  Valid      Default    Cisco-IP-Phone-7912                  70       12
  Valid      Default    Cisco-IP-Phone-7940                  70       13
  Valid      Default    Cisco-IP-Phone-7941                  70       14
  Valid      Default    Cisco-IP-Phone-7942                  70       15
```

```
Valid      Default      Cisco-IP-Phone-7945                     70      16
Valid      Default      Cisco-IP-Phone-7945G                    70      17
Valid      Default      Cisco-IP-Phone-7960                     70      18
Valid      Default      Cisco-IP-Phone-7961                     70      19
Valid      Default      Cisco-IP-Phone-7962                     70      20
Valid      Default      Cisco-IP-Phone-7965                     70      21
Valid      Default      Cisco-IP-Phone-7970                     70      22
Valid      Default      Cisco-IP-Phone-7971                     70      23
Valid      Default      Cisco-IP-Phone-7975                     70      24
Valid      Default      Cisco-IP-Phone-7985                     70      25
Valid      Default      Cisco-IP-Phone-9971                     70      26
Valid      Default      Cisco-WLC-2100-Series                   40      27
Valid      Default      DLink-Device                            10      28
Valid      Default      Enterasys-Device                        10      29
Valid      Default      HP-Device                               10      30
Valid      Default      HP-JetDirect-Printer                    30      31
Valid      Default      Lexmark-Device                          10      32
Valid      Default      Lexmark-Printer-E260dn                  30      33
Valid      Default      Microsoft-Device                        10      34
Valid      Default      Netgear-Device                          10      35
Valid      Default      NintendoWII                             10      36
Valid      Default      Nortel-Device                           10      37
Valid      Default      Nortel-IP-Phone-2000-Series             20      38
Valid      Default      SonyPS3                                 10      39
Valid      Default      XBOX360                                 20      40
Valid      Default      Xerox-Device                            10      41
Valid      Default      Xerox-Printer-Phaser3250                30      42
Valid      Default      Aruba-AP                                20      43
Valid      Default      Cisco-Access-Point                      10      44
Valid      Default      Cisco-IP-Conference-Station-7935        70      45
Valid      Default      Cisco-IP-Conference-Station-7936        70      46
Valid      Default      Cisco-IP-Conference-Station-7937        70      47
Valid      Default      DLink-DAP-1522                          20      48
Valid      Default      Cisco-AP-Aironet-1130                   30      49
Valid      Default      Cisco-AP-Aironet-1240                   30      50
Valid      Default      Cisco-AP-Aironet-1250                   30      51
Valid      Default      Cisco-AIR-LAP                           25      52
Valid      Default      Cisco-AIR-LAP-1130                      30      53
Valid      Default      Cisco-AIR-LAP-1240                      50      54
Valid      Default      Cisco-AIR-LAP-1250                      50      55
Valid      Default      Cisco-AIR-AP                            25      56
Valid      Default      Cisco-AIR-AP-1130                       30      57
Valid      Default      Cisco-AIR-AP-1240                       50      58
Valid      Default      Cisco-AIR-AP-1250                       50      59
Invalid    Default      Sun-Workstation                         10      60
Valid      Default      Linksys-Device                          20      61
Valid      Default      LinksysWAP54G-Device                    30      62
Valid      Default      HTC-Device                              10      63
Valid      Default      MotorolaMobile-Device                   10      64
Valid      Default      VMWare-Device                           10      65
Valid      Default      ISE-Appliance                           10      66
Valid      Built-in     Cisco-Device                            10      0
Valid      Built-in     Cisco-Router                            10      1
Valid      Built-in     Router                                  10      2
Valid      Built-in     Cisco-IP-Camera                         10      3
Valid      Built-in     Cisco-IP-Camera-2xxx                    30      4
Valid      Built-in     Cisco-IP-Camera-2421                    50      5
Valid      Built-in     Cisco-IP-Camera-2500                    50      6
Valid      Built-in     Cisco-IP-Camera-2520                    50      7
Valid      Built-in     Cisco-IP-Camera-2530                    50      8
Valid      Built-in     Cisco-IP-Camera-4xxx                    50      9
Valid      Built-in     Cisco-Transparent-Bridge                8       10
Valid      Built-in     Transparent-Bridge                      8       11
Valid      Built-in     Cisco-Source-Bridge                     10      12
```

```
Valid       Built-in    Cisco-Switch                      10      13
Valid       Built-in    Cisco-IP-Phone                    20      14
Valid       Built-in    IP-Phone                          20      15
Valid       Built-in    Cisco-DMP                         10      16
Valid       Built-in    Cisco-DMP-4305G                   70      17
Valid       Built-in    Cisco-DMP-4310G                   70      18
Valid       Built-in    Cisco-DMP-4400G                   70      19
Valid       Built-in    Cisco-WLC-2100-Series             40      20
Valid       Built-in    Cisco-Access-Point                10      21
Valid       Built-in    Cisco-AIR-LAP                     30      22
Valid       Built-in    Cisco-AIR-AP                      30      23
Valid       Built-in    Linksys-Device                    20      24
```

Related Commands	Command	Description
	macro auto device	Configures macro default parameter values.
	macro auto execute (built-in function)	Configures mapping from an event trigger to a built-in macro.
	macro auto global processing	Enables Auto Smartports on a switch.
	macro auto mac-address-group	Configures MAC address groups.
	macro auto sticky	Configures macro persistence.
	shell trigger	Creates event triggers.
	show macro auto monitor clients	Displays all the device types recognized by the device classifier.
	show macro auto monitor device	Displays all the device types recognized by the device classifier.

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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
12.2(25)EW	Enhanced the output of the **show idprom interface command** 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."

Examples

The following example shows how to display information for all the modules.

The following 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
 2     6 1000BaseX (GBIC)                        WS-X4306         00000110
 3    18 1000BaseX (GBIC)                        WS-X4418         JAB025104WK
 5     0 Not enough power for module             WS-X4148-FX-MT   00000000000
 6    48 10/100BaseTX (RJ45)                     WS-X4148         JAB023402RP
```

```
 M MAC addresses                     Hw  Fw           Sw              Status
--+-------------------------------+---+------------+---------------+---------
 1 005c.9d1a.f9d0 to 005c.9d1a.f9df 0.5 12.1(11br)EW 12.1(20020313:00 Ok
 2 0010.7bab.9920 to 0010.7bab.9925 0.2                              Ok
 3 0050.7356.2b36 to 0050.7356.2b47 1.0                              Ok
 5 0001.64fe.a930 to 0001.64fe.a95f 0.0                              PwrDeny

 6 0050.0f10.28b0 to 0050.0f10.28df 1.0                              Ok
Switch#
```

The following 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 supervisor 2 (Active)   WS-X6K-SUP2-2GE   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)    Ok
Mod Sub-Module                  Model           Serial          Hw    Status
--- ------------------------- --------------- --------------- ------- -------
  2 Policy Feature Card 2      WS-F6K-PFC2     SAD04440HVU     1.0     Ok
  2 Cat4k MSFC 2 daughterboard WS-F6K-MSFC2    SAD04430J9K     1.1     Ok
Switch#
```

The following 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.
---+-----+-------------------------------------+-----------------+-----------
 1    6   XG (X2), 1000BaseX (SFP) Supervisor(ac WS-X4517          ""
 3    6   1000BaseX (GBIC)                       WS-X4306          00000110

 M MAC addresses                     Hw  Fw           Sw              Status
--+-------------------------------+---+------------+---------------+---------
 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                              Ok
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 from1 to 6.
detail	(Optional) Displays the detailed SPAN information for a session.

Command Default

The **detail** keyword only displays lines with a nondefault configuration.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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

The following 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
```

The following 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#
```

The following example shows how to display the detailed SPAN information for session 1:

```
Switch# show monitor session 1 detail
Session 1
---------
Type              : Local Session
Source Ports      :
    RX Only       : None
    TX Only       : None
    Both          : Gi1/1, CPU
Source VLANs      :
    RX Only       : None
    TX Only       : None
    Both          : None
Source RSPAN VLAN : Fa6/1
Destination Ports : Fa6/1
    Encapsulation : DOT1Q
          Ingress : Enabled, default VLAN = 2
Filter VLANs      : None
  Filter Types RX : Good
  Filter Types TX : None
Dest Rspan Vlan : 901
Ingress : Enabled, default VLAN=2
Learning : Disabled
IP Access-group : None
Switch#
```

The following 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 monitor capture

To display the capture point details, so that you can see what capture points are defined, what their attributes are, and whether they are active, use the **show monitor capture** command.

show monitor capture [*name* [**parameter**] | **buffer** [**brief** | **detailed** | **dump**]]

Syntax Description

name	Specifies the capture point name.
parameter	Reconstructs and displays the exec commands for specifying the capture point.
buffer [**brief** | **detailed** | **dump**]	Source the packets from the capture buffer, decode and display them in brief, detailed or dump mode.

Command Default

If the capture point name is not provided, the command displays all the capture point details.

If the display mode is not specified, the command defaults to brief mode.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
IOS XE 3.3.0SG/ 15.1(1)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines

When the command is issued with no parameters, it displays the details of all the capture points. When specified with a capture point name and no other parameters, it displays the details of the specific capture point name. With the **parameter** keyword, the command reconstructs the commands that describe the capture point and displays them.

The **buffer** option displays the packets from the capture buffer. This option is applicable only if the capture point directs the captured packets to the buffer. The packets can be decoded and displayed in either the brief, detailed, or dump mode. The default mode is **brief**.

Examples

Following are example of how to use the **show monitor capture** command:

```
Switch# show monitor capture mycap buffer brief
  0.000000   10.1.1.215 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  1.000000   10.1.1.216 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  2.000000   10.1.1.217 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  3.000000   10.1.1.218 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  4.000000   10.1.1.219 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  5.000000   10.1.1.220 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  6.000000   10.1.1.221 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  7.000000   10.1.1.222 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  8.000000   10.1.1.223 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
  9.000000   10.1.1.224 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
 10.000000   10.1.1.225 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
 11.000000   10.1.1.226 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
```

```
     12.000000   10.1.1.227 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     13.000000   10.1.1.228 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     14.000000   10.1.1.229 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     15.000000   10.1.1.230 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     16.000000   10.1.1.231 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     17.000000   10.1.1.232 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     18.000000   10.1.1.233 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     19.000000   10.1.1.234 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     20.000000   10.1.1.235 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
     21.000000   10.1.1.236 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002
…
Switch# show monitor capture mycap buffer detailed
Frame 1: 256 bytes on wire (2048 bits), 256 bytes captured (2048 bits)
     Arrival Time: Apr 15, 2012 15:50:02.398966000 PDT
     Epoch Time: 1334530202.398966000 seconds
     [Time delta from previous captured frame: 0.000000000 seconds]
     [Time delta from previous displayed frame: 0.000000000 seconds]
     [Time since reference or first frame: 0.000000000 seconds]
     Frame Number: 1
     Frame Length: 256 bytes (2048 bits)
     Capture Length: 256 bytes (2048 bits)
     [Frame is marked: False]
     [Frame is ignored: False]
     [Protocols in frame: eth:ip:udp:data]
Ethernet II, Src: 00:00:00:00:03:01 (00:00:00:00:03:01), Dst: 54:75:d0:3a:85:3f
(54:75:d0:3a:85:3f)
     Destination: 54:75:d0:3a:85:3f (54:75:d0:3a:85:3f)
         Address: 54:75:d0:3a:85:3f (54:75:d0:3a:85:3f)
         .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
         .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
     Source: 00:00:00:00:03:01 (00:00:00:00:03:01)
         Address: 00:00:00:00:03:01 (00:00:00:00:03:01)
         .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
         .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
…
Switch# show monitor capture mycap buffer dump
   0.000000   10.1.1.215 -> 20.1.1.2     UDP Source port: 20001  Destination port: 20002

0000  54 75 d0 3a 85 3f 00 00 00 00 03 01 08 00 45 00   Tu.:.?........E.
0010  00 ee 00 00 00 00 40 11 59 25 0a 01 01 d7 14 01   ......@.Y%......
0020  01 02 4e 21 4e 22 00 da 6d e0 00 01 02 03 04 05   ..N!N"..m.......
0030  06 07 08 09 0a 0b 0c 0d 0e 0f 10 11 12 13 14 15   ................
0040  16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22 23 24 25   .......... !"#$%
0050  26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 32 33 34 35   &'()*+,-./012345
0060  36 37 38 39 3a 3b 3c 3d 3e 3f 40 41 42 43 44 45   6789:;<=>?@ABCDE
0070  46 47 48 49 4a 4b 4c 4d 4e 4f 50 51 52 53 54 55   FGHIJKLMNOPQRSTU
0080  56 57 58 59 5a 5b 5c 5d 5e 5f 60 61 62 63 64 65   VWXYZ[\]^_`abcde
0090  66 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 73 74 75   fghijklmnopqrstu
00a0  76 77 78 79 7a 7b 7c 7d 7e 7f 80 81 82 83 84 85   vwxyz{|}~.......
00b0  86 87 88 89 8a 8b 8c 8d 8e 8f 90 91 92 93 94 95   ................
00c0  96 97 98 99 9a 9b 9c 9d 9e 9f a0 a1 a2 a3 a4 a5   ................
00d0  a6 a7 a8 a9 aa ab ac ad ae af b0 b1 b2 b3 b4 b5   ................
00e0  b6 b7 b8 b9 ba bb bc bd be bf c0 c1 c2 c3 c4 c5   ................
00f0  c6 c7 c8 c9 ca cb cc cd ce cf d0 d1 03 3e d0 33   .............>.3
```

show monitor capture file

To decode and display packets from a previously captured .pcap file, use the **show monitor capture file** command.

show monitor capture file *name* [**display-filter** *filter-string*] [**brief** | **detailed** | **dump**]

Syntax Description

name	Specfies the filename.
display-filter *filter-string*	Specifies the display filter string according to Wireshark's display-filter syntax.
brief	**detailed**	**dump**	Determines the display mode. **brief**—Displays a one line summary of the packet with key fields **detailed**—Displays all the fields in the packet for the protocols supported and displays the payload in hexadecimal form. **dump**—Displays a one line summary of the packet with key fields and also displays the packet in hexadecimal form.

Command Default **brief**

Command Modes Privileged EXEC mode

Command History

Release	Modification
IOS XE 3.3.0SG/ 15.1(1)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines If no display filter is specified, then all the packets in the file are displayed. Because the display filter must observe the Wireshark display filter syntax, ensure that the display filter is accurate. Also, use a double quotes when specifying the filter.

Examples The following example shows how to display packets from a .pcap file with a display filter:

```
Switch# show monitor capture file bootflash:test.pcap display-filter
```

This example displays a brief output from a .pcap file:

```
Switch# show monitor capture file bootflash:mycap.pcap
  1   0.000000   10.1.1.140 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
  2   1.000000   10.1.1.141 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
  3   2.000000   10.1.1.142 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
```

```
    4   3.000000   10.1.1.143 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
    5   4.000000   10.1.1.144 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
    6   5.000000   10.1.1.145 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
    7   6.000000   10.1.1.146 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
    8   7.000000   10.1.1.147 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
    9   8.000000   10.1.1.148 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   10   9.000000   10.1.1.149 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   11  10.000000   10.1.1.150 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   12  11.000000   10.1.1.151 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   13  12.000000   10.1.1.152 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   14  13.000000   10.1.1.153 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   15  14.000000   10.1.1.154 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   16  15.000000   10.1.1.155 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   17  16.000000   10.1.1.156 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   18  17.000000   10.1.1.157 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   19  18.000000   10.1.1.158 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   20  19.000000   10.1.1.159 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   21  20.000000   10.1.1.160 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   22  21.000000   10.1.1.161 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   23  22.000000   10.1.1.162 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   24  23.000000   10.1.1.163 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   25  24.000000   10.1.1.164 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   26  25.000000   10.1.1.165 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   27  26.000000   10.1.1.166 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   28  27.000000   10.1.1.167 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   29  28.000000   10.1.1.168 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   30  29.000000   10.1.1.169 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   31  30.000000   10.1.1.170 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   32  31.000000   10.1.1.171 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   33  32.000000   10.1.1.172 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   34  33.000000   10.1.1.173 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
   35  34.000000   10.1.1.174 -> 20.1.1.2    UDP Source port: 20001  Destination port:
20002
```

```
 36  35.000000   10.1.1.175 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 37  36.000000   10.1.1.176 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 38  37.000000   10.1.1.177 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 39  38.000000   10.1.1.178 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 40  39.000000   10.1.1.179 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 41  40.000000   10.1.1.180 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 42  41.000000   10.1.1.181 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 43  42.000000   10.1.1.182 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 44  43.000000   10.1.1.183 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 45  44.000000   10.1.1.184 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 46  45.000000   10.1.1.185 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 47  46.000000   10.1.1.186 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 48  47.000000   10.1.1.187 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 49  48.000000   10.1.1.188 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 50  49.000000   10.1.1.189 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 51  50.000000   10.1.1.190 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 52  51.000000   10.1.1.191 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 53  52.000000   10.1.1.192 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 54  53.000000   10.1.1.193 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 55  54.000000   10.1.1.194 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 56  55.000000   10.1.1.195 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 57  56.000000   10.1.1.196 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 58  57.000000   10.1.1.197 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
 59  58.000000   10.1.1.198 -> 20.1.1.2     UDP Source port: 20001  Destination port:
20002
```

The following example shows how to display a detailed output from a .pcap file:

```
Switch# show monitor capture file bootflash:mycap.pcap detailed
Frame 1: 256 bytes on wire (2048 bits), 256 bytes captured (2048 bits)
    Arrival Time: Mar 21, 2012 14:35:09.111993000 PDT
    Epoch Time: 1332365709.111993000 seconds
    [Time delta from previous captured frame: 0.000000000 seconds]
    [Time delta from previous displayed frame: 0.000000000 seconds]
    [Time since reference or first frame: 0.000000000 seconds]
    Frame Number: 1
    Frame Length: 256 bytes (2048 bits)
    Capture Length: 256 bytes (2048 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
```

```
            [Protocols in frame: eth:ip:udp:data]
Ethernet II, Src: 00:00:00:00:03:01 (00:00:00:00:03:01), Dst: 54:75:d0:3a:85:3f
(54:75:d0:3a:85:3f)
    Destination: 54:75:d0:3a:85:3f (54:75:d0:3a:85:3f)
        Address: 54:75:d0:3a:85:3f (54:75:d0:3a:85:3f)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
    Source: 00:00:00:00:03:01 (00:00:00:00:03:01)
        Address: 00:00:00:00:03:01 (00:00:00:00:03:01)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
    Type: IP (0x0800)
    Frame check sequence: 0x03b07f42 [incorrect, should be 0x08fcee78]
Internet Protocol, Src: 10.1.1.140 (10.1.1.140), Dst: 20.1.1.2 (20.1.1.2)
    Version: 4
    Header length: 20 bytes
    Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
        0000 00.. = Differentiated Services Codepoint: Default (0x00)
        .... ..0. = ECN-Capable Transport (ECT): 0
        .... ...0 = ECN-CE: 0
    Total Length: 238
    Identification: 0x0000 (0)
    Flags: 0x00
        0... .... = Reserved bit: Not set
        .0.. .... = Don't fragment: Not set
        ..0. .... = More fragments: Not set
    Fragment offset: 0
    Time to live: 64
    Protocol: UDP (17)
    Header checksum: 0x5970 [correct]
        [Good: True]
        [Bad: False]
    Source: 10.1.1.140 (10.1.1.140)
    Destination: 20.1.1.2 (20.1.1.2)
User Datagram Protocol, Src Port: 20001 (20001), Dst Port: 20002 (20002)
    Source port: 20001 (20001)
    Destination port: 20002 (20002)
    Length: 218
    Checksum: 0x6e2b [validation disabled]
        [Good Checksum: False]
        [Bad Checksum: False]
Data (210 bytes)

0000  00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f   ................
0010  10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f   ................
0020  20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f    !"#$%&'()*+,-./
0030  30 31 32 33 34 35 36 37 38 39 3a 3b 3c 3d 3e 3f   0123456789:;<=>?
0040  40 41 42 43 44 45 46 47 48 49 4a 4b 4c 4d 4e 4f   @ABCDEFGHIJKLMNO
0050  50 51 52 53 54 55 56 57 58 59 5a 5b 5c 5d 5e 5f   PQRSTUVWXYZ[\]^_
0060  60 61 62 63 64 65 66 67 68 69 6a 6b 6c 6d 6e 6f   `abcdefghijklmno
0070  70 71 72 73 74 75 76 77 78 79 7a 7b 7c 7d 7e 7f   pqrstuvwxyz{|}~.
0080  80 81 82 83 84 85 86 87 88 89 8a 8b 8c 8d 8e 8f   ................
0090  90 91 92 93 94 95 96 97 98 99 9a 9b 9c 9d 9e 9f   ................
00a0  a0 a1 a2 a3 a4 a5 a6 a7 a8 a9 aa ab ac ad ae af   ................
00b0  b0 b1 b2 b3 b4 b5 b6 b7 b8 b9 ba bb bc bd be bf   ................
00c0  c0 c1 c2 c3 c4 c5 c6 c7 c8 c9 ca cb cc cd ce cf   ................
00d0  d0 d1                                             ..
    Data: 000102030405060708090a0b0c0d0e0f1011121314151617...
    [Length: 210]

Frame 2: 256 bytes on wire (2048 bits), 256 bytes captured (2048 bits)
    Arrival Time: Mar 21, 2012 14:35:10.111993000 PDT
```

show mvr

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

show mvr

Syntax Description   This command has no arguments or keywords.

Command Modes   Privileged EXEC

Command History

Release	Modification
Release IOS XE 3.5.0E and IOS 15.2(1)E	This command was introduced on the Catalyst 4500 series switch.

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

```
Switch# show mvr
MVR Running: TRUE
MVR multicast VLAN: 1
MVR Max Multicast Groups: 1500
MVR Current multicast groups: 0
MVR Global query response time: 5 (tenths of sec)
MVR Mode: compatible
```

In the preceding display, the maximum number of multicast groups is fixed at 500. The MVR mode is either compatible or dynamic.

Related Commands

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

show mvr interface

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

> **show mvr interface** [*interface-id* [**members** [**vlan** *vlan-id*]]]

Syntax Description

interface-id	(Optional) Specifies the MVR type, status, and Immediate Leave setting for the interface.
	Valid interfaces include physical ports (including type, module, and port number).
members	(Optional) Displays all MVR groups to which the specified interface belongs.
vlan *vlan-id*	(Optional) Displays all MVR group members on this VLAN. The VLAN ID range is 1 to 1001 and 1006 to 4094.

Command Default

Output shows all MVR-enabled ports on the switch

Command Modes

Privileged EXEC

Command History

Release	Modification
Release IOS XE 3.5.0E and IOS 15.2(1)E	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines

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

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

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

Examples

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

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

```
Fa0/3  Receiver        Trunk          3000    ACTIVE/UP      DISABLED
Fa0/10 Source          Access         10      ACTIVE/UP      DISABLED
```

In the preceding display, Status is defined as follows:

- Active means that the port is part of a VLAN.

- Up/Down means that the port is forwarding or nonforwarding.

- Inactive means that the port is not yet part of any VLAN.

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

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

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

```
Switch# show mvr interface fastethernet1/0/6 members
239.255.0.0    DYNAMIC ACTIVE
239.255.0.1    DYNAMIC ACTIVE
239.255.0.2    DYNAMIC ACTIVE
239.255.0.3    DYNAMIC ACTIVE
239.255.0.4    DYNAMIC ACTIVE
239.255.0.5    DYNAMIC ACTIVE
239.255.0.6    DYNAMIC ACTIVE
239.255.0.7    DYNAMIC ACTIVE
239.255.0.8    DYNAMIC ACTIVE
239.255.0.9    DYNAMIC ACTIVE
```

	Command	Description
Related Commands	**mvr (global configuration)**	Enables and configures multicast VLAN registration on the switch.
	mvr (interface configuration)	Configures MVR ports.
	show mvr	Displays the global MVR configuration on the switch.
	show mvr members	Displays all receiver ports that are members of an MVR multicast group.

show mvr members

To display all receiver and source ports that are currently members of an IP multicast group, use the **show mvr members** privileged EXEC command.

show mvr members [*ip-address*]

Syntax Description

ip-address	(Optional) Specifies the IP multicast address.
	If the address is entered, all receiver and source ports that are members of the multicast group are displayed.
	If no address is entered, all members of all Multicast VLAN Registration (MVR) groups are listed.
	If a group has no members, the group is listed as Inactive.

Command Default Displays all the static and dynamic MVR members on the switch

Command Modes Privileged EXEC

Command History

Release	Modification
Release IOS XE 3.5.0E and IOS 15.2(1)E	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines The **show mvr members** command applies to receiver and source ports. For MVR compatible mode, all source ports are members of all multicast groups.

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

```
Switch# show mvr members
MVR Group     Status   Members   VLAN   Membership
-----------   ------   -------   ----   ----------
239.1.1.1     ACTIVE   Fa0/1     1      Static
239.1.1.1     ACTIVE   Fa0/1     2000   Static
239.1.1.1     ACTIVE   Fa0/2     2      Static
239.1.1.1     ACTIVE   Fa0/2     3000   Static
239.1.1.2     ACTIVE   Fa0/1     1      Static
239.1.1.2     ACTIVE   Fa0/2     2      Static

<output truncated>

239.255.0.255   INACTIVE        None
239.255.1.0     INACTIVE        None
```

This is an example of output from the **show mvr members** *ip-address* command. It shows how to view the members of the IP multicast group 239.255.0.2.

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

Related Commands	Command	Description
	mvr (global configuration)	Enables and configures multicast VLAN registration on the switch.
	mvr (interface configuration)	Configures MVR ports.
	show mvr	Displays the global MVR configuration on the switch.
	show mvr interface	Displays the configured MVR interfaces, status of the specified interface, or all multicast groups to which the interface belongs when the **members** keyword is appended to the command.

show netflow-lite exporter

> ✎
>
> **Note**   NetFlow-lite is only supported on the Catalyst 4948E and Catalyst 4948E-F Ethernet switches.

To displays information about the collector and global stats, use the **show netflow-lite exporter** command.

show netflow-lite exporter *exporter-name*

Syntax Description

exporter-name	Specifies an exporter name.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
15.0(2)SG	Command introduced on the Catalyst 4500 series switch.

Usage Guidelines   This command displays the total number of export packets sent.

Examples   The following example shows how to display information about the collector and global stats:

```
Switch# show netflow-lite  exporter e1
Netflow-lite  Exporter e1:
  Description:              Exporter
  Network Protocol Configuration:
    Destination IP address:  192.168.1.1
    VRF label:               cisc
    Source IP Address:       10.1.1.5
    DSCP:                    0x1
    TTL:                     30
    COS:                     1
  Transport Protocol Configuration:
    Transport Protocol:     UDP
    Destination Port:       1234
    Source Port:            65535
  Export Protocol Configuration:
    Export Protocol:        netflow-v9
  Exporter Statistics:
    Export packets sent:    36
```

Related Commands	Command	Description
	destination (netflow-lite exporter submode)	
	vrf (netflow-lite exporter submode)	
	cos (netflow-lite exporter submode)	Specifies a cos value for the NetFlow-lite collector.
	source (netflow-lite exporter submode)	Specifies a source Layer 3 interface of the NetFlow-lite collector.
	transport udp (netflow-lite exporter submode)	Specifies a UDP transport destination port for a NetFlow-lite collector.
	ttl (netflow-lite exporter submode)	Specifies a ttl value for the NetFlow-lite collector.
	dscp (netflow-lite exporter submode)	Specifies a cos value for the NetFlow-lite collector.
	template data timeout (netflow-lite exporter submode)	Specifies a template data timeout for the NetFlow-lite collector.
	options timeout (netflow-lite exporter submode)	Specifies an options timeout for the NetFlow-lite collector.
	export-protocol (netflow-lite exporter submode)	Specifies the export protocol for the NetFlow-lite collector.

show netflow-lite monitor

✎

Note NetFlow-lite is only supported on the Catalyst 4948E and Catalyst 4948E-F Ethernet switches.

To display information about a particular packet or per data source stats, use the **show netflow-lite monitor** command.

show netflow-lite monitor *monitor-number* **interface** *interface-name*

show netflow-lite monitor *monitor-number* **vlan** *vlan-id*

Syntax Description

monitor-number	Specifies a monitor name.
interface-name	Specifies an interface.
vlan-id	Specifies a VLAN.

Command Default None

Command Modes Privileged EXEC mode

Command History

Release	Modification
15.0(2)SG	Command introduced on the Catalyst 4500 series switch.

Usage Guidelines This command displays information about a particular packet or per data source stats. The interface can be either a physical port or a VLAN.

This command displays the following packet sampling statistics:

- Total # of packet (samples) exported
- Total # of packet (samples) dropped due to lack of local resources
- Total# of packets seen at the data source

The *packetsObserved* statistic accounts for packets that are dropped by input ACL or QoS policer.

The exported packets only represent samples from the non-dropped packet population.

Examples These examples show how to display information about a particular packet or per data source stats:

```
Switch# show netflow-lite monitor 1 interface gi1/3
Interface GigabitEthernet1/3:
  Netflow-lite  Monitor-1:
    Active:             TRUE
    Sampler:            sampler1
    Exporter:           exporter1
    Average Packet Size: 0
```

```
Statistics:
  Packets exported:      0
  Packets observed:      0
  Packets dropped:       0
  Average Packet Size observed: 64
  Average Packet Size used: 64

Switch# show netflow-lite monitor 1 vlan 2
VlanID-2:
  Netflow-lite  Monitor-1:
    Active:              TRUE
    Sampler:             sampler1
    Exporter:            exporter1
    Average Packet Size: 0
  Statistics:
    Packets exported:      0
    Packets observed:      0
    Packets dropped:       0
    Average Packet Size observed: 64
    Average Packet Size used: 64
```

	Command	Description
Related Commands	sampler (netflow-lite monitor submode)	Activates sampling on an interface in netflow-lite monitor submode.
	exporter (netflow-lite monitor submode)	Assigns an exporter in netflow-lite monitor submode.
	average-packet-size (netflow-lite monitor submode)	Specifies the average packet size at the observation point.

show netflow-lite sampler

> **Note** NetFlow-lite is only supported on the Catalyst 4948E and Catalyst 4948E-F Ethernet switches.

To display information about a sampler, use the **show netflow-lite sampler** command.

show netflow-lite sampler *sampler-name*

Syntax Description

sampler-name	Specifies a sampler name.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
15.0(2)SG	Command introduced on the Catalyst 4500 series switch.

Examples

The following example shows how to display information about a sampler,:

```
Switch# show netflow-lite sampler low-rate
Netflow-lite Sampler low-rate:
  Description:        Sampler
  Sampling rate:      1 out of 256
  Packet Section Size:  64 bytes
  Packet offset:      0 bytes
```

Related Commands

Command	Description
packet-section size (netflow-lite sampler submode)	Specifies a sampled header size in netflow-lite submode.
packet-rate (netflow-lite sampler submode)	Specifies a packet sampling rate in netflow-lite sampler submode.
packet-offset (netflow-lite sampler submode)	Specifies a starting packet offset in netflow-lite submode.

show nmsp

To display the Network Mobility Services Protocol (NMSP) information for the switch, use the **show nmsp** command. This command is available only when your switch is running the cryptographic (encrypted) software image.

> **show nmsp** {**attachment suppress interface** | **capability** | **notification interval** | **statistics** {**connection** | **summary**} | **status** | **subscription** {**detail** | **summary**}}

Syntax Description

attachment suppress interface	Displays attachment suppress interfaces.
capability	Displays switch capabilities including the supported services and subservices.
notification interval	Displays the notification intervals of the supported services.
statistics connection | **summary**	Displays the NMSP statistics information. • **connection**—Displays the message counters on each connection. • **summary**—Displays the global counters.
status	Displays information about the NMSP connections.
subscription detail | **summary**	Displays the subscription information on each NMSP connection. • **detail**—Displays all services and subservices subscribed on each connection. • **summary**—Displays all services subscribed on each connection.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.2(52)SG	This command was introduced on the Catalyst 4500 series switch.

Examples   This is an example of output from the **show nmsp attachment suppress interface** command:

```
Switch# show nmsp attachment suppress interface
NMSP Attachment Suppression Interfaces
--------------------------------------
GigabitEthernet1/1
GigabitEthernet1/2
Switch#
```

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

```
Switch# show nmsp capability
NMSP Switch Capability
-----------------------
Service          Subservice
-----------      --------------
Attachment       Wired Station
Location         Subscription
Switch#
```

This is an example of output from the **show nmsp notification interval** command:

```
Switch# show nmsp notification interval
NMSP Notification Intervals
----------------------------------
Attachment notify interval: 30 sec (default)
Location notify interval: 30 sec (default)
Switch#
```

This is an example of output from the **show nmsp statistics connection** and **show nmsp statistics summary** commands:

```
Switch# show nmsp statistics connection
NMSP Connection Counters
-----------------------------------
Connection 1:
  Connection status: UP
  Freed connection: 0

  Tx message count          Rx message count
  ----------------------    ----------------------
  Subscr Resp: 1            Subscr Req: 1
  Capa Notif: 1             Capa Notif: 1
  Atta Resp: 1              Atta Req: 1
  Atta Notif: 0
  Loc Resp: 1               Loc Req: 1
  Loc Notif: 0

                            Unsupported msg: 0
Switch#
```

```
Switch# show nmsp statistics summary
NMSP Global Counters
-----------------------
  Send too big msg: 0
  Failed socket write: 0
  Partial socket write: 0
  Socket write would block: 0
  Partial socket write: 0
  Failed socket read: 0
  Socket read would block: 0
  Transmit Q full: 0
  Max Location Nofity Msg: 0
  Max Attachement Notify Msg: 0
  Max TX Q Size: 0
Switch#
```

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

```
Switch# show nmsp status
NMSP Status
---------------
NMSP: enabled

MSE IP Address    TxEchoResp RxEchoReq TxData RxData
--------------    ---------- --------- ------ ------
172.19.35.109      5          5         4      4
Switch#
```

This is an example of output from the **show nmsp show subscription detail** and **show nmsp show subscription summary** commands:

```
Switch# show nmsp subscription detail
Mobility Services Subscribed by 172.19.35.109:
Services       Subservices
------------   -------------------
Attachment:    Wired Station
Location:      Subscription

Switch# show nmsp subscription summary
Mobility Services Subscribed:
MSE IP Address     Services
--------------     --------
172.19.35.109      Attachment, Location
Switch#
```

	Command	Description
Related Commands	**clear nmsp statistics**	Clears the NMSP statistic counters.
	nmsp	Configures Network Mobility Services Protocol (NMSP) on the switch.

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following example shows how to display information about the PAgP counter:

```
Switch# show pagp counters
          Information      Flush
Port      Sent  Recv    Sent  Recv
-------------------------------------
Channel group: 1
  Fa5/4   2660  2452    0     0
  Fa5/5   2676  2453    0     0
Channel group: 2
  Fa5/6   289   261     0     0
  Fa5/7   290   261     0     0
Switch#
```

The following example shows how to display PAgP dual-active information:

```
Switch# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
```

```
Channel group 30
Dual-Active Partner Partner Partner
Port Detect Capable Name Port Version
Te3/1 Yes VS1-Reg2 Te1/1/7 1.1
Te4/1 Yes VS1-Reg2 Te2/2/8 1.1

Channel group 32
Dual-Active Partner Partner Partner
Port Detect Capable Name Port Version
Gi1/43 Yes VS3 Gi1/1/43 1.1
Gi1/44 Yes VS3 Gi1/1/44 1.1
Gi1/45 Yes VS3 Gi1/1/45 1.1
Gi1/46 Yes VS3 Gi2/1/46 1.1
Gi1/47 Yes VS3 Gi2/1/47 1.1
Gi1/48 Yes VS3 Gi2/1/48 1.1
Gi2/3 Yes VS3 Gi1/1/1 1.1
Gi2/4 Yes VS3 Gi2/1/1 1.1
Switch#
```

The following 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#
```

The following 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#
```

Related Commands

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

show pagp dual-active (virtual switch)

To display dual-active detection information, use the **show pagp dual-active** command in EXEC mode.

show pagp [*group-number*] **dual-active**

Syntax Description

group-number	(Optional) Channel-group number. Range: 1 to 256 with a maximum of 64 values.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(52)SG	This command was introduced on the Catalyst 4500 series switch.

Examples

The following example shows how to display dual-active detection information:

```
Router# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
Channel group 1
Dual-Active trusted group: Yes
Channel group 2
Dual-Active trusted group: Yes
Channel group 3 dual-active detect capability w/nbrs
Dual-Active trusted group: No
          Dual-Active    Partner            Partner   Partner
Port      Detect Capable Name               Port      Version
Fa1/2/33  No             None               None      N/A
Router#
```

The following example shows how to display dual-active detection information for a specific port channel:

```
Router# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
Channel group 3 dual-active detect capability w/nbrs Dual-Active trusted group: No
          Dual-Active    Partner            Partner   Partner
Port      Detect Capable Name               Port      Version
Fa1/2/33  No             None               None      N/A
Channel group 4
Dual-Active trusted group: Yes
No interfaces configured in the channel group
Channel group 5
Dual-Active trusted group: Yes
Channel group 5 is not participating in PAGP
Channel group 10 dual-active detect capability w/nbrs Dual-Active trusted group: Yes
          Dual-Active    Partner            Partner   Partner
Port      Detect Capable Name               Port      Version
Gi1/6/1   Yes            mr-rogers-nbr      Gi1/5/1   1.1
```

```
Gi2/5/1   Yes             mr-rogers-nbr       Gi1/5/2   1.1
Channel group 11 dual-active detect capability w/nbrs Dual-Active trusted group: No
          Dual-Active     Partner             Partner   Partner
Port      Detect Capable  Name                Port      Version
Gi1/6/2   Yes             mr-rogers-nbr       Gi1/3/1   1.1
Gi2/5/2   Yes             mr-rogers-nbr       Gi1/3/2   1.1
Channel group 12 dual-active detect capability w/nbrs Dual-Active trusted group: Yes
          Dual-Active     Partner             Partner   Partner
Port      Detect Capable  Name                Port      Version
Fa1/2/13  Yes             mr-rogers-nbr       Fa1/2/13  1.1
Fa1/2/14  Yes             mr-rogers-nbr       Fa1/2/14  1.1
Gi2/1/15  Yes             mr-rogers-nbr       Fa1/2/15  1.1
Gi2/1/16  Yes             mr-rogers-nbr       Fa1/2/16  1.1
Router#
```

The following example shows how to display dual-active detection information for a specific port channel:

```
Router# show pagp dual-active
PAgP dual-active detection enabled: Yes
PAgP dual-active version: 1.1
Channel group 3 dual-active detect capability w/nbrs
Dual-Active trusted group: No
          Dual-Active     Partner             Partner   Partner
Port      Detect Capable  Name                Port      Version
Fa1/2/33  No              None                None      N/A
Router#
```

Related Commands	Command	Description
	dual-active detection (virtual switch)	Enables and configures dual-active detection.

show policy-map

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

> **show policy-map** [*policy_map_name*]

Syntax Description

policy_map_name	(Optional) Name of the policy map.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

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

Examples

The following 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#
```

The following example shows how to display information for a specific policy map:

```
Switch# show policy ipp5-policy
Policy Map ipp5-policy
  class  ipp5
   set ip precedence 6
Switch#
```

Related Commands

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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

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

Usage Guidelines

This command is not supported on Supervisor Engine 6-E, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F.

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

The following 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 2-38 describes the fields shown in the display.

```
Switch# show policy-map control-plane

Control Plane

  Service-policy input: system-cpp-policy

    Class-map: system-cpp-eapol (match-all)
      0 packets
      Match: access-group name system-cpp-eapol

    Class-map: system-cpp-bpdu-range (match-all)
      0 packets
      Match: access-group name system-cpp-bpdu-range

    Class-map: system-cpp-cdp (match-all)
      28 packets
      Match: access-group name system-cpp-cdp
      police: Per-interface
        Conform: 530 bytes Exceed: 0 bytes
```

```
                    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 2-38   show policy-map control-plane Field Descriptions

Field	Description
Fields Associated with Classes or Service Policies	
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	**police** 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.

Related Commands	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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following 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#
```

The following 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.

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

```
Switch# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# class-map c1
Switch(config-cmap)# match flow ip source-address ip destination-address ip protocol l4
source-port l4 destination-port
Switch(config-cmap)# exit
Switch(config)# policy-map p1
Switch(config-pmap)# class c1
Switch(config-pmap-c)# police 1000000 9000
Switch(config-pmap-c)# exit
Switch(config-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 l4 source-port l4
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 l4 source-port l4
destination-port
      police: Per-interface
        Conform: 64995654 bytes Exceed: 2376965424 bytes


    Class-map: class-default (match-any)
      0 packets
      Match: any
        0 packets
Switch#
```

Related Commands

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	This command was introduced on the Catalyst 4500 series switch.

Examples   The following example show a configuration on a non-Supervisor Engine 6-E:

```
interface GigabitEthernet3/1
 vlan-range 20,400
  service-policy input p1
 vlan-range 300-301
  service-policy output p2
```

The following 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#
```

The following example shows a configuration on a non-Supervisor Engine 6-E:

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

The following example shows how to display policy-map statistics on VLAN 100 on the FastEthernet interface:

```
Switch# show policy-map interface fastEthernet 6/1 vlan 100

  FastEthernet6/1 vlan 100

  Service-policy input: p1
```

```
        Class-map: c1 (match-all)
          0 packets
          Match: ip dscp af11 (10)
          police: Per-interface
            Conform: 0 bytes Exceed: 0 bytes

        Class-map: class-default (match-any)
          0 packets
          Match: any
            0 packets
Switch#
```

The following example shows a configuration on a Supervisor Engine 6-E:

```
interface gigabitethernet3/1
 vlan-range 100
  service-policy in p1
```

The following example shows how to display policy-map statistics on VLAN 100 on the FastEthernet interface:

```
Switch# show policy-map interface gigabitethernet 3/1 vlan 100
GigabitEthernet3/1 vlan 100

  Service-policy input: p1

    Class-map: c1 (match-all)
      0 packets
      Match: ip dscp af11 (10)
      police:
          rate 128000 bps, burst 4000 bytes
          conformed 0 packets, 0 bytes; action:
            transmit
          exceeded 0 packets, 0 bytes; action:
            drop
          conformed 0 bps, exceeded 0 bps

    Class-map: class-default (match-any)
      0 packets
      Match: any
        0 packets
Switch#
```

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	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   The following example shows how to display port security settings for the entire switch:

```
Switch# show port-security
Secure Port  MaxSecureAddr  CurrentAddr  SecurityViolation  Security Action
             (Count)        (Count)      (Count)
-----------------------------------------------------------------------------
     Fa3/1            2            2                  0      Restrict
     Fa3/2            2            2                  0      Restrict
     Fa3/3            2            2                  0      Shutdown
     Fa3/4            2            2                  0      Shutdown
     Fa3/5            2            2                  0      Shutdown
     Fa3/6            2            2                  0      Shutdown
     Fa3/7            2            2                  0      Shutdown
     Fa3/8            2            2                  0      Shutdown
    Fa3/10            1            0                  0      Shutdown
    Fa3/11            1            0                  0      Shutdown
    Fa3/12            1            0                  0      Restrict
    Fa3/13            1            0                  0      Shutdown
    Fa3/14            1            0                  0      Shutdown
    Fa3/15            1            0                  0      Shutdown
    Fa3/16            1            0                  0      Shutdown
       Po2            3            1                  0      Shutdown
-----------------------------------------------------------------------------
Total Addresses in System (excluding one mac per port)     :8
Max Addresses limit in System (excluding one mac per port) :3072
Global SNMP trap control for port-security                 :20 (traps per second)
Switch#
```

The following example shows how to display port security settings for interface Fast Ethernet port 1:

```
Switch# show port-security interface fastethernet 5/1
Port Security              : Enabled
Port Status                : Secure-up
Violation Mode             : Shutdown
Aging Time                 : 0 mins
Aging Type                 : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses      : 1
Total MAC Addresses        : 1
Configured MAC Addresses   : 0
Sticky MAC Addresses       : 1
Last Source Address        : 0000.0001.001a
Security Violation Count   : 0
Switch#
```

The following 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    Type               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
```

The following example shows how to display the maximum allowed number of secure MAC addresses and the current number of secure MAC addresses on interface Gigabitethernet1/1:

```
Switch# show port-security interface gigabitethernet1/1 vlan
Default maximum: 22
VLAN  Maximum    Current
   2        22          3
   3        22          3
   4        22          3
   5        22          1
   6        22          2
```

The following 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
```

The following 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      Type                 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
```

The following 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      Type                 Ports    Remaining Age(mins)
----    -----------      ----                 -----    -------------
   2    0001.0001.0001   SecureConfigured     Gi1/1      -
   2    0001.0001.0002   SecureSticky         Gi1/1      -
```

```
2       0001.0001.0003     SecureSticky             Gi1/1       -
3       0001.0001.0001     SecureConfigured         Gi1/1       -
3       0001.0001.0002     SecureSticky             Gi1/1       -
3       0001.0001.0003     SecureSticky             Gi1/1       -
--------------------------------------------------------------------------
Total Addresses: 12
Switch#
```

The following example shows how to display the maximum allowed number of secure MAC addresses and the current number of secure MAC addressees on Fast Ethernet port 1:

```
Switch# show port-security interface fastethernet5/1 vlan
Default maximum: 22
VLAN   Maximum     Current
2          22          3
3          22          3
5          22          1
6          22          2
Switch#
```

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

```
Switch# show port-security interface fastethernet5/1 vlan 2-3
Default maximum: 22
VLAN   Maximum     Current
   2        22          3
   3        22          3
Switch#
```

The following example shows how to display all secure MAC addresses configured on Fast Ethernet port 1 with aging information for each address.

```
Switch# show port-security interface fastethernet5/1 address

            Secure Mac Address Table
--------------------------------------------------------------------------
Vlan    Mac Address       Type                  Ports   Remaining Age(mins)
----    -----------       ----                  -----   -------------
   2    0001.0001.0001    SecureConfigured      Gi1/1       -
   2    0001.0001.0002    SecureSticky          Gi1/1       -
   2    0001.0001.0003    SecureSticky          Gi1/1       -
   3    0001.0001.0001    SecureConfigured      Gi1/1       -
   3    0001.0001.0002    SecureSticky          Gi1/1       -
   3    0001.0001.0003    SecureSticky          Gi1/1       -
   4    0001.0001.0001    SecureConfigured      Gi1/1       -
   4    0001.0001.0002    SecureSticky          Gi1/1       -
   4    0001.0001.0003    SecureSticky          Gi1/1       -
   5    0001.0001.0001    SecureConfigured      Gi1/1       -
   6    0001.0001.0001    SecureConfigured      Gi1/1       -
   6    0001.0001.0002    SecureConfigured      Gi1/1       -
--------------------------------------------------------------------------
Total Addresses: 12
Switch#
```

The following example shows how to display all secure MAC addresses configured on VLANs 2 and 3 on
Fast Ethernet port 1 with aging information for each address:

```
Switch# show port-security interface fastethernet5/1 address vlan 2-3

            Secure Mac Address Table
--------------------------------------------------------------------------
Vlan    Mac Address       Type                  Ports   Remaining Age(mins)
```

```
  ----      ----------      ----                       -----   -------------
    2       0001.0001.0001    SecureConfigured        Gi1/1      -
    2       0001.0001.0002    SecureSticky            Gi1/1      -
    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#
```

The following 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       Type               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#
```

The following example shows how to display the maximum allowed number of secure MAC addresses and the current number of secure MAC addresses on interface Gigabitethernet1/1:

```
Switch# show port-security interface gigabitethernet1/1 vlan
Default maximum: 22
VLAN   Maximum     Current
    2         22          3
    3         22          3
    4         22          3
    5         22          1
    6         22          2
Switch#
```

The following 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
Switch#
```

The following 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       Type                    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#
```

The following 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       Type                    Ports   Remaining Age(mins)
----    -----------       ----                    -----   -------------
   2    0001.0001.0001    SecureConfigured        Gi1/1    -
   2    0001.0001.0002    SecureSticky            Gi1/1    -
   2    0001.0001.0003    SecureSticky            Gi1/1    -
   3    0001.0001.0001    SecureConfigured        Gi1/1    -
   3    0001.0001.0002    SecureSticky            Gi1/1    -
   3    0001.0001.0003    SecureSticky            Gi1/1    -
-------------------------------------------------------------------------
Total Addresses: 12
Switch#
```

Related Commands	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*] **detail** | **consumption default** | **module** *mod* **detail**}} | **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 **detail**	(Optional) Detailed information on the PoE status for the interface
consumption default	(Optional) Displays the PoE consumption.
module *mod* **default**	(Optional) Displays the PoE consumption for the specified module.
status	(Optional) Displays the power supply status.
supplies	(Optional) Displays the number of power supplies needed by the system.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
12.2(52)SG	Support to display detailed PoE consumption information on an interface/module.

Usage Guidelines If a powered device is connected to an interface with external power, the switch does not recognize the powered device. The Device column in the output of the **show power inline** command displays as unknown.

If your port is not capable of supporting PoE, you will receive this message:

```
Power over Ethernet not supported on interface Admin
```

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

Because FPGAs and other hardware components on the WS-X4548-RJ45V+ and WS-X4648-RJ45V+E modules consume PoE, the operating PoE consumption for an 802.3af-compliant module can be nonzero when there are no powered devices attached to the module. The operating PoE can vary by as much as 20 W because of fluctuations in the PoE that is consumed by the hardware components.

Examples The following 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                    Maximum
 (in Watts)            Used    Available
---------------------  ----    ---------
System Power (12V)      328       1360
Inline Power (-50V)       0       1400
Backplane Power (3.3V)   10         40
---------------------  ----
Total Used              338 (not to exceed Total Maximum Available = 750)
Switch#
```

The following 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#
```

Note The "Inline Power Oper" column displays the PoE consumed by the powered devices attached to the module in addition to the PoE consumed by the FPGAs and other hardware components on the module. The "Inline Power Admin" column displays only the PoE allocated by the powered devices attached to the module.

The following example shows how to display the power status information:

```
Switch# show power status
Power                                        Fan     Inline
Supply  Model No          Type      Status   Sensor  Status
------  ----------------  --------- ---------  ------  ------
PS1     PWR-C45-2800AC    AC 2800W  good      good    good
PS2     PWR-C45-2800AC    AC 2800W  good      good    good

Power Supply    Max     Min     Max     Min     Absolute
(Nos in Watts)  Inline  Inline  System  System  Maximum
--------------  ------  ------  ------  ------  --------
PS1             1400    1400    1360    1360    2800
PS2             1400    1400    1360    1360    2800
Switch#
```

The following example shows how to verify the PoE consumption for the switch:

```
Switch# show power inline consumption default
Default PD consumption : 5000 mW
Switch#
```

The following 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          Power(Watts)   Device               Class
                               From PS    To Device
--------- ------ ----------- ---------- ---------- ------------------- -----
Fa3/1     auto   on           17.3       15.4       Ieee PD             0
Fa3/2     auto   on           4.5        4.0        Ieee PD             1
Fa3/3     auto   on           7.1        6.3        Cisco IP Phone 7960 0
Fa3/4     auto   on           7.1        6.3        Cisco IP Phone 7960 n/a
Fa3/5     auto   on           17.3       15.4       Ieee PD             0
Fa3/6     auto   on           17.3       15.4       Ieee PD             0
Fa3/7     auto   on           4.5        4.0        Ieee PD             1
Fa3/8     auto   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

Switch#
```

The following 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#
```

The following 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(Watts)   Device               Class
                               From PS    To Device
--------- ------ ----------- ---------- ---------- ------------------- -----

Fa3/1     auto   on           11.2       10.0       Ieee PD             0

Interface  AdminPowerMax   AdminConsumption
           (Watts)            (Watts)
---------- --------------- --------------------

Fa3/1              15.4                 10.0
Switch#
```

The output of the commands **show power detail** and **show power module** display the supervisor engine's variable power consumption and its inline power summary:

```
Switch# show power detail
sh power detail
Power                                      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
Module Inline Power Summary (Watts)
(12V -> -48V on board conversion)
--------------------------------
                        Maximum
Mod     Used       Available
---     ----       ---------
1         5           25
---     ----       ---------


                         Watts Used of System Power (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   -        -           -        -           -
---------------------   ----------------    ----------------    ----------
       Total              0        0           0        0


                         Watts used of Module Inline Power (12V -> -50V)
                         Inline Power Admin  Inline Power Oper
Mod    Model             PS      Device      PS      Device      Efficiency
----   ----------------  ----------------    ----------------    ----------
 1     WS-X4013+TS        6        5           3        3           90
---------------------   ----------------    ----------------    ----------


Switch# show power module
sh power module
                         Watts Used of System Power (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       -       -         -        -         -
---------------------  ----------------  ----------------  ----------
      Total                  0       0         0        0

                        Watts used of Module Inline Power (12V -> -50V)
                        Inline Power Admin  Inline Power Oper
Mod   Model               PS     Device     PS     Device    Efficiency
----  ----------------  ----------------  ----------------  ----------
 1    WS-X4013+TS            6       5         3        3        90
---------------------  ----------------  ----------------  ----------

Switch#
```

The following example shows how to display detailed information on the PoE status for Gigabit interface 2/1:

```
Switch# show power inline g2/1 detail
Available:800(w)  Used:71(w)  Remaining:729(w)

 Interface: Gi2/1
 Inline Power Mode: auto
 Operational status: on
 Device Detected: yes
 Device Type: Cisco IP Phone 7970
 IEEE Class: 3
 Discovery mechanism used/configured: Ieee and Cisco
 Police: off

 Power Allocated
 Admin Value: 20.0
 Power drawn from the source: 11.0
 Power available to the device: 10.3

 Actual consumption
 Measured at the port: 5.0
 Maximum Power drawn by the device since powered on: 5.2

 Absent Counter: 0
 Over Current Counter: 0
 Short Current Counter: 0
 Invalid Signature Counter: 0
 Power Denied Counter: 0

Switch#
```

The following example shows how to display the PoE status for all all ports of the module:

```
Switch# show module
Chassis Type : WS-C4503-E

Power consumed by backplane : 0 Watts

Mod Ports Card Type                                Model              Serial No.
---+-----+--------------------------------------+------------------+----
 1    6  Sup 6-E 10GE (X2), 1000BaseX (SFP)      WS-X45-SUP6-E      JAE1132SXRP
 3   48  10/100/1000BaseT POE E Series           WS-X4648-RJ45V-E   JAE114740YF

 M MAC addresses                    Hw  Fw          Sw              Status
--+--------------------------------+---+-----------+---------------+--
 1 0017.94c8.f580 to 0017.94c8.f585 0.4 12.2(44r)SG( 12.2(52) Ok
```

```
          3 001e.7af1.f5d0 to 001e.7af1.f5ff 1.0                              Ok


Switch# show power inline module 3 detail
Available:800(w)  Used:0(w)  Remaining:800(w)

 Interface: Gi3/1
 Inline Power Mode: auto
 Operational status: off
 Device Detected: no
 Device Type: n/a
 IEEE Class: n/a
 Discovery mechanism used/configured: Ieee and Cisco
 Police: off

 Power Allocated
 Admin Value: 20.0
 Power drawn from the source: 0.0
 Power available to the device: 0.0

 Actual consumption
 Measured at the port: 0.0
 Maximum Power drawn by the device since powered on: 0.0

 Absent Counter: 0
 Over Current Counter: 0
 Short Current Counter: 0
 Invalid Signature Counter: 0
 Power Denied Counter: 0

 Interface: Gi3/2
 Inline Power Mode: auto
 Operational status: off
 Device Detected: no
 Device Type: n/a
 IEEE Class: n/a
 Discovery mechanism used/configured: Ieee and Cisco
 Police: off

 Power Allocated
 Admin Value: 20.0
 Power drawn from the source: 0.0
 Power available to the device: 0.0

 Actual consumption
 Measured at the port: 0.0
 Maximum Power drawn by the device since powered on: 0.0

 Absent Counter: 0
 Over Current Counter: 0
 Short Current Counter: 0
 Invalid Signature Counter: 0
 Power Denied Counter: 0

 Interface: Gi3/3
 Inline Power Mode: auto
 Operational status: off
 Device Detected: no
 Device Type: n/a
 IEEE Class: n/a
 Discovery mechanism used/configured: Ieee and Cisco
 Police: off

 Power Allocated
```

```
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/4
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/5
Inline Power Mode: auto
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0

Actual consumption
Measured at the port: 0.0
Maximum Power drawn by the device since powered on: 0.0

Absent Counter: 0
Over Current Counter: 0
Short Current Counter: 0
Invalid Signature Counter: 0
Power Denied Counter: 0

Interface: Gi3/6
Inline Power Mode: auto
```

```
Operational status: off
Device Detected: no
Device Type: n/a
IEEE Class: n/a
Discovery mechanism used/configured: Ieee and Cisco
Police: off

Power Allocated
Admin Value: 20.0
Power drawn from the source: 0.0
Power available to the device: 0.0
...............
```

Related Commands

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

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(50)SG	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

The following example shows how to display PoE policing status for a interface GigabitEthernet 2/1:

```
Switch# show power inline police gigabitEthernet 2/1
Available:421(w)  Used:44(w)  Remaining:377(w)

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

Related Commands

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following example shows how to display PPPoE Intermediate Agent configuration:

```
Switch# show pppoe intermediate-agent information
Switch PPPoE Intermediate-Agent is enabled
PPPoE Intermediate-Agent trust/rate is configured on the following Interfaces:
Interface               IA          Trusted    Vsa Strip    Rate limit (pps)
----------------------- --------    -------     ---------    ----------------
GigabitEthernet3/4        no          yes         yes          unlimited
PPPoE Intermediate-Agent is configured on following VLANs:
2-3
GigabitEthernet3/7        no          no          no           unlimited
PPPoE Intermediate-Agent is configured on following VLANs:
2-3
```

The following 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
```

	Command	Description
Related Commands	**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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Usage Guidelines   This command is not supported on Supervisor Engine 6-E, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F.

Examples   The following example shows the output that might be displayed if you do not enter any keywords:

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

Related Commands

Command	Description
qos account layer-all encapsulation	Globally enables QoS functionality on the switch.

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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

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

Usage Guidelines

This command is not supported on Supervisor Engine 6-E, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F.

The aggregate policer name is case sensitive.

Examples

The following example shows the output if you do not enter any keywords:

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

Related Commands

Command	Description
qos trust	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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Usage Guidelines   This command is not supported on Supervisor Engine 6-E, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F.

Examples   The following example shows how to display global DBL information:

```
Switch# show qos dbl
DBL is enabled globally
DBL flow includes vlan
DBL flow includes l4-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#
```

Related Commands

Command	Description
qos account layer-all encapsulation	Globally enables QoS functionality 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.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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 Supervisor Engine 6-E, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F.

Examples

The following 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    ShapeRate    Priority    QueueSize
                (bps)        (bps)                    (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#
```

Related Commands	Command	Description
	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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Usage Guidelines   This command is not supported on Supervisor Engine 6-E, Supervisor Engine 6L-E, Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F.

Examples   The following example shows how to display QoS map settings:

```
Switch# show qos maps
DSCP-TxQueue Mapping Table (dscp = d1d2)
d1 :d2  0   1   2   3   4   5   6   7   8   9
------------------------------------
 0 :    01  01  01  01  01  01  01  01  01  01
 1 :    01  01  01  01  01  01  02  02  02  02
 2 :    02  02  02  02  02  02  02  02  02  02
 3 :    02  02  03  03  03  03  03  03  03  03
 4 :    03  03  03  03  03  03  03  03  04  04
 5 :    04  04  04  04  04  04  04  04  04  04
 6 :    04  04  04  04

Policed DSCP Mapping Table (dscp = d1d2)
d1 :d2  0   1   2   3   4   5   6   7   8   9
------------------------------------
 0 :    00  01  02  03  04  05  06  07  08  09
 1 :    10  11  12  13  14  15  16  17  18  19
 2 :    20  21  22  23  24  25  26  27  28  29
 3 :    30  31  32  33  34  35  36  37  38  39
 4 :    40  41  42  43  44  45  46  47  48  49
 5 :    50  51  52  53  54  55  56  57  58  59
 6 :    60  61  62  63
```

```
DSCP-CoS Mapping Table (dscp = d1d2)
d1 :d2  0  1  2  3  4  5  6  7  8  9
-------------------------------------
 0 :    00 00 00 00 00 00 00 00 01 01
 1 :    01 01 01 01 01 01 02 02 02 02
 2 :    02 02 02 02 03 03 03 03 03 03
 3 :    03 03 04 04 04 04 04 04 04 04
 4 :    05 05 05 05 05 05 05 05 06 06
 5 :    06 06 06 06 06 06 07 07 07 07
 6 :    07 07 07 07

CoS-DSCP Mapping Table
   CoS:  0  1  2  3  4  5  6  7
--------------------------------
 DSCP:   0  8 16 24 32 40 48 56

Switch#
```

Related Commands	Command	Description
	qos account layer-all encapsulation	Globally enables QoS functionality on the switch.

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.	

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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#
```

The following example shows how to display redundancy facility client information:

```
Switch# show redundancy clients
clientID = 0        clientSeq = 0        RF_INTERNAL_MSG
clientID = 30       clientSeq = 135      Redundancy Mode RF
clientID = 28       clientSeq = 330      GALIOS_CONFIG_SYNC
clientID = 65000    clientSeq = 65000    RF_LAST_CLIENT Switch
```

The output displays the following information:

- clientID displays the client's ID number.

- clientSeq displays the client's notification sequence number.

- Current redundancy facility state.

The following 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#
```

The following example shows how to display redundancy facility history information:

```
Switch# show redundancy history
00:00:01 client added: RF_INTERNAL_MSG(0) seq=0
00:00:01 client added: RF_LAST_CLIENT(65000) seq=65000
00:00:01 client added: GALIOS_CONFIG_SYNC(28) seq=330
00:00:03 client added: Redundancy Mode RF(30) seq=135
00:00:03 *my state = INITIALIZATION(2) *peer state = DISABLED(1)
00:00:03 RF_PROG_INITIALIZATION(100) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:03 RF_PROG_INITIALIZATION(100) Redundancy Mode RF(30) op=0 rc=11
00:00:03 RF_PROG_INITIALIZATION(100) GALIOS_CONFIG_SYNC(28) op=0 rc=11
00:00:03 RF_PROG_INITIALIZATION(100) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:03 *my state = NEGOTIATION(3) peer state = DISABLED(1)
00:00:25 RF_EVENT_GO_ACTIVE(511) op=0
00:00:25 *my state = ACTIVE-FAST(9) peer state = DISABLED(1)
00:00:25 RF_STATUS_MAINTENANCE_ENABLE(403) Redundancy Mode RF(30) op=0
00:00:25 RF_STATUS_MAINTENANCE_ENABLE(403) GALIOS_CONFIG_SYNC(28) op=0
00:00:25 RF_PROG_ACTIVE_FAST(200) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_FAST(200) Redundancy Mode RF(30) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_FAST(200) GALIOS_CONFIG_SYNC(28) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_FAST(200) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:25 *my state = ACTIVE-DRAIN(10) peer state = DISABLED(1)
00:00:25 RF_PROG_ACTIVE_DRAIN(201) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_DRAIN(201) Redundancy Mode RF(30) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_DRAIN(201) GALIOS_CONFIG_SYNC(28) op=0 rc=11
00:00:25 RF_PROG_ACTIVE_DRAIN(201) RF_LAST_CLIENT(65000) op=0 rc=11
00:01:34 RF_PROG_PLATFORM_SYNC(300) RF_INTERNAL_MSG(0) op=0 rc=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#
```

The following 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#
```

Related Commands

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.

Command Default This command has no default settings.

Command Modes User EXEC mode

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.

> **Note**   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 prc
PRC Failed Command List
------------------------------
interface FastEthernet3/2
 ! <submode> "interface"
- channel-protocol pagp
 ! </submode> "interface"
```

Related Commands	Command	Description
	redundancy config-sync mismatched-commands	Moves the active supervisor engine into the Mismatched 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

module *slot*	(Optional) Specifies the module slot number; valid values are from 1 to 6.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following 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#
```

The following example shows the output for the **show running-config** command when you have enabled the **switchport voice vlan** command:

```
Switch# show running-config int fastethernet 6/1
Building configuration...

Current configuration:133 bytes
!
interface FastEthernet6/1
 switchport voice vlan 2
 no snmp trap link-status
 spanning-tree portfast
 channel-group 1 mode on
end

Switch#
```

show shell functions

Use the **show shell functions** command to display configurations for all builtin shell functions.

show shell functions

Syntax Description

No keywords

Command Default   None

Command Modes   Priviledged EXEC

Command History

Release	Modification
12.2(54)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines   This command only displays the contents of builtin shell functions. To display the contents of user created functions, use the **show shell triggers** command.

Examples   This example illustrates how to display configurations included for all the shell functions:

```
Switch# show shell functions
```

Related Commands

Command	Description
shell trigger	Creates a user defined trigger.
show shell triggers	Configures a user defined trigger.

show shell triggers

Use the **show shell triggers** command to display detail for all supported builtin and user created triggers.

show shell triggers

Syntax Description	**No keywords**

Command Default	None

Command Modes	Privileged EXEC

Command History

Release	Modification
12.2(54)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines This command displays builtin triggers and user defined triggers (with their mapped functions).

Examples This example illustrates how to display detail for all supported triggers:

```
Switch# show shell triggers
Trigger Id: testGroup
Trigger description: testGroup
Trigger environment:
Trigger mapping function:
```

Related Commands

Command	Description
shell trigger	Creates a user defined trigger.
show shell functions	Displays configurations included for all the builtin functions including user created and built-in functions.

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.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

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

Examples The following example shows how to display file system status information:

```
Switch# show slavebootflash: filesys

-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 0
DEVICE INFO BLOCK: bootflash
  Magic Number        = 6887635   File System Vers = 10000    (1.0)
  Length              = 1000000   Sector Size      = 40000
  Programming Algorithm = 39       Erased State     = FFFFFFFF
  File System Offset  = 40000     Length = F40000
  MONLIB Offset       = 100       Length = C628
  Bad Sector Map Offset = 3FFF8   Length = 8
  Squeeze Log Offset  = F80000    Length = 40000
  Squeeze Buffer Offset = FC0000  Length = 40000
  Num Spare Sectors   = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
  Bytes Used    = 917CE8  Bytes Available = 628318
  Bad Sectors   = 0       Spared Sectors  = 0
  OK Files      = 2       Bytes = 917BE8
  Deleted Files = 0       Bytes = 0
  Files w/Errors = 0      Bytes = 0
Switch>
```

The following 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>
```

The following example shows how to display all bootflash information:

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

6456088 bytes available (9534696 bytes used)

-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 0
DEVICE INFO BLOCK: bootflash
  Magic Number       = 6887635   File System Vers = 10000    (1.0)
  Length             = 1000000   Sector Size      = 40000
  Programming Algorithm = 39     Erased State     = FFFFFFFF
  File System Offset = 40000     Length = F40000
  MONLIB Offset      = 100       Length = C628
  Bad Sector Map Offset = 3FFF8  Length = 8
  Squeeze Log Offset   = F80000  Length = 40000
  Squeeze Buffer Offset = FC0000 Length = 40000
  Num Spare Sectors    = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
  Bytes Used     = 917CE8  Bytes Available = 628318
  Bad Sectors    = 0       Spared Sectors  = 0
  OK Files       = 2       Bytes = 917BE8
  Deleted Files  = 0       Bytes = 0
  Files w/Errors = 0       Bytes = 0
Switch>
```

show slaveslot0:

To display information about the file system on the standby supervisor engine, use the **show slaveslot0:** command.

show slot0: [all | chips | filesys]

all	(Optional) Displays all flash information including the output from the **show slot0: chips** and **show slot0: filesys** commands.
chips	(Optional) Displays flash chip register information.
filesys	(Optional) Displays file system status information.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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>
```

The following example shows how to display flash chip information:

```
Switch# show slaveslot0: chips
******** Intel Series 2+ Status/Register Dump ********
ATTRIBUTE MEMORY REGISTERS:
  Config Option Reg (4000): 2
  Config Status Reg (4002): 0
  Card Status   Reg (4100): 1
  Write Protect Reg (4104): 4
  Voltage Cntrl Reg (410C): 0
  Rdy/Busy Mode Reg (4140): 2

COMMON MEMORY REGISTERS: Bank 0
  Intelligent ID Code  : 8989A0A0
  Compatible Status Reg: 8080
  Global      Status Reg: B0B0
  Block Status Regs:
    0  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    8  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    16 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    24 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
```

```
COMMON MEMORY REGISTERS: Bank 1
  Intelligent ID Code  : 8989A0A0
  Compatible Status Reg: 8080
  Global    Status Reg: B0B0
  Block Status Regs:
    0  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    8  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    16 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    24 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0

COMMON MEMORY REGISTERS: Bank 2
  Intelligent ID Code  : 8989A0A0
  Compatible Status Reg: 8080
  Global    Status Reg: B0B0
  Block Status Regs:
    0  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    8  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    16 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    24 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0

COMMON MEMORY REGISTERS: Bank 3
  Intelligent ID Code  : 8989A0A0
  Compatible Status Reg: 8080
  Global    Status Reg: B0B0
  Block Status Regs:
    0  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    8  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    16 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    24 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0

COMMON MEMORY REGISTERS: Bank 4
  Intelligent ID Code  : FFFFFFFF
    IID Not Intel -- assuming bank not populated
```

The following example shows how to display file system information:

```
Switch# show slaveslot0: filesys
-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 0
DEVICE INFO BLOCK: slot0
  Magic Number       = 6887635   File System Vers = 10000    (1.0)
  Length             = 1000000   Sector Size      = 20000
  Programming Algorithm = 4      Erased State     = FFFFFFFF
  File System Offset = 20000     Length = FA0000
  MONLIB Offset      = 100       Length = F568
  Bad Sector Map Offset = 1FFF0  Length = 10
  Squeeze Log Offset = FC0000    Length = 20000
  Squeeze Buffer Offset = FE0000 Length = 20000
  Num Spare Sectors  = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
  Bytes Used    = 9F365C  Bytes Available = 5AC9A4
  Bad Sectors   = 0       Spared Sectors  = 0
  OK Files      = 1       Bytes = 9F35DC
  Deleted Files = 0       Bytes = 0
  Files w/Errors = 0      Bytes =
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 **show slot0: chips** and **show slot0: filesys** commands.
chips	(Optional) Displays flash chip register information.
filesys	(Optional) Displays file system status information.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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>
```

The following 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   B0B0
```

```
COMMON MEMORY REGISTERS: Bank 1
  Intelligent ID Code  : 8989A0A0
  Compatible Status Reg: 8080
  Global     Status Reg: B0B0
  Block Status Regs:
    0  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    8  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    16 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    24 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0

COMMON MEMORY REGISTERS: Bank 2
  Intelligent ID Code  : 8989A0A0
  Compatible Status Reg: 8080
  Global     Status Reg: B0B0
  Block Status Regs:
    0  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    8  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    16 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    24 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0

COMMON MEMORY REGISTERS: Bank 3
  Intelligent ID Code  : 8989A0A0
  Compatible Status Reg: 8080
  Global     Status Reg: B0B0
  Block Status Regs:
    0  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    8  :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    16 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0
    24 :  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0  B0B0

COMMON MEMORY REGISTERS: Bank 4
  Intelligent ID Code  : FFFFFFFF
    IID Not Intel -- assuming bank not populated
Switch>
```

The following example shows how to display file system information:

```
Switch# show slot0: filesys
-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 0
DEVICE INFO BLOCK: slot0
  Magic Number        = 6887635   File System Vers = 10000    (1.0)
  Length              = 1000000   Sector Size      = 20000
  Programming Algorithm = 4       Erased State     = FFFFFFFF
  File System Offset  = 20000     Length = FA0000
  MONLIB Offset       = 100       Length = F568
  Bad Sector Map Offset = 1FFF0   Length = 10
  Squeeze Log Offset  = FC0000    Length = 20000
  Squeeze Buffer Offset = FE0000  Length = 20000
  Num Spare Sectors   = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
  Bytes Used   = 9F365C  Bytes Available = 5AC9A4
  Bad Sectors  = 0       Spared Sectors  = 0
  OK Files     = 1       Bytes = 9F35DC
  Deleted Files = 0      Bytes = 0
  Files w/Errors = 0     Bytes = 0
Switch>
```

show spanning-tree

To display spanning-tree state information, use the **show spanning-tree** command.

show spanning-tree [*bridge_group* | **active** | **backbonefast** | **bridge** [*id*] | **inconsistentports** | **interface** *type* | **root** | **summary** [**total**] | **uplinkfast** | **vlan** *vlan_id* | **pathcost method** | **detail**]

Syntax Description

bridge_group	(Optional) Specifies the bridge group number; valid values are from 1 to 255.
active	(Optional) Displays the spanning-tree information on active interfaces only.
backbonefast	(Optional) Displays the spanning-tree BackboneFast status.
bridge	(Optional) Displays the bridge status and configuration information.
id	(Optional) Name of the bridge.
inconsistentports	(Optional) Displays the root inconsistency state.
interface *type*	(Optional) Specifies the interface type and number; valid values are **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **port-channel** (1 to 64), and **vlan** (1 to 4094).
root	(Optional) Displays the root bridge status and configuration.
summary	(Optional) Specifies a summary of port states.
total	(Optional) Displays the total lines of the spanning-tree state section.
uplinkfast	(Optional) Displays the spanning-tree UplinkFast status.
vlan *vlan_id*	(Optional) Specifies the VLAN ID; valid values are from 1 to 4094.
pathcost method	(Optional) Displays the default path cost calculation method used.
detail	(Optional) Displays a summary of interface information.

Command Default   Interface information summary is displayed.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	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   The following 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#
```

The following 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#
```

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

```
Switch# show spanning-tree bridge
VLAN1
  Bridge ID  Priority     32768
             Address      0050.3e8d.6401
             Hello Time    2 sec  Max Age 20 sec  Forward Delay 15 sec
VLAN2
  Bridge ID  Priority     32768
             Address      0050.3e8d.6402
             Hello Time    2 sec  Max Age 20 sec  Forward Delay 15 sec
VLAN3
  Bridge ID  Priority     32768
             Address      0050.3e8d.6403
             Hello Time    2 sec  Max Age 20 sec  Forward Delay 15 sec
Switch#
```

The following 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
                 Address     0030.94fc.0a00
                 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            Port ID
------------------      ------- --- ------ ---   ---- ------------------- -------
FastEthernet6/15        129.79  128     19 FWD      0 32768 0030.94fc.0a00 129.79


VLAN2
  Spanning tree enabled protocol ieee
  Root ID    Priority    32768
             Address     0030.94fc.0a01
             This bridge is the root
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32768
             Address     0030.94fc.0a01
             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            Port ID
------------------      ------- --- ------ ---   ---- ------------------- -------
FastEthernet6/16        129.80  128     19 FWD      0 32768 0030.94fc.0a01 129.80
Switch#
```

The following example shows how to display spanning-tree information for Fast Ethernet interface 5/9:

```
Switch# show spanning-tree interface fastethernet5/9
Interface Fa0/10 (port 23) in Spanning tree 1 is ROOT-INCONSISTENT
Port path cost 100, Port priority 128
Designated root has priority 8192, address 0090.0c71.a400
Designated bridge has priority 32768, address 00e0.1e9f.8940
Designated port is 23, path cost 115
Timers: message age 0, forward delay 0, hold 0
BPDU: sent 0, received 0
The port is in the portfast mode
Switch#
```

The following example shows how to display spanning-tree information for GigabitEthernet 3/13:

```
Switch# show spanning-tree interface gigabitethernet3/13 detail
Port 269 (GigabitEthernet3/13) of VLAN0002 is forwarding
   Port path cost 4, Port priority 128, Port Identifier 128.269.
   Designated root has priority 32770, address 0002.172c.f400
   Designated bridge has priority 32770, address 0002.172c.f400
   Designated port id is 128.269, designated path cost 0
   Timers: message age 0, forward delay 0, hold 0
   Number of transitions to forwarding state: 1
   Link type is point-to-point by default
   Loop guard is enabled by default on the port
   The port is in the portfast network mode by default
   BPDU: sent 2183, received 0
```

The following 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#
```

The following 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#
```

The following example shows how to display a summary of port states:

```
Switch# show spanning-tree summary
Switch is in rapid-pvst mode
Root bridge for: VLAN0199-VLAN0200, VLAN0128
EtherChannel misconfig guard is enabled
Extended system ID is enabled
Portfast Default is network
Portfast Edge BPDU Guard Default is disabled
Portfast Edge BPDU Filter Default is disabled
Loopguard Default is enabled
PVST Simulation Default is enabled but inactive in rapid-pvst mode
Bridge Assurance is enabled
UplinkFast is disabled
BackboneFast is disabled
Configured Pathcost method used is short

Name Blocking Listening Learning Forwarding STP Active
--------------------- -------- --------- -------- ---------- ----------
VLAN0199 0 0 0 5 5
VLAN0200 0 0 0 4 4
VLAN0128 0 0 0 4 4
--------------------- -------- --------- -------- ---------- ----------
3 vlans 0 0 0 13 13
```

The following 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                 Blocking Listening Learning Forwarding STP Active
```

```
                -------------------- -------- --------- -------- ---------- ----------
                          2 VLANs 0         0         0        2          2
Switch#
```

The following 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 inconsistent ports (segments) in the system:1
Switch#
```

Related Commands

Command	Description
spanning-tree backbonefast	Enables BackboneFast on a spanning-tree VLAN.
spanning-tree bridge assurance	Enables Bridge Assurance
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	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 **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **port-channel**, and **vlan**. See the "Usage Guidelines" section for more information.	

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(12c)EW	This command was introduced on the Catalyst 4500 series switch.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.

Usage Guidelines   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   The following example shows how to display region configuration information:

```
Switch# show spanning-tree mst configuration
Name      [leo]
Revision  2702
Instance  Vlans mapped
--------  ------------------------------------------------------------------------
0         1-9,11-19,21-29,31-39,41-4094
1         10,20,30,40
------------------------------------------------------------------------------------
Switch#
```

The following 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#
```

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

```
Switch# show spanning-tree mst 0 interface fastethernet4/1 detail
Edge port: no (trunk) port guard : none
(default)
Link type: point-to-point (point-to-point) bpdu filter: disable
(default)
Boundary : internal bpdu guard : disable
(default)
FastEthernet4/1 of MST00 is designated forwarding
Vlans mapped to MST00 1-2,4-2999,4000-4094
Port info port id 128.193 priority 128 cost
200000
Designated root address 0050.3e66.d000 priority 8193
cost 20004
Designated ist master address 0002.172c.f400 priority 49152
cost 0
Designated bridge address 0002.172c.f400 priority 49152 port id
128.193
Timers: message expires in 0 sec, forward delay 0, forward transitions 1
Bpdus sent 492, received 3
Switch#
```

	Command	Description
Related Commands	**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.

> **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 Default

This command has no default settings.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.1(19)EW	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:

```
Switch# show storm-control multicast //Supervisor Engine 6-E
Interface Filter State  Broadcast Multicast Level
--------- ------------- --------- --------- -----
Fa6/2     Blocking      Enabled   Enabled   61%
Switch#
```

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

```
Switch# show storm-control
Interface Filter State  Broadcast Multicast Level
--------- ------------- --------- --------- -----
Fa6/1     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# show storm-control fastethernet2/17
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# show storm-control interface fastethernet6/1
Interface  Filter State   Broadcast Multicast  Level
---------  -------------  -------   -------    -----
Fa6/1      Blocking       Enabled   Disabled   81%
Switch#
```

Table 2-39 describes the fields in the **show storm-control** display.

Table 2-39   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. **Note** N/A is displayed for interfaces that do storm control in the hardware.

Related Commands	**Command**	**Description**
	storm-control	Enables broadcast storm control on a port and specifies what to do when a storm occurs on a port.
	show interfaces counters	Displays the traffic on the physical interface.
	show running-config	Displays the running configuration of a switch.

show switch virtual (virtual switch)

To display configuration and status information for a virtual switching system (VSS), use the **show switch virtual** command in EXEC mode.

> **show switch virtual** [**dual-active** {**pagp** | **fast-hello** | **summary**} | **link** [**counters** | **detail** | **port-channel** | **ports**] | **redundancy** | **role** | **slot-map**]

Syntax Description

detail	(Optional) Displays detailed virtual switch information.
detail-active	(Optional) Displays virtual switch dual-active information.
pagp	Specifies a summary of dual-active PAgP information
fast-hello	Specifies a summary of dual-active fast-hello information,
summary	Specifies a summary of dual-active configuration information,
link	(Optional) Displays the virtual switch link information.
counters	(Optional) Displays VSL counter information
port-channel	(Optional) Displays VSL port channel information.
ports	(Optional) Displays VSL port information.
redundancy	(Optional) Displays the VSS redundancy status.
role	(Optional) Displays the VSS role information.
slot-map	(Optional) Displays the VSS slot map table.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.2(52)SG	This command was introduced on the Catalyst 4500 series switch.
Release IOS XE 3.5.0E and IOS 15.2(1)SG	This command was introduced.

Usage Guidelines   Use this command to display configuration and status information for a VSS.

The **show switch virtual link detail** command displays the output of the **show switch virtual link** commands and the **show vslp lmp internal** commands. In the output, the entry "show int" is displayed for all the VSL members.

The **show switch virtual dual-active pagp** command displays dual-active trust mode status.

Examples   The following example shows how to display configuration and status information for the VSS:

- In virtual switch mode without skipping config-register:

```
Router# show switch virtual

Switch mode : Virtual Switch
Virtual switch domain number : 1
Local switch number : 2
Local switch operational role: Virtual Switch Active
Peer switch number : 1
Peer switch operational role : Virtual Switch Standby
Router#
```

- In virtual switch mode with skipping config-register but not yet rebooted:

```
Router# show switch virtual

Switch mode : Virtual Switch
Virtual switch domain number : 1
Local switch number : 2
Local switch operational role: Virtual Switch Active
Peer switch number : 1
Peer switch operational role : Virtual Switch Standby
Warning: Config-register set or will be set to skip configuration 0x2142 in the next
reload.
Change config-register; otherwise, switch will be boot in Standalone mode with some
default config.
Router#
```

- In standalone mode without skipping config-register:

```
Router# show switch virtual
Switch Mode : Standalone
 Not in Virtual Switch mode due to:
   Domain ID is not configured
Router#
```

- In standalone mode with skipping config-register:

```
Router# show switch virtual
Switch Mode : Standalone
 Not in Virtual Switch mode due to:
   Domain ID is not configured
   Warning: config-register is set to skip parse 0x2142 in RP or SP
Use [show boot] on RP/SP to verify.
Router#
```

The following example shows how to display the virtual switch priority for local and peer switches:

```
Router# show switch virtual
Switch mode                 : Virtual Switch
Virtual switch domain number : 100
Local switch number         : 1
Local switch operational role: Virtual Switch Active
Peer switch number          : 2
Peer switch operational role : Virtual Switch Standby
Router#
```

The following example shows how to display the virtual switch link information:

```
Router# show switch virtual link
VSL Status           : UP
VSL Uptime           : 4 hours, 26 minutes
VSL SCP Ping         : Pass (or Fail)   OK (or Not OK)
```

```
VSL ICC (Ping)          : Pass (or Fail)
VSL Control Link        : Te1/3/1
Router#
```

The following example shows how to display the virtual switch link counter information:

```
Router# show switch virtual link counters
Port              InOctets    InUcastPkts   InMcastPkts   InBcastPkts
Po10              66340451        190415         15637        112069
Te1/3/1           66981250        194528         15770        112072
Po20              42116619         92926         16406        128593
Te2/2/1           42117401         92932         16406        128593


Port              OutOctets   OutUcastPkts  OutMcastPkts  OutBcastPkts
Po10              39030669        112680        105482             0
Te1/3/1           42133252        129182        108824             0
Po20              66948309        112069        210227             0
Te2/2/1           66957613        112070        210233             0


Port      Align-Err    FCS-Err    Xmit-Err    Rcv-Err UnderSize OutDiscards
Te1/3/1   0            0          0           0         0         0
Po10      0            0          0           0         0         0
Te1/3/1   0            0          0           0         0         0
Po20      0            0          0           0         0         0
Te2/3/1   0            0          0           0         0         0
Router#
```

The following example shows how to display the virtual switch link port-channel information:

```
Router# show switch virtual link port-channel

VSL Port Channel Information

Flags:  D - down        P - bundled in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      N - not in use, no aggregation
        f - failed to allocate aggregator

        M - not in use, no aggregation due to minimum links not met
        m - not in use, port not aggregated due to minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
```

The following example shows how to display the virtual switch link port information:

```
Router# show switch virtual link port

VSL Link Info          : Configured: 3   Operational: 1


                    Peer        Peer     Peer
Interface   State   MAC         Switch   Interface
-----------------------------------------------------------------------
 Gi1/3/1   link_down   -           -        -
 Gi1/5/4   operational 0013.5fcb.1480  2    Gi1/6/4
 Gi1/5/5   link_down   -           -        -


          Last operational        Current packet      Last Diag   Time since
Interface Failure state           State               Result      Last Diag
-----------------------------------------------------------------------
 Gi1/1/1  No failure              Hello bidir         Never ran   7M:51S
 Gi1/1/2  No failure              No failure          Never ran   7M:51S
```

```
                             Hello Tx (T4) ms       Hello Rx (T5*) ms
   Interface  State       Cfg    Cur    Rem    Cfg     Cur     Rem
   ----------------------------------------------------------------
   Te1/1/1    operational 500    500    404    5000    5000    4916
   Te1/1/2    link_down   500    -      -      500000  -       -
   Te1/3/3    link_down   500    -      -      500000  -       -
   Te1/3/4    operational 500    500    404    500000  500000  499916
   *T5 = min_rx * multiplier
Router#
```

The following example shows how to display redundancy status information for each switch in the virtual switch:

```
Router# show switch virtual redundancy
My Switch Id = 1
Peer Switch Id = 2
Last switchover reason = user forced
Configured Redundancy Mode = sso
Operating Redundancy Mode = sso
Switch 1 Slot 5 Processor Information :
-----------------------------------------------
Current Software state = ACTIVE
Uptime in current state = 9 hours, 32 minutes
Image Version = Cisco IOS Software, s72033_rp Software
(s72033_rp-ADVENTERPRISEK9_WAN_DBG-VM), Version 12.2(SIERRA_INTEG_090405) INTERIM SOFTWARE
Synced to V122_32_8_11, 12.2(32.8.11)SR on rainier, Weekly 12.2(32.8.11)SX261
Technical Support: http://www.cisco.com/techsupport
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Compiled Mon 06-Apr-09 02:54 by kchristi
BOOT = disk0:mz_good_image,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = ACTIVE
Control Plane State = ACTIVE
Switch 1 Slot 6 Processor Information :
-----------------------------------------------
Current Software state = RPR-Warm
Uptime in current state = 4 days, 17 hours, 36 minutes
Image Version =
BOOT = disk0:mz-rbh,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = RPR-Warm
Control Plane State = RPR-Warm
Switch 2 Slot 5 Processor Information :
-----------------------------------------------
Current Software state = STANDBY HOT (switchover target)
Uptime in current state = 9 hours, 24 minutes
Image Version = Cisco IOS Software, s72033_rp Software
(s72033_rp-ADVENTERPRISEK9_WAN_DBG-VM), Version 12.2(SIERRA_INTEG_090405) INTERIM SOFTWARE
Synced to V122_32_8_11, 12.2(32.8.11)SR on rainier, Weekly 12.2(32.8.11)SX261
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2009 by Cisco Systems, Inc.
Compiled Mon 06-Apr-09 02:54 by kchristi
BOOT = disk0:mz_good_image,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = ACTIVE
Control Plane State = STANDBY
```

```
Switch 2 Slot 6 Processor Information :
-----------------------------------------------
Current Software state = RPR-Warm
Uptime in current state = 4 days, 17 hours, 36 minutes
Image Version =
BOOT = disk0:mz-rbh,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = RPR-Warm
Control Plane State = RPR-Warm
Router#
```

The following example shows how to display role and configuration and status information for each switch in the virtual switch:

```
Router# show switch virtual role

Switch    Switch    Status  Preempt  Priority  Role     Session ID
          Number                                        Local Remote
-----------------------------------------------------------------------
Local     1    UP        TRUE     200       ACTIVE    0     0
Remote    2    UP        FALSE    100       STANDBY   9272  271

In dual-active recovery mode: No

Valid flag can be moved to detail
SID
```

The following example shows how to display the virtual switch slot map table:

```
Router# show switch virtual slot-map
Virtual Slot to Remote Switch/Physical Slot Mapping Table:

Virtual    Remote /    Physical    Module
Slot No    Switch No   Slot No     Uptime
---------+-----------+----------+----------
   17         1            1         03:04:51
   18         1            2         03:04:50
   19         1            3         03:00:25
   20         1            4         03:04:53
   21         1            5         03:04:59
   22         1            0         -
   23         1            0         -
   24         1            0         -
   25         1            0         -
   26         1            0         -
   27         1            0         -
   28         1            0         -
   29         1            0         -
   30         1            0         -
   31         1            0         -
   32         1            0         -
   33         2            1         02:59:25
   34         2            2         02:59:23
   35         2            3         02:59:23
   36         2            4         02:59:27
   37         2            5         03:03:17
   38         1            0         -
   39         1            0         -
   40         1            0         -
   41         1            0         -
   42         1            0         -
   43         1            0         -
```

```
44          1              0          -
45          1              0          -
46          1              0          -
47          1              0          -
48          1              0          -
49          1              0          -
Router#
```

The following example shows how to display virtual switch priority for local and peer switches:

```
Router# show switch virtual
Switch mode                : Virtual Switch
Virtual switch domain number : 100
Local switch number        : 1
Local switch operational role: Virtual Switch Active
Peer switch number         : 2
Peer switch operational role : Virtual Switch Standby
Router#
```

Related Commands

Command	Description
dual-active detection (virtual switch)	Enables and configures dual-active detection.
switch (virtual switch)	Configures the VSS domain number and enter the virtual switch domain configuration submode.

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following example shows how to display the global MTU setting:

```
Switch# show system mtu
Global Ethernet MTU is 1550 bytes.
Switch#
```

Related Commands

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.

Command Default 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	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 subcommand running under this command completes.

Press the **Return** key to display the next line of output, or press the **Space** bar to display the next page of information. If you do not enter the **page** keyword, the output scrolls. It does not stop for page breaks.

If you enter the **password** keyword, password encryption is enabled, but only the encrypted form appears in the output.

If you do not enter the **password** keyword, the passwords and other security-sensitive information in the output are replaced in the output with the word "removed."

The **show tech-support** commands are a compilation of several **show** commands and the output can be quite lengthy. For a sample display of the output of the **show tech-support** command, see the individual **show** command listed.

If you enter the **show tech-support** command without arguments, the output displays the equivalent of these **show** commands:

- **show version**
- **show running-config**
- **show stacks**

- **show interfaces**
- **show controllers**
- **show process memory**
- **show process cpu**
- **show buffers**
- **show logging**
- **show module**
- **show power**
- **show environment**
- **show interfaces switchport**
- **show interfaces trunk**
- **show vlan**

If you enter the **ipmulticast** keyword, the output displays the equivalent of these **show** commands:

- **show ip pim interface**
- **show ip pim interface count**
- **show ip pim neighbor**
- **show ip pim rp**
- **show ip igmp groups**
- **show ip igmp interface**
- **show ip mroute count**
- **show ip mroute**
- **show ip mcache**
- **show ip dvmrp route**

Examples   For a sample display of the **show tech-support** command output, see the commands listed in the "Usage Guidelines" section for more information.

Related Commands   See the "Usage Guidelines " section.

show udld

To display the administrative and operational UDLD status, use the **show udld** priviledged EXEC command.

show udld *interface-id* | **neighbors** | **fast-hello** {*interface id*}

Syntax Description

interface id	Specifies the administrative and operational UDLD status for a specific interface.
neighbors	Specifies the UDLD neighbor summary.
fast-hello	Specifies Fast UDLD neighbor summary and interface specific status.
interface-id	Specifies the name of the interface.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
12.2(25)EW	Added support for the 10-Gigabit Ethernet interface.
12.2(54)SG	Added support for **show udld fast-hello** and **show udld fast-hello** *interface id.*

Usage Guidelines   If you do not enter an *interface_id* value, the administrative and operational UDLD status for all interfaces is displayed.

Examples   To verify status for a particular link as reported by UDLD, enter the following command:

```
Switch# show udld g1/34
Interface Gi1/34
---
Port enable administrative configuration setting: Enabled / in aggressive mode
Port enable operational state: Enabled / in aggressive mode
Current bidirectional state: Bidirectional
Current operational state: Advertisement - Single neighbor detected
Message interval: 15000 ms
Time out interval: 5000 ms

Port fast-hello configuration setting: Disabled
Port fast-hello interval: 0 ms
Port fast-hello operational state: Disabled
Neighbor fast-hello configuration setting: Disabled
Neighbor fast-hello interval: Unknown


    Entry 1
    ---
```

```
            Expiration time: 43300 ms
            Cache Device index: 1
            Current neighbor state: Bidirectional
            Device ID: FOX10430380
            Port ID: Gi1/34
            Neighbor echo 1 device: FOX104303NL
            Neighbor echo 1 port: Gi1/34

            TLV Message interval: 15 sec
            No TLV fast-hello interval
            TLV Time out interval: 5
            TLV CDP Device name: Switch
```

To verify link status as reported by UDLD, enter the following command:

```
Switch# show udld neighbors

Port      Device Name   Device ID    Port ID     Neighbor State
----      -----------   ---------    -------     --------------
Gi1/33    FOX10430380   1            Gi1/33      Bidirectional
Gi1/34    FOX10430380   1            Gi1/34      Bidirectional
```

To verify Fast UDLD configuration, enter the following command:

```
Switch# show udld fast-hello
Total ports on which fast hello can be configured: 16
Total ports with fast hello configured: 3
Total ports with fast hello operational: 3
Total ports with fast hello non-operational: 0

Port-ID   Hello Neighbor-Hello Neighbor-Device Neighbor-Port Status
-------   ----- -------------- --------------- ------------- ------
Gi1/45    200   200            FOX104303NL     Gi1/45        Operational
Gi1/46    200   200            FOX104303NL     Gi1/46        Operational
Gi1/47    200   200            FOX104303NL     Gi1/47        Operational
```

To verify status for a particular link as reported by Fast UDLD, enter the following command:

```
Switch# show udld fast-hello g1/33

Interface Gi1/33
---
Port enable administrative configuration setting: Enabled / in aggressive mode
Port enable operational state: Enabled / in aggressive mode
Current bidirectional state: Bidirectional
Current operational state: Advertisement - Single neighbor detected
Message interval: 200 ms
Time out interval: 5000 ms

Port fast-hello configuration setting: Enabled
Port fast-hello interval: 200 ms
Port fast-hello operational state: Enabled
Neighbor fast-hello configuration setting: Enabled
Neighbor fast-hello interval: 200 ms

    Entry 1
    ---
    Expiration time: 500 ms
    Cache Device index: 1
    Current neighbor state: Bidirectional
    Device ID: FOX10430380
    Port ID: Gi1/33
    Neighbor echo 1 device: FOX104303NL
    Neighbor echo 1 port: Gi1/33
```

```
TLV Message interval: 15
TLV fast-hello interval: 200 ms
TLV Time out interval: 5
TLV CDP Device name: Switch
```

Related Commands	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 **udld (global configuration mode)** 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.	

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History	Release	Modification
	12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
	12.1(12c)EW	Added support for extended VLAN addresses.

Examples   The following 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...>
```

```
850  VLAN0850                         active   Fa5/9
917  VLAN0917                         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


VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
2    enet  100002     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...>

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 AREHops STEHops Backup CRF
---- ------- ------- ----------
802  0       0       off
1003 7       7       off
Switch#
```

The following example shows how to display the VLAN name, status, and associated ports only:

```
Switch# show vlan brief
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active   Fa5/9
2    VLAN0002                         active   Fa5/9
3    VLAN0003                         active   Fa5/9
4    VLAN0004                         active   Fa5/9
5    VLAN0005                         active   Fa5/9
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#
```

The following 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
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
3    enet  100003     1500  -      -      -        -    -        303    0
Switch#
```

Table 2-40 describes the fields in the **show vlan** command output.

Table 2-40   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
```

The following example shows how to remove the VLAN association:

```
Switch(config)# vlan 10
Switch(config-vlan)# private-vlan association remove 100
Switch(config-vlan)# end
Switch# show vlan private
Primary Secondary Type            Ports
------- --------- ---------------- -------------------------------------------
10                primary
        100       community
```

This example show how to verify PVLAN configuration on the interface:

```
Switch# show interface f3/2 status
Port      Name                Status      Vlan       Duplex  Speed Type
Fa3/2                         connected   pvlan 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#
```

Related Commands

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(12c)EW	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#
```

Related Commands

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 VLAN.

Command Default This command has no default settings.

Command Modes Privileged EXEC mode

Command History

Release	Modification
12.1(13)EW	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 The following example shows how to display the software-cached counter values for a specific VLAN:

```
Switch# show vlan counters
* Multicast counters include broadcast packets

Vlan Id                                      : 1
L2 Unicast Packets                           : 0
L2 Unicast Octets                            : 0
L3 Input Unicast Packets                     : 0
L3 Input Unicast Octets                      : 0
L3 Output Unicast Packets                    : 0
L3 Output Unicast Octets                     : 0
L3 Output Multicast Packets                  : 0
L3 Output Multicast Octets                   : 0
L3 Input Multicast Packets                   : 0
L3 Input Multicast Octets                    : 0
L2 Multicast Packets                         : 1
L2 Multicast Octets                          : 94
Switch>
```

Related Commands

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 Default This command has no default settings.

Command Modes User EXEC mode

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
```

Related Commands

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 group

To display the VLANs mapped to VLAN groups, use the **show vlan group** privildeged EXEC command.

> **show vlan group** [**group-name** *group-name*]

Syntax Description

group-name *group-name*	(Optional) Displays the VLANs mapped to the specified VLAN group.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(54)SG	This command was modified to support user distribution on the Catalyst 4500 series switch.

Usage Guidelines   The **show vlan group** command displays the existing VLAN groups and lists the VLANs and VLAN ranges that are members of each VLAN group. If you use the **group-name** keyword, you display only the members of the VLAN group specified by the *group-name* argument.

Examples   The following example shows how to display the members of a specified VLAN group:

```
Switch# show vlan group group-name ganymede

Group Name Vlans Mapped
--------------- -------------------
ganymede        7-9
```

Related Commands

Command	Description
vlan group	Creates or modifies a VLAN group.

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following example shows how to display information about the current internal VLAN allocation:

```
Switch# show vlan internal usage

VLAN Usage
---- --------------------
1025 -
1026 -
1027 -
1028 -
1029 Port-channel6
1030 GigabitEthernet1/2
1032 FastEthernet3/20
1033 FastEthernet3/21
1129 -
```

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

```
Switch# show vlan id 1030 internal usage

VLAN Usage
---- --------------------
1030 GigabitEthernet1/2
```

Related Commands

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

show vlan mapping

Use the **show vlan mapping** privileged EXEC command to display information about VLAN mapping on trunk ports.

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

Syntax Description

interface *interface-id*	(Optional) Displays VLAN mapping information for the specified interface.
| begin	(Optional) Displays begins with the line that matches the *expression*.
| exclude	(Optional) Displays excludes lines that match the *expression*.
| include	(Optional) Displays includes lines that match the specified *expression*.
expression	Specifies an expression in the output to use as a reference point.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
12.2(54)SG	This command was introduced on the Catalyst 4500 series switch.

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

Examples This is a sample output from the **show vlan mapping** command:

```
Switch# show vlan mapping
Interface Fa0/5:
VLANs on wire         Translated VLAN      Operation
------------------    ---------------      --------------
default QinQ              1                selective QinQ
Interface Fa0/2:
VLANs on wire         Translated VLAN      Operation
------------------    ---------------      --------------
2                        104              1-to-1 mapping
```

This is a sample output from the **show vlan mapping** command for an interface:

```
Switch# show vlan mapping interface fa0/6
Interface fa0/6:
VLAN on wire          Translated VLAN       Operation
1                        11               1-to-1 mapping
12,16-18                 100                 selective QinQ
*                        101                 default QinQ
```

Related Commands	Command	Description
	switchport vlan mapping	Configures VLAN mapping on an interface.

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

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Usage Guidelines   The MTU_Mismatch column in the command output indicates whether all the ports in the VLAN have the same MTU. When "yes" is displayed in the MTU_Mismatch column, it means that the VLAN has a port with different MTUs, and packets might be dropped that are switched from a port with a larger MTU to a port with a smaller MTU. If the VLAN does not have an SVI, the hyphen (-) symbol is displayed in the SVI_MTU column.

For a VLAN, if the MTU-Mismatch column displays "yes," the names of the port with the MinMTU and the port with the MaxMTU are displayed. For a VLAN, if the SVI_MTU is bigger than the MinMTU, "TooBig" is displayed after the SVI_MTU.

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

```
Switch# show vlan mtu

VLAN    SVI_MTU       MinMTU(port)   MaxMTU(port)   MTU_Mismatch
----  -------------  -------------  ------------  ------------
1    1500           1500           1500           No
Switch>
```

Related Commands

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, twoway-community nonoperational, and normal.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
12.2(20)EW	Support for community VLAN was added.
15.1.0 SG	Support for PVLAN modes over EtherChannel. Modes include: private-vlan host, private-vlan promiscuous, private-vlan trunk secondary, and private-vlan trunk promiscuous.

Usage Guidelines   When the **show vlan private-vlan type** command displays a VLAN type as normal, it indicates that a regular VLAN has been used in the private VLAN configuration. When normal is displayed, this indicates that two VLANs have been associated before the type was set, and the private VLAN is not operational. This information is useful for debugging purposes.

Examples   The following example shows how to display information about all currently configured private VLANs:

```
Switch# show vlan private-vlan

Primary Secondary Type             Ports
------- --------- ---------------- ----------------------------------------
2       301       community        Fa5/3, Fa5/25
2       302       community
2       303       community        Fa5/3, Po63
        10        community
100     101       isolated
150     151       non-operational
        202       community
        303       twoway-community
401     402       non-operational
Switch#
```

Note   A blank Primary value indicates that no association exists.

The following example shows how to display information about all currently configured private VLAN types:

```
Switch# show vlan private-vlan type

Vlan Type
---- -----------------
202  primary
303  community
304  community
305  community
306  community
307  community
308  normal
309  community
440  isolated
Switch#
```

Table 2-41 describes the fields in the **show vlan private-vlan** command output.

Table 2-41   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.
Type	Type of VLAN; possible values are **primary, isolated**, community, nonoperational, or **normal**.

Related Commands	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.

Command Default

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

The following example shows how to display a list of RSPAN VLANs:

```
Router# show vlan remote-span
Remote SPAN VLANs
-------------------------------------------------------------------------------
2,20
```

Related Commands

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 Description

statistics	(Optional) Displays the client-side statistics.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.1(13)EW	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#
```

Related Commands

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 vslp (virtual switch)

To display Virtual Switch Link Protocol (VSLP) instance information, use the **show vslp** command in EXEC mode.

show vslp {**lmp** | **rrp** [*type*]} | {**instances** | **lmp** [*type*] | **packet** [**counters**] | **rrp** [*type*]}

Syntax Description

lmp	Specifies the Link Maintenance Protocol (LMP) information.
rrp	Specifies the Role Resolution Protocol (RRP) information.
type	Specifies the type of information; see the "Usage Guidelines" section for valid values.
instances	Displays the VSLP instance mappings.
packet	Displays the VSLP packet information.
counters	(Optional) Displays the VSLP packet counter information.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

Release	Modification
12.2(52)SG	This command was introduced on the Catalyst 4500 series switch.

Usage Guidelines   The valid values for the *type* argument are as follows:

- **counters**—Displays counter information.
- **detail**—Displays detailed information.
- **fsm**—Displays Finite State Machine (FSM) information.
- **neighbors**—Displays neighbor information (supported with the *lmp* keyword only).
- **status**—Displays status information.
- **summary**—Displays a summary of information.
- **timer**—Displays Tx and Rx hello timer values.

The timers already displayed in the show vslp lmp timers output are shown in the output of the show vslp lmp summary command.

The output of the **show vslp rrp detail** command includes the information from the following commands:

- **show vslp rrp summary**
- **show vslp rrp counters**
- **show vslp rrp fsm**

Examples   The following example shows how to display a summary of LMP information for a specific VSLP instance.

```
Router# show vslp 2 lmp summary
  LMP summary
    Link info:        Configured: 2        Operational: 0
                                Peer Peer              Peer  Peer    Timer(s) running
Port    Flag State          Flag MAC              Swtch Port   (Time remaining)
-------------------------------------------------------------------------------------
 4/1   v   link_down       -    -                  -     -
 4/2   v   link_down       -    -                  -     -
Router#
```

The following example shows how to displays the VSLP instance mappings.

```
Router# show vslp instances
VSLP instance mappings:
Instance Num  Name                                   Switch Num    Flag
----------------------------------------------------------------------
2             VSL                                    2             0x00000001
Router#
```

The following example shows how to display LMP neighbor information:

```
Router# show vslp 2 lmp neighbors
  LMP neighbors
    Peer Group info:        # Groups: 0
Router#
```

The following example shows how to display a summary of LMP information:

```
Router# show vslp lmp summary
Instance #1:
LMP summary
Link info:        Configured: 3        Operational: 1
                                Peer Peer         Peer   Peer        Timer(s) running
 Interface Flag State          Flag MAC           Switch Interface   (Time remaining)
-------------------------------------------------------------------------------------
 Gi1/3/1    v   link_down       -    -              -      -
 Gi1/5/4    vf  operational     vf   0013.5fcb.1480 2      Gi1/6/4    T4(240ms) T5(2.22s)
 Gi1/5/5    v   link_down       -    -              -      -
Flags:  V - valid        f -> B - bidirectional
```

The following examples shows how to display the LMP Tx and Rx hello timer values:

```
Router# show vslp lmp timer
Instance #1:
  LMP hello timer
                          Hello Tx (T4) ms          Hello Rx (T5*) ms
Interface   State        Cfg    Cur   Rem          Cfg     Cur    Rem
-----------------------------------------------------------------------
Gi1/9/1     link_down    1000   -     -            500000  -      -
Gi1/9/3     link_down    1000   -     -            500000  -      -
Gi1/9/5     link_down    1000   -     -            500000  -      -
Router#
```

The following example shows how to display VSLP packet information:

```
Router# show vslp packet
VSLP packet counters
  Transmitted:
    total       = 1543
    error       = 0
    err_cksum   = 0
    eobc        = 0
```

```
    ibc         = 0
    eobc[LMP]   = 0
    eobc[RRP]   = 0
    eobc[PING]  = 0
  Received:
    total       = 1564
    error       = 0
    err_cksum   = 0
    eobc        = 1564
    ibc         = 0
    total[LMP]  = 0
    total[RRP]  = 0
    total[PING] = 0
    eobc[LMP]   = 1559
    eobc[RRP]   = 5
    eobc[PING]  = 0
Router#
```

The following example shows how to display VSLP packet counter information:

```
Router# show vslp packet counters
VSLP packet counters
  Transmitted:
    total       = 28738
    error       = 0
    err_cksum   = 0
    eobc           = 28738
      eobc[LMP]   = 28701
      eobc[RRP]   = 17
      eobc[PING]  = 20
    ibc            = 0
      ibc[LMP]     = 0
      ibc[RRP]     = 0
      ibc[PING]    = 0
  Received:
    total       = 28590
    error       = 0
    err_cksum   = 0
    eobc           = 28590
      eobc[LMP]   = 28552
      eobc[RRP]   = 18
      eobc[PING]  = 20
    ibc            = 0
      ibc[LMP]     = 0
      ibc[RRP]     = 0
      ibc[PING]    = 0
Router#
```

The following example shows how to display a summary of RRP information:

```
Router# show vslp rrp summary
RRP information for Instance 1
------------------------------
Valid  Flags   Peer      Preferred  Reserved
                Count     Peer       Peer
-------------------------------------------------
TRUE   V       1         1          1
Switch  Peer  Switch  Status  Preempt  Priority  Role     Local  Remote
        Group Number                                       SID    SID
----------------------------------------------------------------------
Local   0     1       UP      TRUE     200       ACTIVE   0      0
Remote  1     2       UP      FALSE    100       STANDBY  9272   271
Flags:  V - valid
```

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.

Command Default   This command has no default settings.

Command Modes   Privileged EXEC mode

Command History

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

Examples   The following 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#
```

The following 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 interfac
e found)
Switch#
```

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

```
Switch# show vtp counters | include Summary
Summary advertisements received    : 1
Summary advertisements transmitted : 32
Trunk           Join Transmitted Join Received    Summary advts received from
Switch#
```

Table 2-42 describes the fields in the **show vtp** command output.

Table 2-42   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.

Related Commands	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.