

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	<i>interface</i>	(Optional) Interface type; valid values are ethernet , fastethernet , gigabitethernet , tengigabitethernet , and port-channel .
	<i>interface-number</i>	(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		
<i>interface</i>	(Optional) Interface type; possible valid values are ethernet , fastethernet , gigabitethernet , tengigabitethernet , pos , ge-wan , and atm .	
<i>interface-number</i>	(Optional) Module and port number; see the “Usage Guidelines” section for valid values.	
null <i>interface-number</i>	(Optional) Specifies the null interface; the valid value is 0 .	
port-channel <i>number</i>	(Optional) Specifies the channel interface; valid values are a maximum of 64 values ranging from 1 to 256.	
vlan <i>vlan-id</i>	(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 <i>groupaddr</i>	(Optional) Specifies a multicast group address.
source <i>sourceaddr</i>	(Optional) Specifies a multicast source address.
interface <i>interfacename</i>	(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 <i>interface</i>	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 <i>session-id</i>	(Optional) Specifies an Auth Manager session.
handle <i>handle</i>	(Optional) Specifies the particular handle for which Auth Manager information is displayed. Range is 1 to 4294967295.
mac <i>mac</i>	(Optional) Displays Auth Manager session information for a specified MAC address.
method <i>method</i>	(Optional) Displays all clients authorized by a specified authentication method. Valid values are as follows: <ul style="list-style-type: none"> • dot1x • mab • webauth
interface <i>interface</i> details	(Optional) Displays detailed information.
interface <i>interface</i> 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 0908140400000007003651EC
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 <i>interface-id</i>	(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.
<i>expression</i>	(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	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>3.6.0E</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	3.6.0E	This command was introduced on the Catalyst 4500 series switch.
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 | fileys]

Syntax Description	all	(Optional) Displays all possible Flash information.
	chips	(Optional) Displays Flash chip information.
	fileys	(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: fileys

----- 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 switch 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 3-21 describes the fields in the **show cable-diagnostics tdr** command output.

Table 3-21 *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: <ul style="list-style-type: none"> 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

Switch#

```

Call Home Statistics

```

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

```

■ show call-home

```

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

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

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

```

Last call-home message sent time: n/a

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	
<i>type</i>	(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 .
<i>number</i>	(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 switch 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 3-22 describes the fields that are shown in the example.

Table 3-22 *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 3-23 describes the fields that are shown in the example.

Table 3-23 *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	<i>class_name</i> 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 14
source-port 14 destination-port
Switch(config-cmap)# exit
Switch(config)# policy-map p1
Switch(config-pmap)# class c1
Switch(config-pmap-c)# police 1000000 9000
Switch(config-pmap-c)# exit
Switch(config-pmap)# exit
Switch(config)# interface fastEthernet 6/1
Switch(config-if)# service-policy input p1
Switch(config-if)# end
Switch# write memory
Switch# show policy-map interface
FastEthernet6/1

class-map c1
  match flow ip source-address ip destination-address ip protocol 14 source-port 14
  destination-port
  !
  policy-map p1
    class c1
      police 1000000 bps 9000 byte conform-action transmit exceed-action drop
    !
  !
interface FastEthernet 6/1
  service-policy input p1

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

```

Related Commands

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
```

ID	Test Name	Attributes	Testing Interval (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

<i>slot-num</i>	(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.
<i>test-id</i>	(Optional) Specifies a single test ID.
<i>test-id-range</i>	(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		
<i>N</i>	(Optional)	Specifies the module number.
all	(Optional)	Specifies all modules.
test <i>test-id</i>	(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	<i>N</i>	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	<i>N</i>	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:

```

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 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 <i>interface-id</i>	(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

<i>plugin-name</i>	(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 Supply Model No      Type      Fan 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
Supply Model No          Type          Status      Fan
-----
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
```

show errdisable detect

```

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
pagg-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	
<i>channel-group</i>	(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:

Port      Flags State  Timers  Hello  Partner  PAgP    Learning  Group
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:

Port      Flags State  Timers  Hello  Partner  PAgP    Learning  Group
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

```

■ show etherchannel

```

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   Gchange = 0
Port-channel   = null        GC   = 0x00000000   Pseudo-agport = Po1
Port indx      = 0             Load = 0x00

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

<...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	<i>name</i>	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	Parameter	Description
	module <i>slot</i>	(Optional) Limits the display to interfaces on a specific module.
	interface <i>interface</i>	(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 3-25 describes the fields in the **show flowcontrol** command output.

Table 3-25 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
-----
Tel1/1    off    off         on     off         0        0
Tel1/2    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
-----
Tel1/1    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.
	<i>number</i>	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              Tel1/1-3   Gi1/7-12
1       2              Tel1/4-6   Gi1/13-18
Switch#
```

Related Commands

Command	Description
<code>hw-module port-group</code>	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.
<i>mod</i>	(Optional) Specifies the module name.
interface <i>int_name</i>	Displays information for the GBIC or SFP IDPROMs.
supervisor	Displays information for the supervisor engine IDPROMs.
power-supply <i>number</i>	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 = <tb>
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 measurement  = Optical Modulation Amplitude (OMA)
Address change       = Required
CC_EXT               = 0xB2

Vendor Specific ID Fields:
20944D30  29 00 02 80 22 33 38 3D C7 67 83 E8 DF 65 6A AF  )..."38=Gg^Ch_ej/
20944D40  1A 80 ED 00 00 00 00 00 00 00 00 00 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 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
  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 = 0x00000000FFFFFFF
  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 <i>mod/interface-number</i>	(Optional)	Specifies the Fast Ethernet module and interface.
gigabitethernet <i>mod/interface-number</i>	(Optional)	Specifies the Gigabit Ethernet module and interface.
tengigabitethernet <i>mod/interface-number</i>	(Optional)	Specifies the 10-Gigabit Ethernet module and interface.
null <i>interface-number</i>	(Optional)	Specifies the null interface; the valid value is 0.
vlan <i>vlan_id</i>	(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	
<i>interface</i>	(Optional) Specifies interface type
<i>switch-num</i>	Specifies port number.
<i>/mod</i>	Specifies module number
<i>/port</i>	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.

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 <i>mod</i>	(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	
<i>interface</i>	(Optional) Specifies the interface type.
<i>switch-num</i>	Specifies the switch number; valid values are 1 and 2.
<i>/mod</i>	Specifies the module number.
<i>/port</i>	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          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	<i>interface</i> (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
Gig1/1     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 <i>mod_num</i> (Optional) Limits the display to interfaces on a module.				
Command Default	This command has no default settings.				
Command Modes	Privileged EXEC mode				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.2(18)EW</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	12.2(18)EW	This command was introduced on the Catalyst 4500 series switch.
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     Gi1/1          00:00:00
Gi1/2     Gi1/2          00:00:00
Gi3/1     Gi3/1          00:00:00
Gi3/2     Gi3/2          00:00:00
Fa4/1     Fa4/1          00:00:00
Fa4/2     Fa4/2          00:00:00
Fa4/3     Fa4/3          00:00:00
Fa4/4     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     Gi3/4          1 minute 28 secs
Gi3/5     Gi3/5          1 minute 28 secs
Gi3/6     Gi3/6          1 minute 28 secs
Gi4/1     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 <i>mod</i> (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     Gi1/1          1500
Gi1/2     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	<p>The following example shows how to display PVLAN mapping information:</p> <pre>Switch# show interfaces private-vlan mapping Interface Secondary VLAN Type ----- vlan2 301 isolated vlan2 302 isolated Switch#</pre>
-----------------	--

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 <i>module</i>	(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     Te1/1             connected   1         full    10G    10GBase-LR
Te1/2     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     Fa9/4             notconnect   link-flap
Fa9/5     Fa9/5             err-disabled  psecure_violation  3-5
Fa9/6     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 Converter:

```
Switch# show interfaces status module 1
Port Name Status Vlan Duplex Speed Type
Tel/1 inactive 1 full 10G No X2
Tel/2 inactive 1 full 10G No X2
Tel/3 inactive 1 full 10G No X2
Tel/4 notconnect 1 full 10G No X2
Tel/5 notconnect 1 full 10G No X2
Tel/6 notconnect 1 full 10G No X2
Gil/7 notconnect 1 full 1000 No Gbic
Gil/8 notconnect 1 full 1000 No Gbic
Gil/9 notconnect 1 full 1000 No Gbic
Gil/10 notconnect 1 full 1000 No Gbic
Gil/11 notconnect 1 full 1000 No Gbic
Gil/12 notconnect 1 full 1000 No Gbic
Gil/13 inactive 1 full 1000 No Gbic
Gil/14 inactive 1 full 1000 No Gbic
Gil/15 inactive 1 full 1000 No Gbic
Gil/16 inactive 1 full 1000 No Gbic
Gil/17 inactive 1 full 1000 No Gbic
Gil/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	
<i>interface-id</i>	(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

<i>int_name</i>	(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).

      Temperature Voltage Current   Optical   Optical
      (Celsius)  (Volts)  (mA)      Tx Power  Rx Power
-----
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.
```

Port	Temperature (Celsius)	High Alarm Threshold (Celsius)	High Warn Threshold (Celsius)	Low Warn Threshold (Celsius)	Low Alarm Threshold (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

Port	Voltage (Volts)	High Alarm Threshold (Volts)	High Warn Threshold (Volts)	Low Warn Threshold (Volts)	Low Alarm Threshold (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

Port	Current (milliamperes)	High Alarm Threshold (mA)	High Warn Threshold (mA)	Low Warn Threshold (mA)	Low Alarm Threshold (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

show interfaces transceiver

```

          Optical          High Alarm High Warn Low Warn Low Alarm
          Transmit Power  Threshold Threshold Threshold Threshold
          (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
          (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).

```

```

          Temperature Voltage Current      Optical  Optical
          (Celsius)  (Volts)  (mA)      Tx Power Rx Power
          (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
          Threshold Threshold Threshold Threshold
          (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
          Threshold Threshold Threshold Threshold
          (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

```

Port	Current (milliamperes)		High Alarm Threshold (mA)	High Warn Threshold (mA)	Low Warn Threshold (mA)	Low Alarm Threshold (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

Port	Optical Transmit Power (dBm)		High Alarm Threshold (dBm)	High Warn Threshold (dBm)	Low Warn Threshold (dBm)	Low Alarm Threshold (dBm)
Gi2/1	-16.7 (-13.0)	--	3.4	3.2	-0.3	-0.5
Gi2/2	0.8 (5.1)		3.4	3.2	-0.3	-0.5

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

Port	Temperature (Celsius)	Voltage (Volts)	Current (mA)	Optical Tx Power (dBm)	Optical Rx Power (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.
```

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

Port	Voltage (Volts)	High Alarm Threshold (Volts)	High Warn Threshold (Volts)	Low Warn Threshold (Volts)	Low Alarm Threshold (Volts)
Gi2/1	5.03	5.50	5.25	4.75	4.50

show interfaces transceiver

```

Port          Current          High Alarm High Warn Low Warn Low Alarm
-----          (milliamperes) Threshold Threshold Threshold Threshold
Gi2/1         50.6             +          60.0     40.0     10.0     5.0

Port          Optical          High Alarm High Warn Low Warn Low Alarm
-----          Transmit Power Threshold Threshold Threshold Threshold
Gi2/1         -16.7 (-13.0) -- 3.4       3.2      -0.3     -0.5

Port          Optical          High Alarm High Warn Low Warn Low Alarm
-----          Receive Power  Threshold Threshold Threshold Threshold
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 <i>mod</i> (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	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.1(8a)EW</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
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

show interfaces trunk

```

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 <i>vlan-range</i>	(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 <i>interface-name</i>	(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 cef exact-route platform

To display the exact Cisco Express Forwarding (CEF) route for a hardware session, use the **show cef exact-route platform** command in user EXEC or privileged EXEC mode.

```
show {ip | ipv6} cef exact-route platform {ipv4-source-address | ipv6-source-address}
      {src-port port-number} {destination-address} {dest-port port-number}
```

Syntax Description		
ip		IP address.
ipv6		IPv6 address.
platform		Specifies the exact route for a hardware session.
<i>source-address</i>		Network source address.
src-port <i>port-number</i>	(Optional)	Specifies a Layer 4 port number for the source IP address. Valid values for the <i>port-number</i> argument are from 0 to 65535.
<i>destination-address</i>		Network destination address.
dest-port <i>port-number</i>	(Optional)	Specifies a Layer 4 port number for the destination IP address. Valid values for the <i>port-number</i> argument are from 0 to 65535.

Command Modes	
	User EXEC (>)
	Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Release 3.10.1E	This command was introduced.

Usage Guidelines	
	If there are multiple parallel paths to a destination, traffic to that destination is load-balanced across these paths. The show cef exact-route platform command provides the final forwarding path decision.
	Use the show cef exact-route platform command to display the next-hop address for a given source/destination address pair and source/destination port.

Examples The following is a sample output from the **show ip cef exact-route platform** command:

```
Device# show ip cef exact-route platform 172.16.1.3 172.16.1.2
172.16.1.3 -> 172.16.1.2 =>IP adj out of Vlan55, addr 172.17.25.1
```

[Table 3-26](#) describes the significant fields shown in the display:

Field	Description
172.16.1.3 -> 172.16.1.2	From source IP address 172.16.1.3 to destination IP address 172.16.1.2.

Field	Description
IP adj out of Vlan55	Next-hop interface is VLAN interface 55.
addr 172.17.25.1	Next-hop IP address is 172.17.25.1.

The following is a sample output from the **show ipv6 cef exact-route platform** command:

```
Device# show ipv6 cef exact-route platform 2001:DB8:1::1 2001:DB8:1::2
2001:DB8:1::1 -> 2001:DB8:1::2 =>IPV6 adj out of Vlan77, addr 2001:DB8:0:ABCD::1
```

[Table 3-27](#) describes the significant fields shown in the display:

Table 3-27 show ipv6 cef exact-route platform Field Descriptions

Field	Description
2001:DB8:1::1 -> 2001:DB8:1::2	From source IPv6 address 2001:DB8:1::1 to destination IPv6 address 2001:DB8:1::2.
IPV6 adj out of Vlan77	Next-hop interface is VLAN interface 77.
addr 2001:DB8:0:ABCD::1	Next-hop IPv6 address is 2001:DB8:0:ABCD::1.

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

<i>vlan_num</i>	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

<i>ip-address</i>	(Optional) IP address for the binding entries.
<i>mac-address</i>	(Optional) MAC address for the binding entries.
vlan <i>vlan_num</i>	(Optional) Specifies a VLAN.
interface <i>interface_num</i>	(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#
```

show ip dhcp snooping binding

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 3-28 describes the fields in the `show ip dhcp snooping` command output.

Table 3-28 *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 Succeeded Time : None
Last Failed Time : None
Last Failed Reason : No failure recorded.

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

Switch#
```


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

Total Attempts      :          21   Startup Failures :          0
Successful Transfers :          0   Failed Transfers :         21
Successful Reads     :          0   Failed Reads     :          0
Successful Writes    :          0   Failed Writes    :         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 <i>slot/port</i>	(Optional) Specifies the Fast Ethernet interface and the number of the slot and port.	
gigabitethernet <i>slot/port</i>	(Optional) Specifies the Gigabit Ethernet interface and the number of the slot and port; valid values are from 1 to 9.	
tengigabitethernet <i>slot/port</i>	(Optional) Specifies the 10-Gigabit Ethernet interface and the number of the slot and port; valid values are from 1 to 2.	
null <i>interface-number</i>	(Optional) Specifies the null interface and the number of the interface; the only valid value is 0 .	
vlan <i>vlan_id</i>	(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	<i>profile number</i> (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 <i>vlan_id</i>	(Optional) Specifies a VLAN; valid values are from 1 to 1001 and from 1006 to 4094.
<i>a.b.c.d</i>	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 10:

```
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
<code>show ip igmp snooping mrouter</code>	Displays information on the dynamically learned and manually configured multicast switch interfaces.
<code>show mac-address-table multicast</code>	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 <i>interface_num</i>	(Optional) Displays IP address and version information of an interface.
vlan <i>vlan_id</i>	(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 <i>a.b.c.d</i>	(Optional) Displays membership information for a specified reporter.
source <i>a.b.c.d</i>	(Optional) Specifies a reporter, source, or group IP address.
group <i>a.b.c.d</i>	(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/
-----
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 <i>vlan-id</i> (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	<p>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.</p> <p>You can display IGMP snooping information for the VLAN interfaces by entering the show ip igmp interface vlan <i>vlan-num</i> command.</p>
-------------------------	--

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	<i>vlan_num</i> 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	
<i>type</i>	(Optional) Interface type.
<i>number</i>	(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 unreachable 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 3-29 describes the fields that are shown in the example.

Table 3-29 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 3-29 *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 unreachable	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 fastdrop
MFIB fastdrop is enabled.
MFIB fast-dropped flows:
(10.0.0.1, 224.1.2.3, Vlan9 ) 00:01:32
(10.1.0.2, 224.1.2.3, Vlan9 ) 00:02:30
(1.2.3.4, 225.6.7.8, Vlan3) 00:01:50
Switch#
```

Related Commands	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	
<i>interface_type slot/port</i>	(Optional) Interface type and number of the slot and port; valid values for <i>interface type</i> are fastethernet , gigabitethernet , tengigabitethernet , null , and vlan .
<i>host_name</i>	(Optional) Name or IP address as defined in the DNS hosts table.
<i>host_address source</i>	(Optional) IP address or name of a multicast source.
active	(Optional) Displays the rate that active sources are sending to multicast groups.
<i>kbps interface_type num</i>	(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 3-30 describes the fields shown in the output.

Table 3-30 *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 3-30 *show ip mroute Field Descriptions (continued)*

Field	Description
J - Join SPT	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
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)	<p>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.</p> <p>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.</p>
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 3-30 *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	
<i>ip-address</i>	(Optional) Binding IP address.
<i>mac-address</i>	(Optional) Binding MAC address.
dhcp-snooping	(Optional) DHCP-snooping type binding.
static	(Optional) Statically configured binding.
vlan <i>vlan-id</i>	(Optional) VLAN number.
interface <i>interface-name</i>	(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 11.0.0.1:

```
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	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.1(19)EW</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	12.1(19)EW	This command was introduced on the Catalyst 4500 series switch.
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.cccc 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:
      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 31](#) describes the significant fields shown in the display.

Table 31 *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 31 *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 <i>group-list</i> 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 32](#) describes the significant fields shown in the display.

Table 32 *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 33](#) describes the significant fields shown in the display.

Table 33 *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 34 describes the significant fields shown in the display.

Table 34 *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 <i>group-list</i> 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 35 describes the significant fields shown in the display.

Table 35 *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

```

■ **show ip wccp**

```

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 Sent  Last 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	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Cisco IOS Release 15.2(5)E2</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	Cisco IOS Release 15.2(5)E2	This command was introduced on the Catalyst 4500 series switch.
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
```

show ipv6 dhcp-ldra

```

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	<i>interface</i>	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
	dynamic-eid	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 <i>vlan-id</i> (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 <i>vlan-id</i> (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 <i>vlan-id</i>	(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 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 Multicast 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.
<i>client_id</i>		(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	<i>peer_uid</i>	(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 IEBE, 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 view in advance whether an upgrade can be performed with the ISSU process. The compatibility matrix during the ISSU process and later by entering the **show issu comp-matrix** command. To display information on the negotiation of the compatibility matrix data between two software versions on a given system, use the **show issu comp-matrix negotiated** command.

Compatibility matrix data is stored with each Cisco IOS software image that supports ISSU capability. To display stored compatibility matrix information, use the **show issu comp-matrix stored** command.

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

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

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

Examples

This example displays negotiated compatibility matrix information:

```
Switch# show issu comp-matrix negotiated
```

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

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	<i>client_id</i> (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

<i>session_id</i>	(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.
	<i>client_id</i>	(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#
```

■ show issu message

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 Privileged 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	<i>client_id</i> (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	
<i>slot_number</i>	(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 <i>interface-id</i>	(Optional) Specifies the interface for which protocol tunneling information appears. Valid interfaces are physical ports and port channels; the port channel range is 1 to 64.
summary	(Optional) Displays only Layer 2 protocol summary information.
begin	(Optional) Displays information beginning with the line that matches the <i>expression</i> .
exclude	(Optional) Displays information that excludes lines that match the <i>expression</i> .
include	(Optional) Displays the lines that match the specified <i>expression</i> .
<i>expression</i>	(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	
<i>channel-group</i>	(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 switch.

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
          LACPDU      Marker      LACPDU
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 LACPDU Sent and Recv columns display the LACPDU sent and received on each specific interface.
- The LACPDU Pkts and Err columns display the marker protocol packets.

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

```

Port	Flags	State	LACPDU Interval	LACP Port Priority	Admin Key	Oper Key	Port Number	Port 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 3-36 lists the output field definitions.

Table 3-36 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: <ul style="list-style-type: none"> <i>bndl</i>—Port is attached to an aggregator and bundled with other ports. <i>susp</i>—Port is in a suspended state; it is not attached to any aggregator. <i>indep</i>—Port is in an independent state (not bundled but able to switch data traffic. In this case, LACP is not running on the partner port). <i>hot-sby</i>—Port is in a hot-standby state. <i>down</i>—Port is down.
LACPDU 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]: <ul style="list-style-type: none"> bit0: <i>LACP_Activity</i> bit1: <i>LACP_Timeout</i> bit2: <i>Aggregation</i> bit3: <i>Synchronization</i> bit4: <i>Collecting</i> bit5: <i>Distributing</i> bit6: <i>Defaulted</i> bit7: <i>Expired</i>

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

Port      Partner
System ID System ID      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 <i>feature-name</i>	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 switch.
IOS XE 3.4.2	Keyword right-to-use introduced on the Catalyst 4500 series switch

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
ibase 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 ibase 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,SLjP0SXuZ0q0f4QTYxc1pSQY51xj31fh7ZfTD6AskNyeUYT8sCUesi9IVKB8
5wsZSX1HZiXwOd9RHp3mjmnhxFDnS0e6UxjgXgqvV:$AQEBIf8B///kh4dluXv+U+xjUPlzoc3++jpv9d8He4jOuba
fbkmmOtaOYAoB3inJLnLlyv50VCuRqwInXo3s+nsLU7rOtdOxoIxyZAo3LYmUJ+MFzsqlhKoJv1PyEvQ8H21MNUjVb
hoN0gyIWsyiJaM8AQIkVBQFzhr10GYoLVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=
Comment:
Hash: Z+EY3celcsQlVpRGc5NNy5ypmds=
License Store: Dynamic License Storage
License Store: Primary License Storage
License Store: Dynamic License Storage
License Index: 0
License: 11 entservices 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE ADD INFINITE_KEYS
INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL NiL Ni NiL NiL 5_MINS NiL
BGf3gQnLuroDmnnMJMwVva2ukR8kP2JZyInKpmOXpa32jwPuSbmHvcSRiSSaqBngV8$AQEBIQAB///FTlc+Qu1Xlg2
Z+yB2StUHHymf2w5PEw+cYg/hTOKYCI+oXi0jwBZ2iLrYTKYwxSSRqwInXo3s+nsLU7rOtdOxoIxyZAo3LYmUJ+MFz
sqlhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYoLVzdzfJfEPQIx6tZ++/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
1lnG2zXePlBt,ifk7ZReL80LqzvzrUCelWrBp41FC3jOKer6ZMT7XC4834W3Ev7fmleXoWaK58t:oDeH5RI1V3dVE
2VpAnYb7WiKDz9En8PfrI7vewayNbschEXBD9:tfPfir6GaALUFwsLxcqYzHuL2$AQEBIf8B///mCS09+7kn+8zTC
3WX1YS9if+g0e8AjRRu1Jq3Kye4y8wv4c+Y9FHJ7Ro/mw7ERwqRqwInXo3s+nsLU7rOtdOxoIxyZAo3LYmUJ+MFzsq
lhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYoLVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=
Comment:
Hash: 9w09jAFGBzi2w6XQC1jLOBe2p+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
YXNJUtpFJiC2Rpd1SjNVQBCpQUBNt59tdkJJTgKwmLTKj:vmp,sVkmiiRYLfmHQfj$AQEBIf8B//kagzg0R7bT5rn
6dVYVPUFmxBlUsblGgbkInHYo55DJzHE/Bqnlf9keNdSyzPbUhsRqWInXo3snsLU7rOtdOxoIxYZAo3LYmUJ+MFzsq
lhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYo1VzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCy=
Comment:
Hash: H6zsXVLv9TF1mTffGm0tK4VHJ2Q=
License Index: 3
License: 12 ipbase 1.0 LONG TRIAL DISABLED DISABLED DISABLED STANDALONE ADD INFINITE_KEYS
INFINITE_KEYS 1 JAN 2006 1 JAN 2035 NiL NiL SLM_CODE DEMO NiL NiL Ni NiL NiL 5_MINS
NOTLOCKEDNOTLOCKEDHBL
Zh0GdIANTlXwW6LJgQ95LB0aCazzbsjSOL4HUaqcySLcOvcLq,d04oTgS8pJbHIO3BaD0tgELHog9egQWj9bCJ3,sm
2jRaJkgkhYKO9BrbWYLOA,mO3Qe2E,TPJou8fms:LtvrfctzLbujmB0XcB68MPLm$AQEBIf8B//+O8JwRWipzpfjtWl
AItclx+D6NlhKMyqS1hJoxCM1Txgw8BpmG5QQY5nCiE14CPvVKRqWInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFzsq
lhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYo1VzdzfJfEPQIx6tZ++/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 <i>interface</i>	Interface type; possible valid value is gigabitethernet .
<i>interface-number</i>	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 3-37](#) lists the fields in the **show mab** command.

Table 3-37 *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 3-38](#) lists the possible values for the state of the MAB state machine.

Table 3-38 *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 3-38 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 3-39 lists the possible displayed values for the MAB authorization status.

Table 3-39 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	<i>interface</i>	(Optional) Specifies the interface type; valid values are ethernet , fastethernet , gigabitethernet , tengigabitethernet , pos , atm , port-channel , and ge-wan .
	<i>interface-number</i>	(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		
<i>mac_addr</i>		48-bit MAC address; the valid format is H.H.H.
interface <i>type slot/port</i>	(Optional)	Displays information for a specific interface; valid values for <i>type</i> are fastethernet , gigabitethernet , and tengigabitethernet .
protocol <i>protocol</i>	(Optional)	Specifies a protocol. See the “Usage Guidelines” section for more information.
vlan <i>vlan_id</i>	(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 <i>vlan_id</i> (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 <i>vlan_id</i> (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 <i>mac_addr</i>	(Optional) Specifies a 48-bit MAC address; the valid format is H.H.H.
interface <i>type slot/port</i>	(Optional) Specifies an interface to match; valid values for <i>type</i> are fastethernet , gigabitethernet , and tengigabitethernet .
protocol <i>protocol</i>	(Optional) Specifies a protocol. See the “Usage Guidelines” section for more information.
vlan <i>vlan_id</i>	(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	<i>type</i>	Interface type; valid values are ethernet , fastethernet , gigabitethernet , and tengigabitethernet .
	<i>slot/port</i>	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 <i>vlan-id</i>	(Optional) Displays information for a specific VLAN. The range is 1 to 4094.	
 begin	(Optional) Displays the line that matches the <i>expression</i> .	
 exclude	(Optional) Displays excluded lines that match the <i>expression</i> .	
 include	(Optional) Displays included lines that match the specified <i>expression</i> .	
<i>expression</i>	(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	Parameter	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
	<code>show mac-address-table address</code>	Displays the information about the MAC-address table.
	<code>show mac-address-table aging-time</code>	Displays MAC address table aging information.
	<code>show mac-address-table count</code>	Displays the number of entries currently in the MAC address table.
	<code>show mac-address-table dynamic</code>	Displays the dynamic MAC address table entries only.
	<code>show mac-address-table interface</code>	Displays the MAC address table information for a specific interface.
	<code>show mac-address-table protocol</code>	Displays the MAC address table information that is based on the protocol.
	<code>show mac-address-table static</code>	Displays the static MAC address table entries only.
	<code>show mac-address-table vlan</code>	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.
	<i>interface-id</i>	(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	Parameter	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	Parameter	Description
	address <i>mac_addr</i>	(Optional) Specifies a 48-bit MAC address to match; the valid format is H.H.H.
	interface <i>type number</i>	(Optional) Specifies an interface to match; valid values for <i>type</i> are fastethernet , gigabitethernet , and tengigabitethernet .
	protocol <i>protocol</i>	(Optional) Specifies a protocol. See the “Usage Guidelines” section for more information.
	vlan <i>vlan_id</i>	(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 <i>vlan_id</i>	(Optional) Displays the entries for a specific VLAN; valid values are from 1 to 4094.	
protocol <i>protocol</i>	(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 display the 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	<i>device_id</i>	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	<i>interface_id</i>	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 <i>string</i>	Displays information for devices that match the filter.
interface <i>interface_id</i>	Displays information about devices attached to the specified interface.
mac <i>mac_address</i>	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.
	<i>built-in</i>	Displays device classification information from the built-in device table.
	<i>default</i>	Displays device classification information from the default device table.
	filter <i>string</i>	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

show macro auto monitor type

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	<i>mod</i>	(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      0000000000
 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.
<i>session-range</i>	(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.
<i>session-number</i>	(Optional)	Session number; valid values are from 1 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	
<i>name</i>	Specifies the filename.
display-filter <i>filter-string</i>	Specifies the display filter string according to Wireshark's display-filter syntax.
brief detailed dump	Determines the display mode. <ul style="list-style-type: none"> 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 `abcdefghijklmnop
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		
<i>interface-id</i>	(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 <i>vlan-id</i>	(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

```

Related Commands

Command	Description
mvr (global configuration)	Enables and configures multicast VLAN registration on the switch.
mvr (interface configuration)	Configures MVR ports.
show mvr	Displays the global MVR configuration on the switch.
show mvr members	Displays all receiver ports that are members of an MVR multicast group.

show mvr members

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	<i>ip-address</i>	(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 display information about the collector and global stats, use the **show netflow-lite exporter** command.

show netflow-lite exporter *exporter-name*

Syntax Description

exporter-name Specifies an exporter name.

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.
	etr	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

<i>monitor-number</i>	Specifies a monitor name.
<i>interface-name</i>	Specifies an interface.
<i>vlan-id</i>	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

```

Related Commands

Command	Description
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

<i>sampler-name</i>	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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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 nmosp capability** command:

```
Switch# show nmosp capability
NMSP Switch Capability
-----
Service           Subservice
-----
Attachment        Wired Station
Location          Subscription
Switch#
```

This is an example of output from the **show nmosp notification interval** command:

```
Switch# show nmosp 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 nmosp statistics connection** and **show nmosp statistics summary** commands:

```
Switch# show nmosp 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 nmosp 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#
```

Related Commands

Command	Description
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

<i>group-number</i>	(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

```

Port	Flags	State	Timers	Hello Interval	Partner Count	PAgP Priority	Learning 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

```

Port	Partner Name	Partner Device ID	Partner Port	Age	Flags	Partner Group 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

```

Port	Partner Name	Partner Device ID	Partner Port	Age	Flags	Partner Group 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	<i>group-number</i> (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
Router#
```

```

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
Fal/2/13 Yes          mr-rogers-nbr          Fal/2/13 1.1
Fal/2/14 Yes          mr-rogers-nbr          Fal/2/14 1.1
Gi2/1/15 Yes          mr-rogers-nbr          Fal/2/15 1.1
Gi2/1/16 Yes          mr-rogers-nbr          Fal/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
Fal/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	<i>policy_map_name</i> (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 3-40](#) 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 3-40 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 <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> .
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 <i>interface-number</i>	(Optional)	Specifies the Fast Ethernet 802.3 interface.
gigabitethernet <i>interface-number</i>	(Optional)	Specifies the Gigabit Ethernet 802.3z interface.
port-channel <i>number</i>	(Optional)	Specifies the port channel.
vlan <i>vlan_id</i>	(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 14
source-port 14 destination-port
Switch(config-cmap)# exit
Switch(config)# policy-map p1
Switch(config-pmap)# class c1
Switch(config-pmap-c)# police 1000000 9000
Switch(config-pmap-c)# exit
Switch(config-pmap)# exit
Switch(config)# interface fastEthernet 6/1
Switch(config-if)# service-policy input p1
Switch(config-if)# end
Switch# write memory
Switch# show policy-map interface
FastEthernet6/1

class-map c1
  match flow ip source-address ip destination-address ip protocol 14 source-port 14
  destination-port
  !
  policy-map p1

```

```

class c1
  police 1000000 bps 9000 byte conform-action transmit exceed-action drop
!
interface FastEthernet 6/1
  service-policy input p1

Switch# show policy-map p1
  Policy Map p1
    Class c1
      police 1000000 bps 9000 byte conform-action transmit exceed-action drop

Switch# show policy-map interface
  FastEthernet6/1

  Service-policy input: p1

  Class-map: c1 (match-all)
    15432182 packets
    Match: flow ip source-address ip destination-address ip protocol 14 source-port 14
  destination-port
    police: Per-interface
      Conform: 64995654 bytes Exceed: 2376965424 bytes

  Class-map: class-default (match-any)
    0 packets
    Match: any
      0 packets
Switch#

```

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 <i>interface-id</i>	(Optional) Displays QoS policy-map information for a specific interface.
vlan <i>vlan-id</i>	(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	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	Parameter	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 addresses on Fast Ethernet port 1:

```

Switch# show port-security interface fastethernet5/1 vlan
Default maximum: 22
VLAN Maximum Current
2          22      3
3          22      3
5          22      1
6          22      2
Switch#

```

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.
<i>interface</i> detail	(Optional) Detailed information on the PoE status for the interface
consumption default	(Optional) Displays the PoE consumption.
module <i>mod</i> 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
Supply Model No          Type          Status          Fan      Inline
          Sensor          Status
-----
PS1     PWR-C45-2800AC        AC 2800W      good           good     good
PS2     PWR-C45-1000AC        AC 1000W      err-disable    good     n.a.

*** Power Supplies of different type have been detected***

Power supplies needed by system      :1
Power supplies currently available   :1

Power Summary
(in Watts)          Used          Maximum
-----
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
Supply Model No          Type          Status          Fan      Inline
          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 (Watts)	AdminConsumption (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 Supply Model No Type Status Fan Sensor Inline 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
(in Watts)      Used      Maximum
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)
-----

```

```

Mod      Used      Maximum
-----
1         5         25
-----

```

```

Mod      Model      Watts Used of System Power (12V)
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

```

```

Mod      Model      Watts Used of System Power (12V)
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)
```


Mod	Model	Inline Power Admin		Inline Power Oper		Efficiency
		PS	Device	PS	Device	
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)

Mod	Model	Inline Power Admin		Inline Power Oper		Efficiency
		PS	Device	PS	Device	
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 JAE1132SXR
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	
<i>interfacename</i>	(optional) Displays PoE policing and monitoring status for a particular interface.
module <i>n</i>	(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 pppoe intermediate-agent information interface *interface*

show pppoe intermediate-agent statistics interface *interface*

Syntax Description	interface <i>interface</i> Interface for which information or statistics are displayed.				
Command Default	This command has no default settings.				
Command Modes	Privileged EXEC mode				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.2(50)SG</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	12.2(50)SG	This command was introduced on the Catalyst 4500 series switch.
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
```

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

show qos

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

show qos

Syntax Description This command has no arguments or keywords.

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	<i>aggregate_name</i> (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 queuing information, use the **show qos interface** command.

```
show qos interface {fastethernet interface-number | gigabitethernet interface-number} |
[vlan vlan_id | port-channel number]
```

Syntax Description	Parameter	Description
	fastethernet <i>interface-number</i>	Specifies the Fast Ethernet 802.3 interface.
	gigabitethernet <i>interface-number</i>	Specifies the Gigabit Ethernet 802.3z interface.
	vlan <i>vlan_id</i>	(Optional) Specifies the VLAN ID; valid values are from 1 to 4094.
	port-channel <i>number</i>	(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 queuing 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)
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
```

■ show qos maps

```
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	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.1(8a)EW</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	12.1(8a)EW	This command was introduced on the Catalyst 4500 series switch.
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	Privileged 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	<p>This example illustrates how to display configurations included for all the shell functions:</p> <pre>Switch# show shell functions</pre>
-----------------	--

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 | fileys]

Syntax Description	
all	(Optional) Displays all possible Flash information.
chips	(Optional) Displays Flash chip information.
fileys	(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: fileys

----- 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 | fileys]

Syntax Description	all	(Optional) Displays all flash information including the output from the show slot0: chips and show slot0: fileys commands.
	chips	(Optional) Displays flash chip register information.
	fileys	(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: filesystems
----- 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: filesystems
----- 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	
<i>bridge_group</i>	(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.
<i>id</i>	(Optional) Name of the bridge.
inconsistentports	(Optional) Displays the root inconsistency state.
interface <i>type</i>	(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 <i>vlan_id</i>	(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
Name          Port ID Prio  Cost Sts    Designated
-----
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
Name          Port ID Prio  Cost Sts    Designated
-----
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

```

```

-----
Switch#          2 VLANs 0      0      0      2      2

```

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.
	<i>instance-id</i>	(Optional) Instance identification number; valid values are from 0 to 15.
	detail	(Optional) Displays detailed MST protocol information.
	interface <i>interface</i>	(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#
```

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

<i>interface-id</i>	(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 3-41 describes the fields in the **show storm-control** display.

Table 3-41 show storm-control Field Descriptions

Field	Description
Interface	Displays the ID of the interface.
Filter State	Displays the status of the filter: <ul style="list-style-type: none"> 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. <p>Note N/A is displayed for interfaces that do storm control in the hardware.</p>

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       : Tel1/3/1
Router#
```

The following example shows how to display the virtual switch link counter information:

```
Router# show switch virtual link counters
Port                InOctets    InUcastPkts  InMcastPkts  InBcastPkts
Po10                66340451   190415      15637        112069
Tel1/3/1           66981250   194528      15770        112072
Po20                42116619   92926       16406        128593
Te2/2/1            42117401   92932       16406        128593

Port                OutOctets    OutUcastPkts  OutMcastPkts  OutBcastPkts
Po10                39030669   112680      105482        0
Tel1/3/1           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
Tel1/3/1           0            0            0            0        0          0
Po10                0            0            0            0        0          0
Tel1/3/1           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

Interface  State          Peer          Peer          Peer
           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     -             -             -

Interface          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
```

show switch virtual (virtual switch)

```

                                Hello Tx (T4) ms          Hello Rx (T5*) ms
Interface  State           Cfg    Cur    Rem    Cfg    Cur    Rem
-----
Tel1/1/1   operational  500    500    404    5000   5000   4916
Tel1/1/2   link_down   500    -      -      500000 -      -
Tel1/3/3   link_down   500    -      -      500000 -      -
Tel1/3/4   operational  500    500    404    500000 500000 499916
*T5 = min_rx * multiplier
Router#

```

The following example shows how to display redundancy status information for each switch in the virtual switch:

```

Router# show switch virtual redundancy
My Switch Id = 1
Peer Switch Id = 2
Last switchover reason = user forced
Configured Redundancy Mode = sso
Operating Redundancy Mode = sso
Switch 1 Slot 5 Processor Information :
-----
Current Software state = ACTIVE
Uptime in current state = 9 hours, 32 minutes
Image Version = Cisco IOS Software, s72033_rp Software
(s72033_rp-ADVENTERPRISEK9_WAN_DBG-VM), Version 12.2(SIERRA_INTEG_090405) INTERIM SOFTWARE
Synced to V122_32_8_11, 12.2(32.8.11)SR on rainier, Weekly 12.2(32.8.11)SX261
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2009 by Cisco Systems, Inc.
Compiled Mon 06-Apr-09 02:54 by kchristi
BOOT = disk0:mz_good_image,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = ACTIVE
Control Plane State = ACTIVE
Switch 1 Slot 6 Processor Information :
-----
Current Software state = RPR-Warm
Uptime in current state = 4 days, 17 hours, 36 minutes
Image Version =
BOOT = disk0:mz-rbh,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = RPR-Warm
Control Plane State = RPR-Warm
Switch 2 Slot 5 Processor Information :
-----
Current Software state = STANDBY HOT (switchover target)
Uptime in current state = 9 hours, 24 minutes
Image Version = Cisco IOS Software, s72033_rp Software
(s72033_rp-ADVENTERPRISEK9_WAN_DBG-VM), Version 12.2(SIERRA_INTEG_090405) INTERIM SOFTWARE
Synced to V122_32_8_11, 12.2(32.8.11)SR on rainier, Weekly 12.2(32.8.11)SX261
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2009 by Cisco Systems, Inc.
Compiled Mon 06-Apr-09 02:54 by kchristi
BOOT = disk0:mz_good_image,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = ACTIVE
Control Plane State = STANDBY

```

```

Switch 2 Slot 6 Processor Information :
-----
Current Software state = RPR-Warm
Uptime in current state = 4 days, 17 hours, 36 minutes
Image Version =
BOOT = disk0:mz-rbh,12;
CONFIG_FILE =
BOOTLDR =
Configuration register = 0x2
Fabric State = RPR-Warm
Control Plane State = RPR-Warm
Router#

```

The following example shows how to display role and configuration and status information for each switch in the virtual switch:

```

Router# show switch virtual role

Switch  Switch  Status  Preempt  Priority  Role  Session ID
Number                                     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          -

```

show switch virtual (virtual switch)

```

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 submenu.

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 uddld

To display the administrative and operational UDLD status, use the **show uddld** privileged EXEC command.

```
show uddld interface-id | neighbors | fast-hello {interface id}
```

Syntax Description		
	<i>interface id</i>	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.
	<i>interface-id</i>	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 uddld fast-hello and show uddld 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 uddld 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
udd (global configuration mode)	Enables aggressive or normal mode in the UDLD protocol and sets the configurable message timer time.
udd (interface configuration mode)	Enables UDLD on an individual interface or prevents a fiber interface from being enabled by the udd (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 <i>vlan_id</i>	(Optional) Displays information about a single VLAN identified by VLAN ID number; valid values are from 1 to 4094.
name <i>name</i>	(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.
<i>type</i>	(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

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 3-42 describes the fields in the **show vlan** command output.

Table 3-42 *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          100          primary
              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	<i>map-name</i> (Optional) Name of the VLAN access map.				
Command Default	This command has no default settings.				
Command Modes	Privileged EXEC mode				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.1(12c)EW</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	12.1(12c)EW	This command was introduced on the Catalyst 4500 series switch.
Release	Modification				
12.1(12c)EW	This command was introduced on the Catalyst 4500 series switch.				
Examples	<p>This command shows how to display the contents of a VLAN access map:</p> <pre>Switch# show vlan access-map mordred Vlan access-map "mordred" 1 match: ip address 13 action: forward capture Switch#</pre>				
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>vlan access-map</td> <td>Enters VLAN access-map command mode to create a VLAN access map.</td> </tr> </tbody> </table>	Command	Description	vlan access-map	Enters VLAN access-map command mode to create a VLAN access map.
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 <i>vlanid</i> (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 switch.

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 Mode	Native VLAN 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** privileged EXEC command.

```
show vlan group [group-name group-name]
```

Syntax Description	group-name (Optional) Displays the VLANs mapped to the specified VLAN group. <i>group-name</i>
---------------------------	--

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 <i>group-name</i> 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 <i>vlan-id</i> (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 <i>interface-id</i>	(Optional) Displays VLAN mapping information for the specified interface.	
 begin	(Optional) Displays begins with the line that matches the <i>expression</i> .	
 exclude	(Optional) Displays excludes lines that match the <i>expression</i> .	
 include	(Optional) Displays includes lines that match the specified <i>expression</i> .	
<i>expression</i>	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	<i>type</i>	(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 3-43 describes the fields in the **show vlan private-vlan** command output.

Table 3-43 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 switch.

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	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.1(13)EW</td> <td>This command was introduced on the Catalyst 4500 series switch.</td> </tr> </tbody> </table>	Release	Modification	12.1(13)EW	This command was introduced on the Catalyst 4500 series switch.
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	Parameter	Description
	lmp	Specifies the Link Maintenance Protocol (LMP) information.
	rrp	Specifies the Role Resolution Protocol (RRP) information.
	<i>type</i>	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
                    Flag MAC          Swtch Port
Port   Flag State
-----
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
                    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
Interface  State          Hello Tx (T4) ms    Hello Rx (T5*) ms
          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  Count  Peer      Peer
-----
TRUE   V      1         1         1
Switch Peer  Switch   Status    Preempt   Priority  Role     Local  Remote
      Group Number
-----
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
-----          -----          -----          -----
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 V11 (lowest numbered VLAN interface 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 3-44](#) describes the fields in the **show vtp** command output.

Table 3-44 *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.

