



Cisco IOS Commands for the Catalyst 4500 Series Switches

This chapter contains an alphabetical listing of Cisco IOS commands for the Catalyst 4500 series switches. For information about Cisco IOS commands that are not included in this publication, refer to Cisco IOS Release 12.1 Configuration Guides and Command References at this URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_product_indices_list.html

#macro keywords

To specify the help string for the macro keywords, use the **#macro keywords** command.

#macro keywords [keyword1] [keyword2] [keyword3]

Syntax Description	keyword 1	(Optional) Specifies a keyword that is needed while applying a macro to an interface.
	keyword 2	(Optional) Specifies a keyword that is needed while applying a macro to an interface.
	keyword 3	(Optional) Specifies a keyword that is needed while applying a macro to an interface.

Defaults This command has no default settings.

Command Modes Global configuration

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

Usage Guidelines If you do not specify the mandatory keywords for a macro, the macro is to be considered invalid and fails when you attempt to apply it. By entering the **#macro keywords** command, you will receive a message indicating what you need to include to make the syntax valid.

Examples This example shows how to specify the help string for keywords associated with a macro named test:

```
Switch(config)# macro name test
macro name test
Enter macro commands one per line. End with the character '@'.
#macro keywords $VLAN $MAX
switchport
@

Switch(config)# int g1/1
Switch(config-if)# macro apply test ?
WORD Keyword to replace with a value e.g $VLAN, $MAX << It is shown as help
<cr>
```

Related Commands

- [macro apply cisco-desktop](#)
- [macro apply cisco-phone](#)
- [macro apply cisco-router](#)
- [macro apply cisco-switch](#)

aaa accounting dot1x default start-stop group radius

To enable accounting for 802.1X authentication sessions, use the **aaa accounting dot1x default start-stop group radius** command. To disable accounting, use the **no** form of this command.

aaa accounting dot1x default start-stop group radius

no aaa accounting dot1x default start-stop group radius

Syntax Description	This command has no arguments or keywords.
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Defaults	Accounting is disabled.
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Command Modes	Global configuration
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Command History	Release	Modification
	12.2(18)EW	Support for this command was introduced on the Catalyst 4500 series switch.

Usage Guidelines	<p>802.1X accounting requires a RADIUS server.</p> <p>This command enables the Authentication, Authorization, and Accounting (AAA) client's accounting feature to forward 802.1X update and watchdog packets from the 802.1X supplicant (workstation client) to the authentication (RADIUS) server. (Watchdog packets are defined as EAPOL-LOGON, EAPOL-LOGOFF, and EAPOL-INTERIM messages.) Successful authentication and authorization of the supplicant by the authentication server is required before these packets are considered valid and are forwarded. When the client is reauthenticated, an interim-update accounting notice is sent to the accounting server.</p>
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Examples	This example shows how to configure 802.1X accounting:
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```
Switch(config)# aaa accounting dot1x default start-stop group radius
```

**Note**

The RADIUS authentication server must be properly configured to accept and log update or watchdog packets from the AAA client.

Related Commands	aaa accounting system default start-stop group radius
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aaa accounting system default start-stop group radius

To receive the session termination messages after the switch reboots, use the **aaa accounting system default start-stop group radius** command. To disable accounting, use the **no** form of this command.

aaa accounting system default start-stop group radius

no aaa accounting system default start-stop group radius

Syntax Description This command has no arguments or keywords.

Defaults Accounting is disabled.

Command Modes Global configuration mode

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

Usage Guidelines 802.1X accounting requires the RADIUS server.

This command enables the AAA client's accounting feature to forward 802.1X update and watchdog packets from the 802.1X supplicant (workstation client) to the authentication (RADIUS) server. (Watchdog packets are defined as EAPOL-LOGON, EAPOL-LOGOFF, and EAPOL-INTERIM messages.) Successful authentication and authorization of the supplicant by the authentication server is required before these packets are considered valid and are forwarded. When the client is reauthenticated, an interim-update accounting notice is sent to the accounting server.

Examples This example shows how to generate a logoff after a switch reboots:

```
Switch(config)# aaa accounting system default start-stop group radius
```



Note

The RADIUS authentication server must be properly configured to accept and log update or watchdog packets from the AAA client.

Related Commands [aaa accounting dot1x default start-stop group radius](#)

access-group mode

To specify the override modes (for example, VACL overrides PACL) and the non-override modes (for example, merge or strict mode), use the **access-group mode** command. To return to preferred port mode, use the **no** form of this command.

access-group mode {prefer {port | vlan} | merge}

no access-group mode {prefer {port | vlan} | merge}

Syntax Description

prefer port	Specifies that the PACL mode take precedence if PACLs are configured. If no PACL features are configured on the port, other features applicable to the interface are merged and applied on the interface.
prefer vlan	Specifies that the VLAN-based ACL mode take precedence. If no VLAN-based ACL features are configured on the port's VLAN, the PACL features on the port are applied.
merge	Merges applicable ACL features before they are programmed into the hardware.

Defaults

PACL override mode

Command Modes

Interface configuration

Command History

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

Usage Guidelines

On the Layer 2 interface, prefer port, prefer VLAN, and merge modes are supported. A Layer 2 interface can have one IP ACL applied in either direction (one inbound and one outbound).

Examples

This example shows how to make the PACL mode on the switch take effect:

```
(config-if)# access-group mode prefer port
```

This example shows how to merge applicable ACL features:

```
(config-if)# access-group mode merge
```

Related Commands

[show access-group mode interface](#)
[show ip interface](#) (refer to Cisco IOS documentation)
[show mac access-group interface](#)

access-list hardware entries

To designate how ACLs are programmed into the switch hardware, use the **access-list hardware entries** command.

access-list hardware entries {packed | scattered}

Syntax Description	packed	Directs the software to use the first entry with a matching mask when selecting an entry from the ACL TCAM for programming the ACEs in an ACL.
	scattered	Directs the software to use the first entry with a free mask when selecting an entry from the ACL TCAM for programming the ACEs in an ACL.

Defaults The ACLs are programmed as packed.

Command Modes Global configuration

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

Usage Guidelines Two types of hardware resources are used when ACLs are programmed: entries and masks. If one of these resources is consumed, no additional ACLs can be programmed into the hardware. If the masks are consumed, but the entries are available, change the programming algorithm from **packed** to **scattered** to make the masks available. This action allows additional ACLs to be programmed into the hardware.

The goal is to use TCAM resources more efficiently; that is, to minimize the number of masks per ACL entries. To compare TCAM utilization when using the **scattered** or **packed** algorithms, use the **show platform hardware acl statistics utilization brief** command. To change the algorithm from **packed** to **scattered**, use the **access-list hardware entries** command.

Examples This example shows how to program ACLs into the hardware as packed. After they are programmed, you will need 89 percent of the masks to program only 49 percent of the ACL entries.

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# access-list hardware entries packed
Switch(config)# end
Switch#
01:15:34: %SYS-5-CONFIG_I: Configured from console by console
Switch#
Switch# show platform hardware acl statistics utilization brief
Entries/Total(%)  Masks/Total(%)
-----
Input  Acl(PortAndVlan)  2016 / 4096 ( 49)   460 / 512 ( 89)
Input  Acl(PortOrVlan)   6 / 4096 (  0)     4 / 512 (  0)
Input  Qos(PortAndVlan)  0 / 4096 (  0)     0 / 512 (  0)
Input  Qos(PortOrVlan)   0 / 4096 (  0)     0 / 512 (  0)
```

```

Output Acl(PortAndVlan)    0 / 4096 ( 0)    0 / 512 ( 0)
Output Acl(PortOrVlan)     0 / 4096 ( 0)    0 / 512 ( 0)
Output Qos(PortAndVlan)    0 / 4096 ( 0)    0 / 512 ( 0)
Output Qos(PortOrVlan)     0 / 4096 ( 0)    0 / 512 ( 0)

```

L4Ops: used 2 out of 64

Switch#

This example shows how to reserve space (scatter) between ACL entries in the hardware. The number of masks required to program 49 percent of the entries has decreased to 49 percent.

Switch# **configure terminal**

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)# **access-list hardware entries scattered**

Switch(config)# **end**

Switch#

01:39:37: %SYS-5-CONFIG_I: Configured from console by console

Switch#

Switch# **show platform hardware acl statistics utilization brief**

```

Entries/Total(%)  Masks/Total(%)
-----
Input  Acl(PortAndVlan)  2016 / 4096 ( 49)  252 / 512 ( 49)
Input  Acl(PortOrVlan)   6 / 4096 ( 0)    5 / 512 ( 0)
Input  Qos(PortAndVlan)  0 / 4096 ( 0)    0 / 512 ( 0)
Input  Qos(PortOrVlan)   0 / 4096 ( 0)    0 / 512 ( 0)
Output Acl(PortAndVlan)  0 / 4096 ( 0)    0 / 512 ( 0)
Output Acl(PortOrVlan)   0 / 4096 ( 0)    0 / 512 ( 0)
Output Qos(PortAndVlan)  0 / 4096 ( 0)    0 / 512 ( 0)
Output Qos(PortOrVlan)   0 / 4096 ( 0)    0 / 512 ( 0)

```

L4Ops: used 2 out of 64

Switch#

action

To specify an action to be taken when a match occurs in a VACL, use the **action** command. To remove an action clause, use the **no** form of this command.

action {drop | forward}

no action {drop | forward}

Syntax Description

drop	Sets the action to drop packets.
forward	Sets the action to forward packets to their destination.

This command has no default settings.

Command Modes

VLAN access-map

Command History

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

Usage Guidelines

In a VLAN access map, if at least one ACL is configured for a packet type (IP or MAC), the default action for the packet type is **drop** (deny).

If an ACL is not configured for a packet type, the default action for the packet type is **forward** (permit).

If an ACL for a packet type is configured and the ACL is empty or undefined, the configured action will be applied to the packet type.

Examples

This example shows how to define a drop action:

```
Switch(config-access-map) # action drop
Switch(config-access-map) #
```

This example shows how to define a forward action:

```
Switch(config-access-map) # action forward
Switch(config-access-map) #
```

Related Commands

match
show vlan access-map
vlan access-map

apply

To implement a new VLAN database, increment the configuration number, save the configuration number in NVRAM, and propagate the configuration number throughout the administrative domain, use the **apply** command.

apply

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

Usage Guidelines	<p>The apply command implements the configuration changes that you made after you entered VLAN database mode and uses them for the running configuration. This command keeps you in VLAN database mode.</p>
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You cannot use this command when the switch is in the VTP client mode.

You can verify that the VLAN database changes occurred by entering the **show vlan** command from privileged EXEC mode.

Examples	<p>This example shows how to implement the proposed new VLAN database and to recognize it as the current database:</p>
----------	--

```
Switch(config-vlan)# apply
Switch(config-vlan)#
```

Related Commands	<p>abort (refer to Cisco IOS documentation) exit (refer to Cisco IOS documentation) reset show vlan shutdown vlan (refer to Cisco IOS documentation) vtp (global configuration mode)</p>
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arp access-list

To define an ARP access list or add clauses at the end of a predefined list, use the **arp access-list** command.

arp access-list *name*

Syntax Description	<i>name</i> Specifies the access control list name.
--------------------	---

Defaults	None
----------	------

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

Examples	This example shows how to define an ARP access list named static-hosts:
	Switch(config)# arp access-list static-hosts
	Switch(config)#

Related Commands	deny ip arp inspection filter vlan permit
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attach module

To remotely connect to a specific module, use the **attach module** configuration command.

attach module *mod*

Syntax Description	<i>mod</i> Target module for the command.
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Defaults	This command has no default settings.
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Command Modes	Privileged
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Command History	Release	Modification
	12.1(19)EW	This command was first introduced.

Usage Guidelines	This command applies only to the Access Gateway Module on Catalyst 4500 series switches.
	The valid values for <i>mod</i> depend on the chassis that are used. For example, if you have a Catalyst 4006 chassis, valid values for the module are from 2 to 6. If you have a 4507R chassis, valid values are from 3 to 7.
	When you execute the attach module <i>mod</i> command, the prompt changes to Gateway#.
	This command is identical in the resulting action to the session module <i>mod</i> and the remote login module <i>mod</i> commands.

Examples	This example shows how to remotely log in to an Access Gateway Module:
	Switch# attach module 5
	Attaching console to module 5
	Type 'exit' at the remote prompt to end the session
	Gateway>

Related Commands	remote login module session module
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auto qos voip

To automatically configure quality of service (auto-QoS) for voice over IP (VoIP) within a QoS domain, use the **auto qos voip** interface configuration command. To change the auto-QoS configuration settings to the standard QoS defaults, use the **no** form of this command.

auto qos voip { **cisco-phone** | **trust** }

no auto qos voip { **cisco-phone** | **trust** }

Syntax Description	cisco-phone	Connects the interface to a Cisco IP phone and automatically configures QoS for VoIP. The CoS labels of incoming packets are trusted only when the telephone is detected.
	trust	Connects the interface to a trusted switch or router and automatically configures QoS for VoIP. The CoS and DSCP labels of incoming packets are trusted.

Defaults	Auto-QoS is disabled on all interfaces.
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Command Modes	Interface configuration
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Command History	Release	Modification
	12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.

Use this command to configure the QoS that is appropriate for VoIP traffic within the QoS domain. The QoS domain includes the switch, the interior of the network, and the edge devices that can classify incoming traffic for QoS.

Use the **cisco-phone** keyword on the ports at the edge of the network that are connected to Cisco IP phones. The switch detects the telephone through the Cisco Discovery Protocol (CDP) and trusts the CoS labels in packets that are received from the telephone.

Use the **trust** keyword on the ports that are connected to the interior of the network. Because it is assumed that the traffic has already been classified by the other edge devices, the CoS/DSCP labels in these packets are trusted.

When you enable the auto-QoS feature on the specified interface, these actions automatically occur:

- QoS is globally enabled (**qos** global configuration command).
- DBL is enabled globally (**qos dbf** global configuration command).
- When you enter the **auto qos voip cisco-phone** interface configuration command, the trusted boundary feature is enabled. It uses the Cisco Discovery Protocol (CDP) to detect the presence or absence of a Cisco IP phone. When a Cisco IP phone is detected, the ingress classification on the specific interface is set to trust the CoS label that is received in the packet because some old phones do not mark DSCP. When a Cisco IP phone is absent, the ingress classification is set to not trust the CoS label in the packet.

- When you enter the **auto qos voip trust** interface configuration command, the ingress classification on the specified interface is set to trust the CoS label that is received in the packet if the specified interface is configured as Layer 2 (and is set to trust DSCP if the interface is configured as Layer 3).

You can enable auto-QoS on static, dynamic-access, voice VLAN access, and trunk ports.

To display the QoS configuration that is automatically generated when auto-QoS is enabled, enable debugging before you enable auto-QoS. Use the **debug auto qos** privileged EXEC command to enable auto-QoS debugging.

To disable auto-QoS on an interface, use the **no auto qos voip** interface configuration command. When you enter this command, the switch enables standard QoS and changes the auto-QoS settings to the standard QoS default settings for that interface. This action will not change any global configuration performed by auto-QoS; the global configuration remains the same.

Examples

This example shows how to enable auto-QoS and to trust the CoS and DSCP labels that are received in the incoming packets when the switch or router that is connected to Gigabit Ethernet interface 1/1 is a trusted device:

```
Switch(config)# interface gigabitethernet1/1
Switch(config-if)# auto qos voip trust
```

This example shows how to enable auto-QoS and to trust the CoS labels that are received in incoming packets when the device connected to Fast Ethernet interface 2/1 is detected as a Cisco IP phone:

```
Switch(config)# interface fastethernet2/1
Switch(config-if)# auto qos voip cisco-phone
```

This example shows how to display the QoS configuration that is automatically generated when auto-QoS is enabled:

```
Switch# debug auto qos
AutoQoS debugging is on
Switch# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# interface gigabitethernet1/1
Switch(config-if)# auto qos voip trust
Switch(config-if)#
00:00:56:qos
00:00:57:qos map cos 3 to dscp 26
00:00:57:qos map cos 5 to dscp 46
00:00:58:qos map dscp 32 to tx-queue 1
00:00:58:qos db1
00:01:00:policy-map autoqos-voip-policy
00:01:00: class class-default
00:01:00: db1
00:01:00:interface GigabitEthernet1/1
00:01:00: qos trust cos
00:01:00: tx-queue 3
00:01:00: priority high
00:01:00: shape percent 33
00:01:00: service-policy output autoqos-voip-policy
Switchconfig-if)# interface gigabitethernet1/1
Switch(config-if)# auto qos voip cisco-phone
Switch(config-if)#
00:00:55:qos
00:00:56:qos map cos 3 to dscp 26
00:00:57:qos map cos 5 to dscp 46
00:00:58:qos map dscp 32 to tx-queue 1
00:00:58:qos db1
00:00:59:policy-map autoqos-voip-policy
```

```
00:00:59: class class-default
00:00:59:   dbl
00:00:59: interface GigabitEthernet1/1
00:00:59: qos trust device cisco-phone
00:00:59: qos trust cos
00:00:59: tx-queue 3
00:00:59: priority high
00:00:59: shape percent 33
00:00:59: bandwidth percent 33
00:00:59: service-policy output autoqos-voip-policy
```

You can verify your settings by entering the **show auto qos interface** command.

Related Commands

debug auto qos (refer to Cisco IOS documentation)

qos map cos

qos trust

show auto qos

show qos

show qos interface

show qos maps

auto-sync

To enable automatic synchronization of the configuration files in NVRAM, use the **auto-sync** command. To disable automatic synchronization, use the **no** form of this command.

auto-sync { **startup-config** | **config-register** | **bootvar** | **standard** }

no auto-sync { **startup-config** | **config-register** | **bootvar** | **standard** }

Syntax Description	startup-config	Specifies automatic synchronization of the startup configuration.
	config-register	Specifies automatic synchronization of the configuration register configuration.
	bootvar	Specifies automatic synchronization of the BOOTVAR configuration.
	standard	Specifies automatic synchronization of the startup configuration, BOOTVAR, and configuration registers.

Standard automatic synchronization of all configuration files

Command Modes	Redundancy main-cpu
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Command History	Release	Modification
	12.1(12c)EW	Support for this command was introduced on the Catalyst 4500 series switch (Catalyst 4507R only).

Usage Guidelines	If you enter the no auto-sync standard command, no automatic synchronizations occur.
------------------	---

Examples	This example shows how (from the default configuration) to enable automatic synchronization of the configuration register in the main CPU:
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```
Switch# config terminal
Switch (config)# redundancy
Switch (config-r)# main-cpu
Switch (config-r-mc)# no auto-sync standard
Switch (config-r-mc)# auto-sync configure-register
Switch (config-r-mc)#
```

Related Commands	redundancy
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channel-group

To assign and configure an EtherChannel interface to an EtherChannel group, use the **channel-group** command. To remove a channel group configuration from an interface, use the **no** form of this command.

channel-group *number* **mode** { **active** | **on** | **auto** [**non-silent**] } | { **passive** | **desirable** [**non-silent**] }

no channel-group

Syntax Description	number	Specifies the channel-group number; valid values are from 1 to 64.
	mode	Specifies the EtherChannel mode of the interface.
	active	Enables LACP unconditionally.
	on	Forces the port to channel without PAgP.
	auto	Places a port into a passive negotiating state, in which the port responds to PAgP packets it receives but does not initiate PAgP packet negotiation.
	non-silent	(Optional) Used with the auto or desirable mode when traffic is expected from the other device.
	passive	Enables LACP only if an LACP device is detected.
	desirable	Places a port into an active negotiating state, in which the port initiates negotiations with other ports by sending PAgP packets.

Defaults No channel groups are assigned.

Command Modes Interface configuration

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

Usage Guidelines You do not have to create a port-channel interface before assigning a physical interface to a channel group. If a port-channel interface has not been created, it is automatically created when the first physical interface for the channel group is created.

If a specific channel number is used for the PAgP-enabled interfaces of a channel group, that same channel number cannot be used for configuring a channel that has LACP-enabled interfaces or vice versa.

You can also create port channels by entering the **interface port-channel** command. This will create a Layer 3 port channel. To change the Layer 3 port channel into a Layer 2 port channel, use the **switchport** command before you assign physical interfaces to the channel group. A port channel cannot be changed from Layer 3 to Layer 2 or vice versa when it contains member ports.

You do not have to disable the IP address that is assigned to a physical interface that is part of a channel group, but we recommend that you do so.

Any configuration or attribute changes that you make to the port-channel interface are propagated to all interfaces within the same channel group as the port channel (for example, configuration changes are also propagated to the physical interfaces that are not part of the port channel, but are part of the channel group).

You can create in **on** mode a usable EtherChannel by connecting two port groups together.

**Caution**

Do not enable Layer 3 addresses on the physical EtherChannel interfaces. Do not assign bridge groups on the physical EtherChannel interfaces because it creates loops.

Examples

This example shows how to add Gigabit Ethernet interface 1/1 to the EtherChannel group that is specified by port-channel 45:

```
Switch(config-if)# channel-group 45 mode on  
Creating a port-channel interface Port-channel45  
Switch(config-if)#
```

Related Commands

[interface port-channel](#)

show interfaces port-channel (refer to Cisco IOS documentation)

channel-protocol

To enable LACP or PAgP on an interface, use the **channel-protocol** command. To disable the protocols, use the **no** form of this command.

channel-protocol {lacp | pagp}

no channel-protocol {lacp | pagp}

Syntax Description

lacp	Enables LACP to manage channeling.
pagp	Enables PAgP to manage channeling.

Defaults

PAgP

Command Modes

Interface configuration

Command History

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

Usage Guidelines

This command is not supported on systems that are configured with a Supervisor Engine I.

You can also select the protocol using the **channel-group** command.

If the interface belongs to a channel, the **no** form of this command is rejected.

All ports in an EtherChannel must use the same protocol; you cannot run two protocols on one module.

PAgP and LACP are not compatible; both ends of a channel must use the same protocol.

You can manually configure a switch with PAgP on one side and LACP on the other side in the **on** mode.

You can change the protocol at any time, but this change causes all existing EtherChannels to reset to the default channel mode for the new protocol. You can use the **channel-protocol** command to restrict anyone from selecting a mode that is not applicable to the selected protocol.

Configure all ports in an EtherChannel to operate at the same speed and duplex mode (full duplex only for LACP mode).

For a complete list of guidelines, refer to the “Configuring EtherChannel” section of the *Catalyst 4500 Series Switch Cisco IOS Software Configuration Guide*.

Examples

This example shows how to select LACP to manage channeling on the interface:

```
Switch(config-if) # channel-protocol lacp
Switch(config-if) #
```

Related Commands

[channel-group](#)
[show etherchannel](#)

class-map

To access the QoS class map configuration mode to configure QoS class maps, use the **class-map** command. To delete a class map, use the **no** form of this command.

class-map [**match-all** | **match-any**] *name*

no class-map [**match-all** | **match-any**] *name*

Syntax Description	match-all	(Optional) Specifies that all match criteria in the class map must be matched.
	match-any	(Optional) Specifies that one or more match criteria must match.
	<i>name</i>	Name of the class map.

Defaults Match all criteria.

Command Modes Global configuration

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

Usage Guidelines The *name* and *acl_name* arguments are case sensitive.

Use the **class-map** command and its subcommands on individual interfaces to define packet classification, marking, aggregate, and flow policing as part of a globally named service policy.

These commands are available in QoS class map configuration mode:

- **exit**—Exits you from QoS class map configuration mode.
- **no**—Removes a match statement from a class map.
- **match**—Configures classification criteria.

These optional subcommands are also available:

- **access-group** {*acl_index* | **name** *acl_name*}
- **ip** {**dscp** | **precedence**} *value1 value2... value8*
- **any**

The following subcommands appear in the CLI help, but they are not supported on LAN interfaces:

- **input-interface** {*interface interface_number* | **null** *number* | **vlan** *vlan_id*}
- **protocol** *linktype*
- **destination-address** **mac** *mac_address*
- **source-address** **mac** *mac_address*
- **qos-group**

- **mpls**
- **no**

After you have configured the class map name and are in class map configuration mode, you can enter the **match** subcommands. The syntax for these subcommands is as follows:

```
match {[access-group {acl_index | name acl_name}] | [ip {dscp | precedence} value1 value2...  
value8]}
```

See [Table 2-1](#) for a syntax description of the **match** subcommands.

Table 2-1 Syntax Description for the match Command

Optional Subcommand	Description
access-group <i>acl_index</i> <i>acl_name</i>	Specifies the access list index or access list names; valid access list index values are from 1 to 2699.
access-group <i>acl_name</i>	Specifies the named access list.
ip dscp <i>value1 value2</i> ... <i>value8</i>	Specifies the IP DSCP values to match; valid values are from 0 to 63. Enter up to eight DSCP values separated by white spaces.
ip precedence <i>value1</i> <i>value2 ... value8</i>	Specifies the IP precedence values to match; valid values are from 0 to 7. Enter up to eight precedence values separated by white spaces.

Examples

This example shows how to access the **class-map** commands and subcommands and to configure a class map named **ipp5** and enter a match statement for ip precedence 5:

```
Switch# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# class-map ipp5
Switch(config-cmap)# match ip precedence 5
Switch(config-cmap)#
```

This example shows how to configure the class map to match an already configured access list:

```
Switch(config-cmap)# match access-group IPacl1
Switch(config-cmap)#
```

Related Commands

policy-map
service-policy
show class-map
show policy-map
show policy-map interface

clear counters

To clear the interface counters, use the **clear counters** command.

```
clear counters [{FastEthernet interface_number} | {GigabitEthernet interface_number} |
{null interface_number} | {port-channel number} | {vlan vlan_id}]
```

Syntax Description

FastEthernet <i>interface_number</i>	(Optional) Specifies the Fast Ethernet interface; valid values are from 1 to 9.
GigabitEthernet <i>interface_number</i>	(Optional) Specifies the Gigabit Ethernet interface; valid values are from 1 to 9.
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 from 1 to 64.
vlan <i>vlan_id</i>	(Optional) Specifies the VLAN; valid values are from 1 to 4096.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

This command clears all the current interface counters from all the interfaces unless you specify an interface.



Note

This command does not clear the counters that are retrieved using SNMP, but only those seen when you enter the **show interface counters** command.

Examples

This example shows how to clear all the interface counters:

```
Switch# clear counters
Clear "show interface" counters on all interfaces [confirm] y
Switch#
```

This example shows how to clear the counters on a specific interface:

```
Switch# clear counters vlan 200
Clear "show interface" counters on this interface [confirm] y
Switch#
```

Related Commands **show interface counters** (refer to Cisco IOS documentation)

clear hw-module slot password

To clear the password on an intelligent line module, use the **clear hw-module slot password** command.

clear hw-module slot *slot_num* **password**

Syntax Description	<i>slot_num</i> Slot on a line module.	
Defaults	The password is not cleared.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.2(18)EW	Support for this command was introduced on the Catalyst 4500 series switch.
Usage Guidelines	You only need to change the password once unless the password is reset.	
Examples	This example shows how to clear the password from slot 5 on a line module: Switch# clear hw-module slot 5 password Switch#	
Related Commands	hw-module power	

clear interface gigabitethernet

To clear the hardware logic from a Gigabit Ethernet IEEE 802.3z interface, use the **clear interface gigabitethernet** command.

clear interface gigabitethernet *slot/port*

Syntax Description	<i>slot/port</i> Number of the slot and port.	
Defaults	This command has no default settings.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
Examples	This example shows how to clear the hardware logic from a Gigabit Ethernet IEEE 802.3z interface: Switch# clear interface gigabitethernet 1/1 Switch#	
Related Commands	show interfaces status	

clear interface vlan

To clear the hardware logic from a VLAN, use the **clear interface vlan** command.

clear interface vlan *number*

Syntax Description	<i>number</i> Number of the VLAN interface; valid values are from 1 to 4094.	
Defaults	This command has no default settings.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
	12.1(12c)EW	Support for extended VLAN addresses added.
Examples	<p>This example shows how to clear the hardware logic from a specific VLAN:</p> <pre>Switch# clear interface vlan 5 Switch#</pre>	
Related Commands	show interfaces status	

clear ip access-template

To clear the statistical information in access lists, use the **clear ip access-template** command.

clear ip access-template *access-list*

Syntax Description	<i>access-list</i> Number of the access list; valid values are from 100 to 199 for an IP extended access list, and from 2000 to 2699 for an expanded range IP extended access list.
---------------------------	---

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	<p>This example shows how to clear the statistical information for an access list:</p> <pre>Switch# clear ip access-template 201 Switch#</pre>
-----------------	--

clear ip arp inspection log

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

clear ip arp inspection log

Syntax Description This command has no arguments or keywords.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Examples This example shows how to clear the contents of the log buffer:

```
Switch# clear ip arp inspection log
Switch#
```

Related Commands

- [arp access-list](#)
- [show ip arp inspection log](#)

clear ip arp inspection statistics

To clear the dynamic ARP inspection statistics, use the **clear ip arp inspection statistics** command.

clear ip arp inspection statistics [**vlan** *vlan-range*]

Syntax Description	vlan <i>vlan-range</i> (Optional) Specifies the VLAN range.
---------------------------	--

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples This example shows how to clear the DAI statistics from VLAN 1 and how to verify the removal:

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

Vlan	Forwarded	Dropped	DHCP Drops	ACL Drops
----	-----	-----	-----	-----
1	0	0	0	0

Vlan	DHCP Permits	ACL Permits	Source MAC Failures
----	-----	-----	-----
1	0	0	0

Vlan	Dest MAC Failures	IP Validation Failures
----	-----	-----
1	0	0

```
Switch#
```

Related Commands	arp access-list clear ip arp inspection log show ip arp inspection
-------------------------	--

clear ip dhcp snooping database

To clear the DHCP binding database, use the **clear ip dhcp snooping database** command.

clear ip dhcp snooping database

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	This example shows how to clear the DHCP binding database:
-----------------	--

```
Switch# clear ip dhcp snooping database
Switch#
```

Related Commands	ip dhcp snooping ip dhcp snooping binding interface (refer to Cisco IOS documentation) ip dhcp snooping information option ip dhcp snooping trust ip dhcp snooping vlan show ip dhcp snooping show ip dhcp snooping binding
-------------------------	---

clear ip dhcp snooping database statistics

To clear the DHCP binding database statistics, use the **clear ip dhcp snooping database statistics** command.

clear ip dhcp snooping database statistics

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	This example shows how to clear the DHCP binding database:
-----------------	--

```
Switch# clear ip dhcp snooping database statistics
Switch#
```

Related Commands	ip dhcp snooping ip dhcp snooping binding ip dhcp snooping information option ip dhcp snooping trust ip dhcp snooping vlan show ip dhcp snooping show ip dhcp snooping binding
-------------------------	--

clear ip igmp group

To delete the IGMP group cache entries, use the **clear ip igmp group** command.

```
clear ip igmp group [{fastethernet slot/port} | {GigabitEthernet slot/port} | {host_name |
group_address} {Loopback interface_number} | {null interface_number} |
{port-channel number} | {vlan vlan_id}]
```

Syntax Description	fastethernet	(Optional) Specifies the Fast Ethernet interface.
	<i>slot/port</i>	(Optional) Number of the slot and port.
	GigabitEthernet	(Optional) Specifies the Gigabit Ethernet interface.
	<i>host_name</i>	(Optional) Hostname, as defined in the DNS hosts table or with the ip host command.
	<i>group_address</i>	(Optional) Address of the multicast group in four-part, dotted notation.
	Loopback <i>interface_number</i>	(Optional) Specifies the loopback interface; valid values are from 0 to 2,147,483,647.
	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 from 1 to 64.
	vlan <i>vlan_id</i>	(Optional) Specifies the VLAN; valid values are from 1 to 4094.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Usage Guidelines The IGMP cache contains a list of the multicast groups of which hosts on the directly connected LAN are members.

To delete all the entries from the IGMP cache, enter the **clear ip igmp group** command with no arguments.

Examples This example shows how to clear the entries for a specific group from the IGMP cache:

```
Switch# clear ip igmp group 224.0.255.1
Switch#
```


This example shows how to clear the IGMP group cache entries from a specific interface:

```
Switch# clear ip igmp group gigabitethernet 2/2
Switch#
```

Related Commands

ip host (refer to Cisco IOS documentation)

show ip igmp groups (refer to Cisco IOS documentation)

show ip igmp interface

clear ip igmp snooping membership

To clear the explicit host tracking database, use the **clear ip igmp snooping membership** command.

clear ip igmp snooping membership [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.	
Defaults	This command has no default settings.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.1(20)EW	Support for this command was introduced on the Catalyst 4500 series switch.
Usage Guidelines	By default, the explicit host tracking database maintains a maximum of 1-KB entries. After you reach this limit, no additional entries can be created in the database. To create more entries, you will need to delete the database with the clear ip igmp snooping statistics vlan command.	
Examples	<p>This example shows how to display the IGMP snooping statistics for VLAN 25:</p> <pre>Switch# clear ip igmp snooping membership vlan 25 Switch#</pre>	
Related Commands	ip igmp snooping vlan explicit-tracking show ip igmp snooping membership	

clear ip mfib counters

To clear the global MFIB counters and the counters for all active MFIB routes, use the **clear ip mfib counters** command.

clear ip mfib counters

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	This example shows how to clear all the active MFIB routes and global counters:
-----------------	---

```
Switch# clear ip mfib counters
Switch#
```

Related Commands	show ip mfib
-------------------------	------------------------------

clear ip mfib fastdrop

To clear all the MFIB fast-drop entries, use the **clear ip mfib fastdrop** command.

clear ip mfib fastdrop

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Usage Guidelines	If new fast-dropped packets arrive, the new fast-drop entries are created.
-------------------------	--

Examples	This example shows how to clear all the fast-drop entries:
-----------------	--

```
Switch# clear ip mfib fastdrop
Switch#
```

Related Commands	ip mfib fastdrop show ip mfib fastdrop
-------------------------	---

clear lacp counters

To clear the statistics for all the interfaces belonging to a specific channel group, use the **clear lacp counters** command.

clear lacp [*channel-group*] **counters**

Syntax Description	<i>channel-group</i> (Optional) Channel-group number; valid values are from 1 to 64.
--------------------	--

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

Command Modes	Privileged EXEC mode
---------------	----------------------

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

Usage Guidelines	<p>This command is not supported on systems that are configured with a Supervisor Engine I.</p> <p>If you do not specify a channel group, all channel groups are cleared.</p> <p>If you enter this command for a channel group that contains members in PAgP mode, the command is ignored.</p>
------------------	--

Examples	<p>This example shows how to clear the statistics for a specific group:</p> <pre>Switch# clear lacp 1 counters Switch#</pre>
----------	--

Related Commands	show lacp
------------------	---------------------------

clear mac-address-table dynamic

To clear the dynamic address entries from the Layer 2 MAC address table, use the **clear mac-address-table dynamic** command.

clear mac-address-table dynamic [{**address** *mac_addr*} | {**interface** *interface*}] [**vlan** *vlan_id*]

Syntax Description	address <i>mac_addr</i>	(Optional) Specifies the MAC address.
	interface <i>interface</i>	(Optional) Specifies the interface and clears the entries associated with it; valid values are FastEthernet and GigabitEthernet .
	vlan <i>vlan_id</i>	(Optional) Specifies the VLANs; valid values are from 1 to 4094.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Usage Guidelines Enter the **clear mac-address-table dynamic** command with no arguments to remove all dynamic entries from the table.

Examples This example shows how to clear all the dynamic Layer 2 entries for a specific interface (gi1/1):

```
Switch# clear mac-address-table dynamic interface gi1/1
Switch#
```

Related Commands

- [mac-address-table aging-time](#)
- [main-cpu](#)
- [show mac-address-table address](#)

clear pagp

To clear the port-channel information, use the **clear pagp** command.

clear pagp {*group-number* | **counters**}

Syntax Description	<i>group-number</i>	Channel-group number; valid values are from 1 to 64.
	counters	Clears traffic filters.

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Examples	This example shows how to clear the port-channel information for a specific group:
----------	--

```
Switch# clear pagp 32
Switch#
```

This example shows how to clear all the port-channel traffic filters:

```
Switch# clear pagp counters
Switch#
```

Related Commands	show pagp
------------------	---------------------------

clear port-security

To delete all configured secure addresses or a specific dynamic or sticky secure address on an interface from the MAC address table, use the **clear port-security** command.

clear port-security {**all** | **dynamic**} [**address** *mac-addr* [**vlan** *vlan-id*]] | [**interface** *interface-id*]

Syntax Description

all	Deletes all the secure MAC addresses.
dynamic	Deletes all the dynamic secure MAC addresses.
address <i>mac-addr</i>	(Optional) Deletes the specified secure MAC address.
vlan <i>vlan-id</i>	(Optional) Deletes the specified secure MAC address from the specified VLAN.
interface <i>interface-id</i>	(Optional) Deletes the secure MAC addresses on the specified physical port or port channel.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Usage Guidelines

If you enter the **clear port-security all** command, the switch removes all the secure MAC addresses from the MAC address table.

If you enter the **clear port-security dynamic interface interface-id** command, the switch removes all the dynamic secure MAC addresses on an interface from the MAC address table.

Command History

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

Examples

This example shows how to remove all the secure addresses from the MAC address table:

```
Switch# clear port-security all
```

This example shows how to remove a dynamic secure address from the MAC address table:

```
Switch# clear port-security dynamic address 0008.0070.0007
```

This example shows how to remove all the dynamic secure addresses learned on a specific interface:

```
Switch# clear port-security dynamic interface gigabitethernet0/1
```

You can verify that the information was deleted by entering the **show port-security** command.

Related Commands

[show port-security](#)
[switchport port-security](#)

clear qos

To clear the global and per-interface aggregate QoS counters, use the **clear qos** command.

```
clear qos [aggregate-policer name] | interface { {fastethernet | GigabitEthernet}
{slot/interface} } | vlan {vlan_num} | port-channel {number}}
```

Syntax Description

aggregate-policer <i>name</i>	(Optional) Specifies an aggregate policer.
interface	(Optional) Specifies an interface.
fastethernet	(Optional) Specifies the Fast Ethernet 802.3 interface.
GigabitEthernet	(Optional) Specifies the Gigabit Ethernet 802.3z interface.
<i>slot/interface</i>	(Optional) Number of the slot and interface.
vlan <i>vlan_num</i>	(Optional) Specifies a VLAN.
port-channel <i>number</i>	(Optional) Specifies the channel interface; valid values are from 1 to 64.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines



Note

When you enter the **clear qos** command, the way that the counters work is affected and the traffic that is normally restricted could be forwarded for a short period of time.

The **clear qos** command resets the interface QoS policy counters. If no interface is specified, the **clear qos** command resets the QoS policy counters for all interfaces.

Examples

This example shows how to clear the global and per-interface aggregate QoS counters for all the protocols:

```
Switch# clear qos
Switch#
```

This example shows how to clear the specific protocol aggregate QoS counters for all the interfaces:

```
Switch# clear qos aggregate-policer
Switch#
```

Related Commands

[show qos](#)

clear vlan counters

To clear the software-cached counter values to start from zero again for a specified VLAN or all existing VLANs, use the **clear vlan counters** command.

clear vlan [*vlan-id*] **counters**

Syntax Description	<i>vlan-id</i> (Optional) VLAN number; see the “Usage Guidelines” section for valid values.	
Defaults	This command has no default settings.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.1(13)EW	Support for this command was introduced on the Catalyst 4500 series switches.
Usage Guidelines	If you do not specify a <i>vlan-id</i> value; the software-cached counter values for all the existing VLANs are cleared.	
Examples	<p>This example shows how to clear the software-cached counter values for a specific VLAN:</p> <pre>Switch# clear vlan 10 counters Clear "show vlan" counters on this vlan [confirm]y Switch#</pre>	
Related Commands	show vlan counters	

clear vmps statistics

To clear the VMPS statistics, use the **clear vmps statistics** command.

clear vmps statistics

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	This example shows how to clear the VMPS statistics:
-----------------	--

Switch# clear vmps statistics Switch#

Related Commands	show vmps vmps reconfirm (privileged EXEC)
-------------------------	---

debug adjacency

To display information about the adjacency debugging, use the **debug adjacency** command. To disable debugging output, use the **no** form of this command.

debug adjacency [ipc]

no debug adjacency

Syntax Description	ipc (Optional) Displays the IPC entries in the adjacency database.
--------------------	---

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Examples	This example shows how to display the information in the adjacency database:
----------	--

```
Switch# debug adjacency
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
4d02h: ADJ: add 172.20.52.36 (GigabitEthernet1/1) via ARP will expire: 04:00:00
<... output truncated...>
Switch#
```

Related Commands	undebug adjacency (same as no debug adjacency)
------------------	---

debug backup

To debug the backup events, use the **debug backup** command. To disable the debugging output, use the **no** form of this command.

debug backup

no debug backup

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	<p>This example shows how to debug the backup events:</p> <pre>Switch# debug backup Backup events debugging is on Switch#</pre>
-----------------	---

Related Commands	undebug backup (same as no debug backup)
-------------------------	---

debug condition interface

To limit the debugging output of interface-related activities, use the **debug condition interface** command. To disable the debugging output, use the **no** form of this command.

debug condition interface {**fastethernet** *slot/port* | **GigabitEthernet** *slot/port* |
null *interface_num* | **port-channel** *interface-num* | **vlan** *vlan_id*}

no debug condition interface {**fastethernet** *slot/port* | **GigabitEthernet** *slot/port* | **null**
interface_num | **port-channel** *interface-num* | **vlan** *vlan_id*}

Syntax Description	fastethernet	Limits the debugging to Fast Ethernet interfaces.
	<i>slot/port</i>	Number of the slot and port.
	GigabitEthernet	Limits the debugging to Gigabit Ethernet interfaces.
	null <i>interface-num</i>	Limits the debugging to null interfaces; the valid value is 0.
	port-channel <i>interface-num</i>	Limits the debugging to port-channel interfaces; valid values are from 1 to 64.
	vlan <i>vlan_id</i>	Specifies the VLAN interface number; valid values are from 1 to 4094.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Examples This example shows how to limit the debugging output to VLAN interface 1:

```
Switch# debug condition interface vlan 1
Condition 2 set
Switch#
```

Related Commands [debug interface](#)
undebug condition interface (same as **no debug condition interface**)

debug condition standby

To limit the debugging output for the standby state changes, use the **debug condition standby** command. To disable the debugging output, use the **no** form of this command.

debug condition standby {**fastethernet** *slot/port* | **GigabitEthernet** *slot/port* |
port-channel *interface-num* | **vlan** *vlan_id* *group-number*}

no debug condition standby {**fastethernet** *slot/port* | **GigabitEthernet** *slot/port* |
port-channel *interface-num* | **vlan** *vlan_id* *group-number*}

Syntax Description	fastethernet	Limits the debugging to Fast Ethernet interfaces.
	<i>slot/port</i>	Number of the slot and port.
	GigabitEthernet	Limits the debugging to Gigabit Ethernet interfaces.
	port-channel <i>interface_num</i>	Limits the debugging output to port-channel interfaces; valid values are from 1 to 64.
	vlan <i>vlan_id</i>	Limits the debugging of a condition on a VLAN interface; valid values are from 1 to 4094.
	<i>group-number</i>	VLAN group number; valid values are from 0 to 255.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Usage Guidelines If you attempt to remove the only condition set, you will be prompted with a message asking if you want to abort the removal operation. You can enter **n** to abort the removal or **y** to proceed with the removal. If you remove the only condition set, an excessive number of debugging messages might occur.

Examples This example shows how to limit the debugging output to group 0 in VLAN 1:

```
Switch# debug condition standby vlan 1 0
Condition 3 set
Switch#
```

This example shows the display if you try to turn off the last standby debug condition:

```
Switch# no debug condition standby vlan 1 0
This condition is the last standby condition set.
Removing all conditions may cause a flood of debugging
messages to result, unless specific debugging flags
```

debug condition standby

are first removed.

```
Proceed with removal? [yes/no]: n
% Operation aborted
Switch#
```

Related Commands **undebbug condition standby** (same as **no debug condition standby**)

debug condition vlan

To limit the VLAN debugging output for a specific VLAN, use the **debug condition vlan** command. To disable the debugging output, use the **no** form of this command.

debug condition vlan {vlan_id}

no debug condition vlan {vlan_id}

Syntax Description	vlan_id Number of the VLAN; valid values are from 1 to 4096.	
Defaults	This command has no default settings.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
	12.1(12c)EW	Support for extended VLAN addresses added.
Usage Guidelines	If you attempt to remove the only VLAN condition set, you will be prompted with a message asking if you want to abort the removal operation. You can enter n to abort the removal or y to proceed with the removal. If you remove the only condition set, it could result in the display of an excessive number of messages.	
Examples	This example shows how to limit the debugging output to VLAN 1: Switch# debug condition vlan 1 Condition 4 set Switch#	
	This example shows the message that is displayed when you attempt to disable the last VLAN debug condition: Switch# no debug condition vlan 1 This condition is the last vlan condition set. Removing all conditions may cause a flood of debugging messages to result, unless specific debugging flags are first removed. Proceed with removal? [yes/no]: n % Operation aborted Switch#	
Related Commands	undebug condition vlan (same as no debug condition vlan)	

debug dot1x

To enable the debugging for the 802.1X feature, use the **debug dot1x** command. To disable the debugging output, use the **no** form of this command.

debug dot1x { **all** | **errors** | **events** | **packets** | **registry** | **state-machine** }

no debug dot1x { **all** | **errors** | **events** | **packets** | **registry** | **state-machine** }

Syntax Description

all	Enables the debugging of all conditions.
errors	Enables the debugging of print statements guarded by the dot1x error flag.
events	Enables the debugging of print statements guarded by the dot1x events flag.
packets	All incoming dot1x packets are printed with packet and interface information.
registry	Enables the debugging of print statements guarded by the dot1x registry flag.
state-machine	Enables the debugging of print statements guarded by the dot1x registry flag.

Defaults

Debugging is disabled.

Command Modes

Privileged EXEC

Command History

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

Examples

This example shows how to enable the 802.1X debugging for all conditions:

```
Switch# debug dot1x all
Switch#
```

Related Commands

[show dot1x](#)
undebug dot1x (same as **no debug dot1x**)

debug etherchnl

To debug EtherChannel, use the **debug etherchnl** command. To disable the debugging output, use the **no** form of this command.

debug etherchnl [**all** | **detail** | **error** | **event** | **idb** | **linecard**]

no debug etherchnl

Syntax Description	all	(Optional) Displays all EtherChannel debug messages.
	detail	(Optional) Displays the detailed EtherChannel debug messages.
	error	(Optional) Displays the EtherChannel error messages.
	event	(Optional) Debugs the major EtherChannel event messages.
	idb	(Optional) Debugs the PAgP IDB messages.
	linecard	(Optional) Debugs the SCP messages to the module.

Defaults

The default settings are as follows:

- Debug is disabled.
- All messages are displayed.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

If you do not specify a keyword, all debug messages are displayed.

Examples

This example shows how to display all the EtherChannel debug messages:

```
Switch# debug etherchnl
PAgP Shim/FEC debugging is on
22:46:30:FEC:returning agport Po15 for port (Fa2/1)
22:46:31:FEC:returning agport Po15 for port (Fa4/14)
22:46:33:FEC:comparing GC values of Fa2/25 Fa2/15 flag = 1 1
22:46:33:FEC:port_attrib:Fa2/25 Fa2/15 same
22:46:33:FEC:EC - attrib incompatable for Fa2/25; duplex of Fa2/25 is half, Fa2/15 is full
22:46:33:FEC:pagp_switch_choose_unique:Fa2/25, port Fa2/15 in agport Po3 is incompatable
Switch#
```

This example shows how to display the EtherChannel IDB debug messages:

```
Switch# debug etherchnl idb
Agport idb related debugging is on
Switch#
```

■ debug etherchnl

This example shows how to disable the debugging:

```
Switch# no debug etherchnl  
Switch#
```

Related Commands **undebug etherchnl** (same as **no debug etherchnl**)

debug interface

To abbreviate the entry of the **debug condition interface** command, use the **debug interface** command. To disable debugging output, use the **no** form of this command.

```
debug interface { FastEthernet slot/port | GigabitEthernet slot/port | null |
port-channel interface-num | vlan vlan_id }
```

```
no debug interface { FastEthernet slot/port | GigabitEthernet slot/port | null |
port-channel interface-num | vlan vlan_id }
```

Syntax Description		
FastEthernet		Limits the debugging to Fast Ethernet interfaces.
<i>slot/port</i>		Number of the slot and port.
GigabitEthernet		Limits the debugging to Gigabit Ethernet interfaces.
null		Limits the debugging to null interfaces; the only valid value is 0.
port-channel <i>interface-num</i>		Limits the debugging to port-channel interfaces; valid values are from 1 to 64.
vlan <i>vlan_id</i>		Specifies the VLAN interface number; valid values are from 1 to 4094.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Examples This example shows how to limit the debugging to interface VLAN 1:

```
Switch# debug interface vlan 1
Condition 1 set
Switch#
```

Related Commands [debug condition interface](#)
undebug interface (same as **no debug interface**)

debug ipc

To debug the IPC activity, use the **debug ipc** command. To disable the debugging output, use the **no** form of this command.

debug ipc { **all** | **errors** | **events** | **headers** | **packets** | **ports** | **seats** }

no debug ipc { **all** | **errors** | **events** | **headers** | **packets** | **ports** | **seats** }

Syntax Description

all	Enables all IPC debugging.
errors	Enables the IPC error debugging.
events	Enables the IPC event debugging.
headers	Enables the IPC header debugging.
packets	Enables the IPC packet debugging.
ports	Enables the debugging of the creation and deletion of ports.
seats	Enables the debugging of the creation and deletion of nodes.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

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

Examples

This example shows how to enable the debugging of the IPC events:

```
Switch# debug ipc events
Special Events debugging is on
Switch#
```

Related Commands

undebg ipc (same as **no debug ipc**)

debug ip dhcp snooping event

To debug the DHCP snooping events, use the **debug ip dhcp snooping event** command. To disable debugging output, use the **no** form of this command.

debug ip dhcp snooping event

no debug ip dhcp snooping event

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

Defaults	Debugging of snooping event is disabled.
-----------------	--

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	This example shows how to enable the debugging for the DHCP snooping events:
-----------------	--

```
Switch# debug ip dhcp snooping event
Switch#
```

This example shows how to disable the debugging for the DHCP snooping events:

```
Switch# no debug ip dhcp snooping event
Switch#
```

Related Commands	debug ip dhcp snooping packet
-------------------------	---

debug ip dhcp snooping packet

To debug the DHCP snooping messages, use the **debug ip dhcp snooping packet** command. To disable the debugging output, use the **no** form of this command.

debug ip dhcp snooping packet

no debug ip dhcp snooping packet

Syntax Description This command has no arguments or keywords.

Defaults Debugging of snooping packet is disabled.

Command Modes Privileged EXEC

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

Examples This example shows how to enable the debugging for the DHCP snooping packets:

```
Switch# debug ip dhcp snooping packet
Switch#
```

This example shows how to disable the debugging for the DHCP snooping packets:

```
Switch# no debug ip dhcp snooping packet
Switch#
```

Related Commands [debug ip dhcp snooping event](#)

debug ip verify source packet

To debug the IP source guard messages, use the **debug ip verify source packet** command. To disable the debugging output, use the **no** form of this command.

debug ip verify source packet

no debug ip verify source packet

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

Defaults	Debugging of snooping security packets is disabled.
-----------------	---

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	This example shows how to enable debugging for the IP source guard:
-----------------	---

```
Switch# debug ip verify source packet
Switch#
```

This example shows how to disable debugging for the IP source guard:
--

```
Switch# no debug ip verify source packet
Switch#
```

Related Commands	ip dhcp snooping ip dhcp snooping information option ip dhcp snooping limit rate ip dhcp snooping trust ip verify source vlan dhcp-snooping (refer to Cisco IOS documentation) show ip dhcp snooping show ip dhcp snooping binding show ip verify source (refer to Cisco IOS documentation)
-------------------------	--

debug lacp

To debug the LACP activity, use the **debug lacp** command. To disable the debugging output, use the **no** form of this command.

debug lacp [**all** | **event** | **fsm** | **misc** | **packet**]

no debug lacp

Syntax Description	all	(Optional) Enables all LACP debugging.
	event	(Optional) Enables the debugging of the LACP events.
	fsm	(Optional) Enables the debugging of the LACP finite state machine.
	misc	(Optional) Enables the miscellaneous LACP debugging.
	packet	(Optional) Enables the LACP packet debugging.

Defaults	Debugging of LACP activity is disabled.
----------	---

Command Modes	Privileged EXEC
---------------	-----------------

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

Usage Guidelines	This command is supported only by the supervisor engine and can be entered only from the Catalyst 4500 series switch console.
------------------	---

Examples	This example shows how to enable the LACP miscellaneous debugging:
----------	--

```
Switch# debug lacp
Port Aggregation Protocol Miscellaneous debugging is on
Switch#
```

Related Commands	undebug pagp (same as no debug pagp)
------------------	---

debug monitor

To display the monitoring activity, use the **debug monitor** command. To disable the debugging output, use the **no** form of this command.

debug monitor { **all** | **errors** | **idb-update** | **list** | **notifications** | **platform** | **requests** }

no debug monitor { **all** | **errors** | **idb-update** | **list** | **notifications** | **platform** | **requests** }

Syntax Description	all	Displays all the SPAN debugging messages.
	errors	Displays the SPAN error details.
	idb-update	Displays the SPAN IDB update traces.
	list	Displays the SPAN list tracing and the VLAN list tracing.
	notifications	Displays the SPAN notifications.
	platform	Displays the SPAN platform tracing.
	requests	Displays the SPAN requests.

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Examples	This example shows how to debug the monitoring errors:
----------	--

```
Switch# debug monitor errors
SPAN error detail debugging is on
Switch#
```

Related Commands	undebug monitor (same as no debug monitor)
------------------	---

debug nvram

To debug the NVRAM activity, use the **debug nvram** command. To disable the debugging output, use the **no** form of this command.

debug nvram

no debug nvram

Syntax Description This command has no arguments or keywords.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Examples This example shows how to debug NVRAM:

```
Switch# debug nvram
NVRAM behavior debugging is on
Switch#
```

Related Commands **undebug nvram** (same as **no debug nvram**)

debug pagp

To debug the PAgP activity, use the **debug pagp** command. To disable the debugging output, use the **no** form of this command.

debug pagp [**all** | **event** | **fsm** | **misc** | **packet**]

no debug pagp

Syntax Description	all	(Optional) Enables all PAgP debugging.
	event	(Optional) Enables the debugging of the PAgP events.
	fsm	(Optional) Enables the debugging of the PAgP finite state machine.
	misc	(Optional) Enables the miscellaneous PAgP debugging.
	packet	(Optional) Enables the PAgP packet debugging.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Usage Guidelines This command is supported only by the supervisor engine and can be entered only from the Catalyst 4500 series switch console.

Examples This example shows how to enable the PAgP miscellaneous debugging:

```
Switch# debug pagp misc
Port Aggregation Protocol Miscellaneous debugging is on
Switch#
*Sep 30 10:13:03: SP: PAgP: pagp_h(Fa5/6) expired
*Sep 30 10:13:03: SP: PAgP: 135 bytes out Fa5/6
*Sep 30 10:13:03: SP: PAgP: Fa5/6 Transmitting information packet
*Sep 30 10:13:03: SP: PAgP: timer pagp_h(Fa5/6) started with interval 30000
<... output truncated...>
Switch#
```

Related Commands **undebug pagp** (same as **no debug pagp**)

debug platform packet protocol lacp

To debug the LACP protocol packets, use the **debug platform packet protocol lacp** command. To disable the debugging output, use the **no** form of this command.

debug platform packet protocol lacp [receive | transmit | vlan]

no debug platform packet protocol lacp [receive | transmit | vlan]

Syntax Description	receive	(Optional) Enables the platform packet reception debugging functions.
	transmit	(Optional) Enables the platform packet transmission debugging functions.
	vlan	(Optional) Enables the platform packet VLAN debugging functions.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Examples This example shows how to enable all PM debugging:

```
Switch# debug platform packet protocol lacp
Switch#
```

Related Commands **undebug platform packet protocol lacp** (same as **no debug platform packet protocol lacp**)

debug platform packet protocol pagp

To debug the PAgP protocol packets, use the **debug platform packet protocol pagp** command. To disable the debugging output, use the **no** form of this command.

debug platform packet protocol pagp [receive | transmit | vlan]

no debug platform packet protocol pagp [receive | transmit | vlan]

Syntax Description	receive	(Optional) Enables the platform packet reception debugging functions.
	transmit	(Optional) Enables the platform packet transmission debugging functions.
	vlan	(Optional) Enables the platform packet VLAN debugging functions.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Examples This example shows how to enable all PM debugging:

```
Switch# debug platform packet protocol pagp
Switch#
```

Related Commands **undebg platform packet protocol pagp** (same as **no debug platform packet protocol pagp**)

debug pm

To debug the port manager (PM) activity, use the **debug pm** command. To disable the debugging output, use the **no** form of this command.

debug pm { **all** | **card** | **cookies** | **etherchnl** | **messages** | **port** | **registry** | **scp** | **sm** | **span** | **split** | **vlan** | **vp** }

no debug pm { **all** | **card** | **cookies** | **etherchnl** | **messages** | **port** | **registry** | **scp** | **sm** | **span** | **split** | **vlan** | **vp** }

Syntax Description

all	Displays all PM debugging messages.
card	Debugs the module-related events.
cookies	Enables the internal PM cookie validation.
etherchnl	Debugs the EtherChannel-related events.
messages	Debugs the PM messages.
port	Debugs the port-related events.
registry	Debugs the PM registry invocations.
scp	Debugs the SCP module messaging.
sm	Debugs the state machine-related events.
span	Debugs the spanning-tree-related events.
split	Debugs the split-processor.
vlan	Debugs the VLAN-related events.
vp	Debugs the virtual port-related events.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

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

Examples

This example shows how to enable all PM debugging:

```
Switch# debug pm all
Switch#
```

Related Commands

undebbug pm (same as **no debug pm**)

debug psecure

To debug port security, use the **debug psecure** command. To disable the debugging output, use the **no** form of this command.

debug psecure

no debug psecure

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	<p>This example shows how to enable all PM debugging:</p> <pre>Switch# debug psecure Switch#</pre>
-----------------	--

Related Commands	switchport port-security
-------------------------	--

debug redundancy

To debug the supervisor engine redundancy, use the **debug redundancy** command. To disable the debugging output, use the **no** form of this command.

debug redundancy {errors | fsm | kpa | msg | progression | status | timer}

no debug redundancy

Syntax Description

errors	Enables the redundancy facility for error debugging.
fsm	Enables the redundancy facility for FSM event debugging.
kpa	Enables the redundancy facility for keepalive debugging.
msg	Enables the redundancy facility for messaging event debugging.
progression	Enables the redundancy facility for progression event debugging.
status	Enables the redundancy facility for status event debugging.
timer	Enables the redundancy facility for timer event debugging.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(12c)EW	Support for this command was introduced on the Catalyst 4500 series switch (Catalyst 4507R only).

Examples

This example shows how to debug the redundancy facility timer event debugging:

```
Switch# debug redundancy timer
Redundancy timer debugging is on
Switch#
```

debug smf updates

To debug the software MAC filter (SMF) address insertions and deletions, use the **debug smf updates** command. To disable the debugging output, use the **no** form of this command.

debug smf updates

no debug smf updates

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

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

Command Modes	Privileged EXEC
----------------------	-----------------

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

Examples	<p>This example shows how to debug the SMF updates:</p> <pre>Switch# debug smf updates Software MAC filter address insertions and deletions debugging is on Switch#</pre>
-----------------	---

Related Commands	undebug smf (same as no debug smf)
-------------------------	---

debug spanning-tree

To debug the spanning-tree activities, use the **debug spanning-tree** command. To disable the debugging output, use the **no** form of this command.

debug spanning-tree { **all** | **bpdu** | **bpdu-opt** | **etherchannel** | **config** | **events** | **exceptions** | **general** | **mst** | **pvst+** | **root** | **snmp** }

no debug spanning-tree { **all** | **bpdu** | **bpdu-opt** | **etherchannel** | **config** | **events** | **exceptions** | **general** | **mst** | **pvst+** | **root** | **snmp** }

Syntax Description

all	Displays all the spanning-tree debugging messages.
bpdu	Debugs the spanning-tree BPDU.
bpdu-opt	Debugs the optimized BPDU handling.
etherchannel	Debugs the spanning-tree EtherChannel support.
config	Debugs the spanning-tree configuration changes.
events	Debugs the TCAM events.
exceptions	Debugs the spanning-tree exceptions.
general	Debugs the general spanning-tree activity.
mst	Debugs the multiple spanning-tree events.
pvst+	Debugs the PVST+ events.
root	Debugs the spanning-tree root events.
snmp	Debugs the spanning-tree SNMP events.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

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

Examples

This example shows how to debug the spanning-tree PVST+:

```
Switch# debug spanning-tree pvst+
Spanning Tree PVST+ debugging is on
Switch#
```

Related Commands

undebg spanning-tree (same as **no debug spanning-tree**)

debug spanning-tree backbonefast

To enable debugging of the spanning-tree BackboneFast events, use the **debug spanning-tree backbonefast** command. To disable the debugging output, use the **no** form of this command.

debug spanning-tree backbonefast [**detail** | **exceptions**]

no debug spanning-tree backbonefast

Syntax Description	detail	(Optional) Displays the detailed BackboneFast debugging messages.
	exceptions	(Optional) Enables the debugging of spanning-tree BackboneFast exceptions.
Defaults	This command has no default settings.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
Usage Guidelines	This command is supported only by the supervisor engine and can be entered only from the Catalyst 4500 series switch console.	
Examples	This example shows how to enable the debugging and to display the detailed spanning-tree BackboneFast debugging information: Switch# debug spanning-tree backbonefast detail Spanning Tree backbonefast detail debugging is on Switch#	
Related Commands	undebug spanning-tree backbonefast (same as no debug spanning-tree backbonefast)	

debug spanning-tree switch

To enable the switch shim debugging, use the **debug spanning-tree switch** command. To disable the debugging output, use the **no** form of this command.

debug spanning-tree switch { **all** | **errors** | **general** | **pm** | **rx** { **decode** | **errors** | **interrupt** | **process** } | **state** | **tx** [**decode**] }

no debug spanning-tree switch { **all** | **errors** | **general** | **pm** | **rx** { **decode** | **errors** | **interrupt** | **process** } | **state** | **tx** [**decode**] }

Syntax Description	all	Displays all the spanning-tree switch shim debugging messages.
	errors	Enables the debugging of switch shim errors or exceptions.
	general	Enables the debugging of general events.
	pm	Enables the debugging of port manager events.
	rx	Displays the received BPDU-handling debugging messages.
	decode	Enables the debugging of the decode-received packets of the spanning-tree switch shim.
	errors	Enables the debugging of the receive errors of the spanning-tree switch shim.
	interrupt	Enables the shim ISR receive BPDU debugging on the spanning-tree switch.
	process	Enables the process receive BPDU debugging on the spanning-tree switch.
	state	Enables the debugging of the state changes on the spanning-tree port.
	tx	Enables the transmit BPDU debugging on the spanning-tree switch shim.
	decode	(Optional) Enables the decode-transmitted packets debugging on the spanning-tree switch shim.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Usage Guidelines This command is supported only by the supervisor engine and can be entered only from the switch console.

Examples

This example shows how to enable the transmit BPDU debugging on the spanning-tree switch shim:

```
Switch# debug spanning-tree switch tx
Spanning Tree Switch Shim transmit bpdu debugging is on
*Sep 30 08:47:33: SP: STP SW: TX: bpdu of type ieee-st size 92 on FastEthernet5/9 303
*Sep 30 08:47:33: SP: STP SW: TX: bpdu of type ieee-st size 92 on FastEthernet5/9 304
*Sep 30 08:47:33: SP: STP SW: TX: bpdu of type ieee-st size 92 on FastEthernet5/9 305
*Sep 30 08:47:33: SP: STP SW: TX: bpdu of type ieee-st size 92 on FastEthernet5/9 349
*Sep 30 08:47:33: SP: STP SW: TX: bpdu of type ieee-st size 92 on FastEthernet5/9 350
*Sep 30 08:47:33: SP: STP SW: TX: bpdu of type ieee-st size 92 on FastEthernet5/9 351
*Sep 30 08:47:33: SP: STP SW: TX: bpdu of type ieee-st size 92 on FastEthernet5/9 801
<... output truncated...>
Switch#
```

Related Commands

undebg spanning-tree switch (same as **no debug spanning-tree switch**)

debug spanning-tree uplinkfast

To enable the debugging of the spanning-tree UplinkFast events, use the **debug spanning-tree uplinkfast** command. To disable the debugging output, use the **no** form of this command.

debug spanning-tree uplinkfast [exceptions]

no debug spanning-tree uplinkfast

Syntax Description	exceptions (Optional) Enables the debugging of the spanning-tree UplinkFast exceptions.	
Defaults	This command has no default settings.	
Command Modes	Privileged EXEC	
Command History	Release	Modification
	12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
Usage Guidelines	This command is supported only by the supervisor engine and can be entered only from the switch console.	
Examples	<p>This example shows how to debug the spanning-tree UplinkFast exceptions:</p> <pre>Switch# debug spanning-tree uplinkfast exceptions Spanning Tree uplinkfast exceptions debugging is on Switch#</pre>	
Related Commands	undebug spanning-tree uplinkfast (same as no debug spanning-tree uplinkfast)	

debug sw-vlan

To debug the VLAN manager activities, use the **debug sw-vlan** command. To disable the debugging output, use the **no** form of this command.

debug sw-vlan {badpmcookies | events | management | packets | registries}

no debug sw-vlan {badpmcookies | events | management | packets | registries}

Syntax Description	badpmcookies	Displays the VLAN manager incidents of bad port-manager cookies.
	events	Debugs the VLAN manager events.
	management	Debugs the VLAN manager management of internal VLANs.
	packets	Debugs the packet handling and encapsulation processes.
	registries	Debugs the VLAN manager registries.

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Examples	This example shows how to debug the software VLAN events:
----------	---

```
Switch# debug sw-vlan events
vlan manager events debugging is on
Switch#
```

Related Commands	undebg sw-vlan (same as no debug sw-vlan)
------------------	--

debug sw-vlan ifs

To enable the VLAN manager Cisco IOS file system (IFS) error tests, use the **debug sw-vlan ifs** command. To disable the debugging output, use the **no** form of this command.

debug sw-vlan ifs {open {read | write} | read {1 | 2 | 3 | 4} | write}

no debug sw-vlan ifs {open {read | write} | read {1 | 2 | 3 | 4} | write}

Syntax Description	open	Enables the VLAN manager IFS debugging of errors in an IFS file-open operation.
	read	Debugs the errors that occurred when the IFS VLAN configuration file was open for reading.
	write	Debugs the errors that occurred when the IFS VLAN configuration file was open for writing.
	{1 2 3 4}	Determines the file-read operation. See the “Usage Guidelines” section for information about operation levels.
	write	Debugs the errors that occurred during an IFS file-write operation.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Usage Guidelines The following are four types of file read operations:

- Operation **1**—Reads the file header, which contains the header verification word and the file version number.
- Operation **2**—Reads the main body of the file, which contains most of the domain and VLAN information.
- Operation **3**—Reads TLV descriptor structures.
- Operation **4**—Reads TLV data.

Examples This example shows how to debug the TLV data errors during a file-read operation:

```
Switch# debug sw-vlan ifs read 4
vlan manager ifs read # 4 errors debugging is on
Switch#
```

Related Commands **undebg sw-vlan ifs** (same as **no debug sw-vlan ifs**)

debug sw-vlan notification

To enable the debugging of the messages that trace the activation and deactivation of the ISL VLAN IDs, use the **debug sw-vlan notification** command. To disable the debugging output, use the **no** form of this command.

debug sw-vlan notification { accfwdchange | allowedvlanfgchange | fwdchange | linkchange | modechange | pruningcfgchange | statechange }

no debug sw-vlan notification { accfwdchange | allowedvlanfgchange | fwdchange | linkchange | modechange | pruningcfgchange | statechange }

Syntax Description	accfwdchange	Enables the VLAN manager notification of aggregated access interface STP forward changes.
	allowedvlanfgchange	Enables the VLAN manager notification of changes to allowed VLAN configuration.
	fwdchange	Enables the VLAN manager notification of STP forwarding changes.
	linkchange	Enables the VLAN manager notification of interface link state changes.
	modechange	Enables the VLAN manager notification of interface mode changes.
	pruningcfgchange	Enables the VLAN manager notification of changes to pruning configuration.
	statechange	Enables the VLAN manager notification of interface state changes.

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Examples	<p>This example shows how to debug the software VLAN interface mode change notifications:</p> <pre>Switch# debug sw-vlan notification modechange vlan manager port mode change notification debugging is on Switch#</pre>
----------	---

Related Commands	undebug sw-vlan notification (same as no debug sw-vlan notification)
------------------	---

debug sw-vlan vtp

To enable the debugging of messages to be generated by the VTP protocol code, use the **debug sw-vlan vtp** command. To disable the debugging output, use the **no** form of this command.

debug sw-vlan vtp { events | packets | pruning [packets | xmit] | xmit }

no debug sw-vlan vtp { events | packets | pruning [packets | xmit] | xmit }

Syntax Description

events	Displays the general-purpose logic flow and detailed VTP debugging messages generated by the VTP_LOG_RUNTIME macro in the VTP code.
packets	Displays the contents of all incoming VTP packets that have been passed into the VTP code from the Cisco IOS VTP platform-dependent layer, except for pruning packets.
pruning	Enables the debugging message to be generated by the pruning segment of the VTP protocol code.
packets	(Optional) Displays the contents of all incoming VTP pruning packets that have been passed into the VTP code from the Cisco IOS VTP platform-dependent layer.
xmit	(Optional) Displays the contents of all outgoing VTP packets that the VTP code will request that the Cisco IOS VTP platform-dependent layer to send.
xmit	Displays the contents of all outgoing VTP packets that the VTP code will request that the Cisco IOS VTP platform-dependent layer to send; does not include pruning packets.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

If you do not enter any more parameters after entering **pruning**, the VTP pruning debugging messages are displayed.

Examples

This example shows how to debug the software VLAN outgoing VTP packets:

```
Switch# debug sw-vlan vtp xmit
vtp xmit debugging is on
Switch#
```

Related Commands

undebug sw-vlan vtp (same as **no debug sw-vlan vtp**)

debug udld

To enable the debugging of UDLD activity, use the **debug udld** command. To disable the debugging output, use the **no** form of this command.

debug udld {events | packets | registries}

no debug udld {events | packets | registries}

Syntax Description	events	Enables the debugging of UDLD process events as they occur.
	packets	Enables the debugging of the UDLD process as it receives packets from the packet queue and attempts to transmit packets at the request of the UDLD protocol code.
	registries	Enables the debugging of the UDLD process as it processes registry upcalls from the UDLD process-dependent module and other feature modules.

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Usage Guidelines	This command is supported only by the supervisor engine and can be entered only from the Catalyst 4500 series switch console.
------------------	---

Examples	This example shows how to debug the UDLD events: Switch# debug udld events UDLD events debugging is on Switch#
	This example shows how to debug the UDLD packets: Switch# debug udld packets UDLD packets debugging is on Switch#
	This example shows how to debug the UDLD registry events: Switch# debug udld registries UDLD registries debugging is on Switch#

Related Commands	undebg udld (same as no debug udld)
------------------	--

debug vqpc

To debug the VLAN Query Protocol (VQP), use the **debug vqpc** command. To disable the debugging output, use the **no** form of this command.

debug vqpc [**all** | **cli** | **events** | **learn** | **packet**]

no debug vqpc [**all** | **cli** | **events** | **learn** | **packet**]

Syntax Description	all	(Optional) Debugs all the VQP events.
	cli	(Optional) Debugs the VQP command-line interface.
	events	(Optional) Debugs the VQP events.
	learn	(Optional) Debugs the VQP address learning.
	packet	(Optional) Debugs the VQP packets.

Defaults This command has no default settings.

Command Modes Privileged EXEC

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

Examples This example shows how to enable all VQP debugging:

```
Switch# debug vqpc all
Switch#
```

Related Commands [vmpls reconfirm \(privileged EXEC\)](#)

define interface-range

To create a macro of interfaces, use the **define interface-range** command.

define interface-range *macro-name interface-range*

Syntax Description	<i>macro-name</i>	Name of the interface range macro; up to 32 characters.
	<i>interface-range</i>	List of valid ranges when specifying interfaces; see the “Usage Guidelines” section.

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

Command Modes	Global configuration
---------------	----------------------

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

Usage Guidelines	The macro name is a character string of up to 32 characters.
	A macro can contain up to five ranges. An interface range cannot span modules.
	When entering the <i>interface-range</i> , use these formats:
	<ul style="list-style-type: none"><i>interface-type</i> {<i>mod</i>}/{<i>first-interface</i>} - {<i>last-interface</i>}<i>interface-type</i> {<i>mod</i>}/{<i>first-interface</i>} - {<i>last-interface</i>}
	The valid values for <i>interface-type</i> are as follows:

- **FastEthernet**
- **GigabitEthernet**
- **Vlan** *vlan_id*

Examples	This example shows how to create a multiple-interface macro:
	Switch(config)# define interface-range macro1 gigabitethernet 4/1-6, fastethernet 2/1-5
	Switch(config)#

Related Commands	interface range
------------------	---------------------------------

deny

To deny an ARP packet based on matches against the DHCP bindings, use the **deny** command. To remove the specified ACEs from the access list, use the **no** form of this command.

deny {[**request**] **ip** {**any** | **host** *sender-ip* | *sender-ip sender-ip-mask*} **mac** {**any** | **host** *sender-mac* | *sender-mac sender-mac-mask*} | **response ip** {**any** | **host** *sender-ip* | *sender-ip sender-ip-mask*} [{**any** | **host** *target-ip* | *target-ip target-ip-mask*}] **mac** {**any** | **host** *sender-mac* | *sender-mac sender-mac-mask*} [{**any** | **host** *target-mac* | *target-mac target-mac-mask*}}] [**log**]

no deny {[**request**] **ip** {**any** | **host** *sender-ip* | *sender-ip sender-ip-mask*} **mac** {**any** | **host** *sender-mac* | *sender-mac sender-mac-mask*} | **response ip** {**any** | **host** *sender-ip* | *sender-ip sender-ip-mask*} [{**any** | **host** *target-ip* | *target-ip target-ip-mask*}] **mac** {**any** | **host** *sender-mac* | *sender-mac sender-mac-mask*} [{**any** | **host** *target-mac* | *target-mac target-mac-mask*}}] [**log**]

Syntax Description

request	(Optional) Requests a match for the ARP request. When request is not specified, matching is performed against all ARP packets.
ip	Specifies the sender IP address.
any	Specifies that any IP or MAC address will be accepted.
host <i>sender-ip</i>	Specifies that only a specific sender IP address will be accepted.
<i>sender-ip sender-ip-mask</i>	Specifies that a specific range of sender IP addresses will be accepted.
mac	Specifies the sender MAC address.
host <i>sender-mac</i>	Specifies that only a specific sender MAC address will be accepted.
<i>sender-mac sender-mac-mask</i>	Specifies that a specific range of sender MAC addresses will be accepted.
response	Specifies a match for the ARP responses.
ip	Specifies the IP address values for the ARP responses.
host <i>target-ip</i>	(Optional) Specifies that only a specific target IP address will be accepted.
<i>target-ip target-ip-mask</i>	(Optional) Specifies that a specific range of target IP addresses will be accepted.
mac	Specifies the MAC address values for the ARP responses.
host <i>target-mac</i>	(Optional) Specifies that only a specific target MAC address will be accepted.
<i>target-mac target-mac-mask</i>	(Optional) Specifies that a specific range of target MAC addresses will be accepted.
log	(Optional) Logs a packet when it matches the access control entry (ACE).

Defaults

At the end of the ARP access list, there is an implicit **deny ip any mac any** command.

Command Modes

arp-nacl configuration

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

Usage Guidelines Deny clauses can be added to forward or drop ARP packets based on some matching criteria.

Examples This example shows a host with a MAC address of 0000.0000.abcd and an IP address of 1.1.1.1. This example shows howto deny both requests and responses from this host:

```
Switch(config)# arp access-list static-hosts
Switch(config-arp-nacl)# deny ip host 1.1.1.1 mac host 0000.0000.abcd
Switch(config-arp-nacl)# end
Switch# show arp access-list

ARP access list static-hosts
    deny ip host 1.1.1.1 mac host 0000.0000.abcd
Switch#
```

Related Commands [arp access-list](#)
[ip arp inspection filter vlan](#)
[permit](#)

diagnostic monitor action

To direct the action of the switch when it detects a packet memory failure, use the **diagnostic monitor action** command.

diagnostic monitor action [**conservative** | **normal** | **aggressive**]

Syntax Description	<table> <tr> <td data-bbox="342 485 649 625">conservative</td><td data-bbox="688 485 1497 625">(Optional) Specifies that the bootup SRAM diagnostics log all failures and remove all affected buffers from the hardware operation. The ongoing SRAM diagnostics will log events, but will take no other action.</td></tr> <tr> <td data-bbox="342 625 649 730">normal</td><td data-bbox="688 625 1497 730">(Optional) Specifies that the SRAM diagnostics operate as in conservative mode, except that an ongoing failure resets the supervisor engine; allows for the bootup tests to map out the affected memory.</td></tr> <tr> <td data-bbox="342 730 649 867">aggressive</td><td data-bbox="688 730 1497 867">(Optional) Specifies that the SRAM diagnostics operate as in normal mode, except that a bootup failure only logs failures and does not allow the supervisor engine to come online; allows for either a redundant supervisor engine or network-level redundancy to take over.</td></tr> </table>	conservative	(Optional) Specifies that the bootup SRAM diagnostics log all failures and remove all affected buffers from the hardware operation. The ongoing SRAM diagnostics will log events, but will take no other action.	normal	(Optional) Specifies that the SRAM diagnostics operate as in conservative mode, except that an ongoing failure resets the supervisor engine; allows for the bootup tests to map out the affected memory.	aggressive	(Optional) Specifies that the SRAM diagnostics operate as in normal mode, except that a bootup failure only logs failures and does not allow the supervisor engine to come online; allows for either a redundant supervisor engine or network-level redundancy to take over.
conservative	(Optional) Specifies that the bootup SRAM diagnostics log all failures and remove all affected buffers from the hardware operation. The ongoing SRAM diagnostics will log events, but will take no other action.						
normal	(Optional) Specifies that the SRAM diagnostics operate as in conservative mode, except that an ongoing failure resets the supervisor engine; allows for the bootup tests to map out the affected memory.						
aggressive	(Optional) Specifies that the SRAM diagnostics operate as in normal mode, except that a bootup failure only logs failures and does not allow the supervisor engine to come online; allows for either a redundant supervisor engine or network-level redundancy to take over.						
Defaults	normal mode						
Command Modes	Global configuration mode						
Command History	<table> <tr> <th data-bbox="342 1159 617 1199">Release</th><th data-bbox="630 1159 1497 1199">Modification</th></tr> <tr> <td data-bbox="342 1199 617 1247">12.2(18)EW</td><td data-bbox="630 1199 1497 1247">This command was introduced on the Catalyst 4500 series switch.</td></tr> </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	<p>Use the conservative keyword when you do not want the switch to reboot so that the problem can be fixed.</p> <p>Use the aggressive keyword when you have redundant supervisor engines, or when network-level redundancy has been provided.</p>						
Examples	<p>This example shows how to configure the switch to initiate an RPR switchover when an ongoing failure occurs:</p> <pre>Switch# configure terminal Switch (config)# diagnostic monitor action normal</pre>						
Related Commands	<p>show diagnostic result module test 2</p> <p>show diagnostic result module test 3</p>						

dot1x guest-vlan

To enable a guest VLAN on a per-port basis, use the **dot1x guest-vlan** command. To return to the default setting, use the **no** form of this command.

dot1x guest-vlan *vlan-id*

no dot1x guest-vlan *vlan-id*

Syntax Description	<i>vlan-id</i>	Specifies a VLAN in the range of 1 to 4094.
--------------------	----------------	---

Defaults	None; the guest VLAN feature is disabled.
----------	---

Command Modes	Interface configuration
---------------	-------------------------

Command History	Release	Modification
	12.1(19)EW	Support for this command was introduced on the Catalyst 4500 series switch.
	12.2(25)EWA	Support for secondary VLAN as the configured guest VLAN ID was added.

Usage Guidelines	Guest VLANs can be configured only on ports that are statically configured as access ports or private VLAN host ports. Statically configured access ports can be configured with regular VLANs as guest VLANs; statically configured private VLAN host ports can be configured with secondary private VLANs as guest VLANs.
------------------	---

Examples	This example shows how to enable a guest VLAN on Fast Ethernet interface 4/3:
----------	---

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# interface fastethernet4/3
Switch(config-if)# dot1x port-control auto
Switch(config-if)# dot1x guest-vlan 26
Switch(config-if)# end
Switch(config)# end
Switch#
```

Related Commands	dot1x max-reauth-req show dot1x
------------------	--

dot1X guest-vlan supplicant

To place an 802.1X-capable supplicant (host) into a guest VLAN, use the **dot1x guest-vlan supplicant** global configuration command. To return to the default setting, use the **no** form of this command.

dot1x guest-vlan supplicant

no dot1x guest-vlan supplicant

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

Defaults	802.1X-capable hosts are not put into a guest VLAN.
-----------------	---

Command Modes	Global configuration
----------------------	----------------------

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

Usage Guidelines	With Cisco Release 12.2(25) EWA, you can use the dot1x guest-vlan supplicant command to place an 802.1X-capable host into a guest VLAN. Prior to Cisco Release 12.2(25)EWA, you could only place non-802.1X capable hosts into a guest VLAN.
-------------------------	---

When guest VLAN supplicant behavior is enabled, the Catalyst 4500 series switch does not maintain EAPOL packet history. The switch allows clients that fail 802.1X authentication to access a guest VLAN, whether or not EAPOL packets have been detected on the interface.

Examples	This example shows how to place an 802.1X-capable supplicant (host) into a guest VLAN:
-----------------	--

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# dot1x guest-vlan supplicant
Switch(config)# end
Switch#
```

Related Commands	dot1x system-auth-control show dot1x
-------------------------	---

dot1x host-mode

Use the **dot1x host-mode** interface configuration command on the switch stack or on a standalone switch to allow a single host (client) or multiple hosts on an IEEE 802.1x-authorized port. Use the **multi-domain** keyword to enable multidomain authentication (MDA) on an IEEE 802.1x-authorized port. Use the **no** form of this command to return to the default setting.

dot1x host-mode {multi-host | single-host}

no dot1x host-mode [multi-host | single-host]

Syntax Description	multi-host	Enable multiple-hosts mode on the switch.
	single-host	Enable single-host mode on the switch.

Defaults The default is single-host mode.

Command Modes Interface configuration

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

Usage Guidelines Use this command to limit an IEEE 802.1x-enabled port to a single client or to attach multiple clients to an IEEE 802.1x-enabled port. In multiple-hosts mode, only one of the attached hosts needs to be successfully authorized for all hosts to be granted network access. If the port becomes unauthorized (re-authentication fails or an Extensible Authentication Protocol over LAN [EAPOL]-logoff message is received), all attached clients are denied access to the network.

Before entering this command, make sure that the **dot1x port-control** interface configuration command is set to **auto** for the specified port.

Examples This example shows how to enable MDA and to allow both a host and a voice device on the port:

```
Switch# configure t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# interface FastEthernet6/1
Switch(config-if)# switchport access vlan 12
Switch(config-if)# switchport mode access
Switch(config-if)# switchport voice vlan 10
Switch(config-if)# dot1x pae authenticator
Switch(config-if)# dot1x port-control auto
Switch(config-if)# dot1x host-mode multi-domain
Switch(config-if)# no shutdown
Switch(config-if)# end
Switch#
```

You can verify your settings by entering the **show dot1x** [**interface** *interface-id*] privileged EXEC command.

Related Commands [show dot1x](#)

dot1x initialize

To unauthorize an interface before reinitializing 802.1X, use the **dot1x initialize** command.

dot1x initialize *interface*

Syntax Description	<i>interface</i>	Number of the interface.
--------------------	------------------	--------------------------

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Usage Guidelines	Use this command to initialize state machines and to set up the environment for fresh authentication.
------------------	---

Examples	This example shows how to initialize the 802.1X state machines on an interface: Switch# dot1x initialize Switch#
----------	---

Related Commands	dot1x initialize show dot1x
------------------	--

dot1x max-reauth-req

To set the maximum number of times that the switch will retransmit an EAP-Request/Identity frame to the client before restarting the authentication process, use the **dot1x max-reauth-req** command. To return to the default setting, use the **no** form of this command.

dot1x max-reauth-req *count*

no dot1x max-reauth-req

Syntax Description

<i>count</i>	Number of times that the switch retransmits EAP-Request/Identity frames before restarting the authentication process; valid values are from 1 to 10.
--------------	--

Defaults

The switch sends a maximum of two retransmissions.

Command Modes

Interface configuration.

Command History

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

Usage Guidelines

You should change the default value of this command only to adjust for unusual circumstances such as unreliable links or specific behavioral problems with certain clients and authentication servers. This setting impacts the wait before a non-dot1x-capable client is admitted to the guest VLAN, if one is configured.

You can verify your settings by entering the **show dot1x** privileged EXEC command.

Examples

This example shows how to set 5 as the number of times that the switch retransmits an EAP-Request/Identity frame before restarting the authentication process:

```
Switch(config-if)# dot1x max-reauth-req 5
Switch(config-if)#
```

Related Commands

[show dot1x](#)

dot1x max-req

To set the maximum number of times that the switch retransmits an Extensible Authentication Protocol (EAP)-Request frame of types other than EAP-Request/Identity to the client before restarting the authentication process, use the **dot1x max-req** command. To return to the default setting, use the **no** form of this command.

dot1x max-req *count*

no dot1x max-req

Syntax Description

<i>count</i>	Number of times that the switch retransmits EAP-Request frames of types other than EAP-Request/Identity before restarting the authentication process; valid values are from 1 to 10.
--------------	--

Defaults

The switch sends a maximum of two retransmissions.

Command Modes

Interface configuration

Command History

Release	Modification
12.1(12c)EW	Support for this command was introduced on the Catalyst 4500 series switch.
12.1(19)EW	This command was modified to control on EAP-Request/Identity retransmission limits.

Usage Guidelines

You should change the default value of this command only to adjust for unusual circumstances such as unreliable links or specific behavioral problems with certain clients and authentication servers.

You can verify your settings by entering the **show dot1x** privileged EXEC command.

Examples

This example shows how to set 5 as the number of times that the switch retransmits an EAP-Request frame before restarting the authentication process:

```
Switch(config-if)# dot1x max-req 5
Switch(config-if)#
```

Related Commands

[dot1x initialize](#)
[dot1x max-reauth-req](#)
[show dot1x](#)

dot1x port-control

To enable manual control of the authorization state on a port, use the **dot1x port-control** command. To return to the default setting, use the **no** form of this command.

dot1x port-control {auto | force-authorized | force-unauthorized}

no dot1x port-control {auto | force-authorized | force-unauthorized}

Syntax Description	auto	Enables 802.1X authentication on the interface and causes the port to transition to the authorized or unauthorized state based on the 802.1X authentication exchange between the switch and the client.
	force-authorized	Disables 802.1X authentication on the interface and causes the port to transition to the authorized state without any authentication exchange required. The port transmits and receives normal traffic without 802.1X-based authentication of the client.
	force-unauthorized	Denies all access through the specified interface by forcing the port to transition to the unauthorized state, ignoring all attempts by the client to authenticate. The switch cannot provide authentication services to the client through the interface.

Defaults The port 802.1X authorization is disabled.

Command Modes Interface configuration

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

Usage Guidelines The 802.1X protocol is supported on both the Layer 2 static-access ports and the Layer 3-routed ports. You can use the **auto** keyword only if the port is not configured as follows:

- Trunk port—If you try to enable 802.1X on a trunk port, an error message appears, and 802.1X is not enabled. If you try to change the mode of an 802.1X-enabled port to trunk, the port mode is not changed.
- Dynamic ports—A port in dynamic mode can negotiate with its neighbor to become a trunk port. If you try to enable 802.1X on a dynamic port, an error message appears, and 802.1X is not enabled. If you try to change the mode of an 802.1X-enabled port to dynamic, the port mode is not changed.
- EtherChannel port—Before enabling 802.1X on the port, you must first remove it from the EtherChannel. If you try to enable 802.1X on an EtherChannel or on an active port in an EtherChannel, an error message appears, and 802.1X is not enabled. If you enable 802.1X on an inactive port of an EtherChannel, the port does not join the EtherChannel.

- Switch Port Analyzer (SPAN) destination port—You can enable 802.1X on a port that is a SPAN destination port; however, 802.1X is disabled until the port is removed as a SPAN destination. You can enable 802.1X on a SPAN source port.

To globally disable 802.1X on the switch, you must disable it on each port. There is no global configuration command for this task.

Examples

This example shows how to enable 802.1X on Gigabit Ethernet 1/1:

```
Switch(config)# interface gigabitethernet1/1
Switch(config-if)# dot1x port-control auto
Switch#
```

You can verify your settings by using the **show dot1x all** or **show dot1x interface *int*** commands to show the port-control status. An enabled status indicates that the port-control value is set either to **auto** or to **force-unauthorized**.

Related Commands

[show dot1x](#)

dot1x re-authenticate

To manually initiate a reauthentication of all 802.1X-enabled ports or the specified 802.1X-enabled port, use the **dot1x re-authenticate** command.

dot1x re-authenticate [**interface** *interface-id*]

Syntax Description	interface <i>interface-id</i> (Optional) Slot and port number of the interface.
--------------------	--

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

Command Modes	Privileged EXEC
---------------	-----------------

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

Usage Guidelines	You can use this command to reauthenticate a client without waiting for the configured number of seconds between reauthentication attempts (re-authperiod) and automatic reauthentication.
------------------	--

Examples	This example shows how to manually reauthenticate the device connected to Gigabit Ethernet interface 1/1:
----------	---

```
Switch# dot1x re-authenticate interface gigabitethernet1/1
Starting reauthentication on gigabitethernet1/1
Switch#
```

dot1x re-authentication

To enable the periodic reauthentication of the client, use the **dot1x re-authentication** command. To return to the default setting, use the **no** form of this command.

dot1x re-authentication

no dot1x re-authentication

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

Defaults	The periodic reauthentication is disabled.
-----------------	--

Command Modes	Interface configuration
----------------------	-------------------------

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

Usage Guidelines	You configure the amount of time between the periodic reauthentication attempts by using the dot1x timeout re-authperiod global configuration command.
-------------------------	---

Examples	<p>This example shows how to disable the periodic reauthentication of the client:</p> <pre>Switch(config-if)# no dot1x re-authentication Switch(config-if)#</pre> <p>This example shows how to enable the periodic reauthentication and set the number of seconds between the reauthentication attempts to 4000 seconds:</p> <pre>Switch(config-if)# dot1x re-authentication Switch(config-if)# dot1x timeout re-authperiod 4000 Switch#</pre> <p>You can verify your settings by entering the show dot1x privileged EXEC command.</p>
-----------------	---

Related Commands	dot1x timeout show dot1x
-------------------------	---

dot1x system-auth-control

To enable 802.1X authentication on the switch, use the **dot1x system-auth-control** command. To disable 802.1X authentication on the system, use the **no** form of this command.

dot1x system-auth-control

no dot1x system-auth-control

Syntax Description This command has no arguments or keywords.

Defaults The 802.1X authentication is disabled.

Command Modes Global configuration

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

Usage Guidelines You must enable **dot1x system-auth-control** if you want to use the 802.1X access controls on any port on the switch. You can then use the **dot1x port-control auto** command on each specific port on which you want the 802.1X access controls to be used.

Examples This example shows how to enable 802.1X authentication:

```
Switch(config)# dot1x system-auth-control
Switch(config)#
```

Related Commands [dot1x initialize](#)
[show dot1x](#)

dot1x timeout

To set the reauthentication timer, use the **dot1x timeout** command. To return to the default setting, use the **no** form of this command.

dot1x timeout { **reauth-period** { *seconds* | **server** } | **quiet-period** *seconds* | **tx-period** *seconds* | **supp-timeout** *seconds* | **server-timeout** *seconds* }

no dot1x timeout { **reauth-period** | **quiet-period** | **tx-period** | **supp-timeout** | **server-timeout** }

Syntax Description

reauth-period <i>seconds</i>	Number of seconds between reauthentication attempts; valid values are from 1 to 65535. See the “Usage Guidelines” section for more information.
reauth-period server	Number of seconds between reauthentication attempts; valid values are from 1 to 65535 as derived from the Session-Timeout RADIUS attribute. See the “Usage Guidelines” section for more information.
quiet-period <i>seconds</i>	Number of seconds that the switch remains in the quiet state following a failed authentication exchange with the client; valid values are from 0 to 65535 seconds.
tx-period <i>seconds</i>	Number of seconds that the switch waits for a response to an EAP-request/identity frame from the client before retransmitting the request; valid values are from 15 to 65535 seconds.
supp-timeout <i>seconds</i>	Number of seconds that the switch waits for the retransmission of EAP-Request packets; valid values are from 30 to 65535 seconds.
server-timeout <i>seconds</i>	Number of seconds that the switch waits for the retransmission of packets by the back-end authenticator to the authentication server; valid values are from 30 to 65535 seconds.

Defaults

The default settings are as follows:

- Reauthentication period is 3600 seconds.
- Quiet period is 60 seconds.
- Transmission period is 30 seconds.
- Supplicant timeout is 30 seconds.
- Server timeout is 30 seconds.

Command Modes

Interface configuration

Command History

Release	Modification
12.1(12)EW	Support for this command was introduced on the Catalyst 4500 series switches.
12.2(25)EWA	Support for selecting the reauthentication timer from the “server” was added.

Usage Guidelines

The periodic reauthentication must be enabled before entering the **dot1x timeout re-authperiod** command. Enter the **dot1x re-authentication** command to enable periodic reauthentication.

Examples

This example shows how to set 60 as the number of seconds that the switch waits for a response to an EAP-request/identity frame from the client before retransmitting the request:

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# interface fastethernet4/3
Switch(config-if)# dot1x timeout tx-period 60
Switch(config-if)# end
Switch#
```

You can verify your settings by entering the **show dot1x** privileged EXEC command.

This example shows how to set up the switch to use a reauthentication timeout derived from a Session-Timeout attribute taken from the RADIUS Access-Accept message received when a host successfully authenticates via 802.1X:

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# interface fastethernet4/3
Switch(config-if)# dot1x timeout reauth-period server
Switch(config-if)# end
Switch#
```

Related Commands

dot1x initialize
show dot1x

duplex

To configure the duplex operation on an interface, use the **duplex** command. To return to the default setting, use the **no** form of this command.

duplex { auto | full | half }

no duplex

Syntax Description

auto	Specifies the autonegotiation operation.
full	Specifies the full-duplex operation.
half	Specifies the half-duplex operation.

Defaults

Half-duplex operation

Command Modes

Interface configuration

Command History

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

Usage Guidelines

[Table 2-2](#) lists the supported command options by interface.

Table 2-2 Supported duplex Command Options

Interface Type	Supported Syntax	Default Setting	Guidelines
10/100-Mbps module	duplex [half full]	half	If the speed is set to auto , you will not be able to set the duplex mode. If the speed is set to 10 or 100 , and you do not configure the duplex setting, the duplex mode is set to half duplex.
100-Mbps fiber modules	duplex [half full]	half	
Gigabit Ethernet Interface	Not supported.	Not supported.	Gigabit Ethernet interfaces are set to full duplex.
10/100/1000	duplex [half full]		If the speed is set to auto or 1000 , you will not be able to set duplex . If the speed is set to 10 or 100 , and you do not configure the duplex setting, the duplex mode is set to half duplex.

If the transmission speed on a 16-port RJ-45 Gigabit Ethernet port is set to **1000**, the duplex mode is set to **full**. If the transmission speed is changed to **10** or **100**, the duplex mode stays at **full**. You must configure the correct duplex mode on the switch when the transmission speed changes to **10** or **100** from 1000 Mbps.

**Note**

Catalyst 4006 switches cannot automatically negotiate interface speed and duplex mode if either connecting interface is configured to a value other than **auto**.

**Caution**

Changing the interface speed and duplex mode configuration might shut down and reenables the interface during the reconfiguration.

Table 2-3 describes the system performance for different combinations of the duplex and speed modes. The specified **duplex** command that is configured with the specified **speed** command produces the resulting action shown in the table.

Table 2-3 Relationship Between duplex and speed Commands

duplex Command	speed Command	Resulting System Action
duplex half or duplex full	speed auto	Autonegotiates both speed and duplex modes
duplex half	speed 10	Forces 10 Mbps and half duplex
duplex full	speed 10	Forces 10 Mbps and full duplex
duplex half	speed 100	Forces 100 Mbps and half duplex
duplex full	speed 100	Forces 100 Mbps and full duplex
duplex full	speed 1000	Forces 1000 Mbps and full duplex

Examples

This example shows how to configure the interface for full-duplex operation:

```
Switch(config-if) # duplex full
Switch(config-if) #
```

Related Commands**speed**

interface (refer to Cisco IOS documentation)

show controllers (refer to Cisco IOS documentation)

show interfaces (refer to Cisco IOS documentation)

errdisable detect

To enable error-disable detection, use the **errdisable detect** command. To disable the error-disable detection feature, use the **no** form of this command.

errdisable detect cause { all | arp-inspection | dhcp-rate-limit | dtp-flap | gbic-invalid | l2ptguard | link-flap | pagp-flap }

no errdisable detect cause { all | arp-inspection | dhcp-rate-limit | dtp-flap | gbic-invalid | l2ptguard | link-flap | pagp-flap }

Syntax Description		
cause		Specifies error-disable detection to detect from a specific cause.
all		Specifies error-disable detection for all error-disable causes.
arp-inspection		Specifies the detection for the ARP inspection error-disable cause.
dhcp-rate-limit		Specifies the detection for the DHCP rate-limit error-disable cause.
dtp-flap		Specifies the detection for the DTP flap error-disable cause.
gbic-invalid		Specifies the detection for the GBIC invalid error-disable cause.
l2ptguard		Specifies the detection for the Layer 2 protocol-tunnel error-disable cause.
link-flap		Specifies the detection for the link flap error-disable cause.
pagp-flap		Specifies the detection for the PAGP flap error-disable cause.

Defaults All error-disable causes are detected.

Command Modes Global configuration

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

Usage Guidelines A cause (dtp-flap, link-flap, pagp-flap) is defined as the reason why the error-disabled state occurred. When a cause is detected on an interface, the interface is placed in error-disabled state (an operational state that is similar to link-down state).

You must enter the **shutdown** command and then the **no shutdown** command to recover an interface manually from the error-disable state.

Examples This example shows how to enable error-disable detection for the link-flap error-disable cause:

```
Switch(config)# errdisable detect cause link-flap
Switch(config)#
```

This example shows how to disable error-disable detection for DAI:

```
Switch(config)# no errdisable detect cause arp-inspection
Switch(config)# end
Switch# show errdisable detect
ErrDisable Reason    Detection status
-----
udld                  Enabled
bpduguard             Enabled
security-violatio    Enabled
channel-misconfig    Disabled
psecure-violation    Enabled
vmps                  Enabled
pagp-flap             Enabled
dtp-flap              Enabled
link-flap             Enabled
l2ptguard             Enabled
gbic-invalid          Enabled
dhcp-rate-limit      Enabled
unicast-flood         Enabled
storm-control         Enabled
ilpower               Enabled
arp-inspection        Disabled
Switch#
```

Related Commands

[show errdisable detect](#)
[show interfaces status](#)

errdisable recovery

To configure the recovery mechanism variables, use the **errdisable recovery** command. To return to the default setting, use the **no** form of this command.

```
errdisable recovery [cause {all | arp-inspection | bpduguard | channel-misconfig |
dhcp-rate-limit | dtp-flap | gbic-invalid | l2ptguard | link-flap | pagp-flap |
psecure-violation | security-violation | storm-control | udld | unicastflood | vmps}
[arp-inspection] [interval {interval}]]
```

```
no errdisable recovery [cause {all | arp-inspection | bpduguard | channel-misconfig |
dhcp-rate-limit | dtp-flap | gbic-invalid | l2ptguard | link-flap | pagp-flap |
psecure-violation | security-violation | storm-control | udld | unicastflood | vmps}
[arp-inspection] [interval {interval}]]
```

Syntax Description

cause	(Optional) Enables the error-disable recovery to recover from a specific cause.
all	(Optional) Enables the recovery timers for all error-disable causes.
arp-inspection	(Optional) Enables the recovery timer for the ARP inspection cause.
bpduguard	(Optional) Enables the recovery timer for the BPDU guard error-disable cause.
channel-misconfig	(Optional) Enables the recovery timer for the channel-misconfig error-disable cause.
dhcp-rate-limit	(Optional) Enables the recovery timer for the DHCP rate limit error-disable cause.
dtp-flap	(Optional) Enables the recovery timer for the DTP flap error-disable cause.
gbic-invalid	(Optional) Enables the recovery timer for the GBIC invalid error-disable cause.
l2ptguard	(Optional) Enables the recovery timer for the Layer 2 protocol-tunnel error-disable cause.
link-flap	(Optional) Enables the recovery timer for the link flap error-disable cause.
pagp-flap	(Optional) Enables the recovery timer for the PAgP flap error-disable cause.
psecure-violation	(Optional) Enables the recovery timer for the psecure violation error-disable cause.
security-violation	(Optional) Enables the automatic recovery of ports disabled due to 802.1X security violations.
storm-control	(Optional) Enables the timer to recover from storm-control error-disable state.
udld	(Optional) Enables the recovery timer for the UDLD error-disable cause.
unicastflood	(Optional) Enables the recovery timer for the unicast flood error-disable cause.
vmps	(Optional) Enables the recovery timer for the VMPS error-disable cause.
arp-inspection	(Optional) Enables the ARP inspection cause and recovery timeout.
interval <i>interval</i>	(Optional) Specifies the time to recover from a specified error-disable cause; valid values are from 30 to 86400 seconds.

Defaults

Error disable recovery is disabled.

The recovery interval is set to 300 seconds.

Command Modes

Configuration

Command History

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

Usage Guidelines

A cause (bpduguard, dtp-flap, link-flap, pagp-flap, udld) is defined as the reason why the error-disabled state occurred. When a cause is detected on an interface, the interface is placed in error-disabled state (an operational state that is similar to the link-down state). If you do not enable error-disable recovery for the cause, the interface stays in the error-disabled state until a shutdown and no shutdown occurs. If you enable recovery for a cause, the interface is brought out of the error-disabled state and allowed to retry operation again once all the causes have timed out.

You must enter the **shutdown** command and then the **no shutdown** command to recover an interface manually from error disable.

Examples

This example shows how to enable the recovery timer for the BPDU guard error disable cause:

```
Switch(config)# errdisable recovery cause bpduguard
Switch(config)#
```

This example shows how to set the timer to 300 seconds:

```
Switch(config)# errdisable recovery interval 300
Switch(config)#
```

This example shows how to enable the errdisable recovery for arp-inspection:

```
Switch(config)# errdisable recovery cause arp-inspection
Switch(config)# end
Switch# show errdisable recovery
ErrDisable Reason    Timer Status
-----
udld                  Disabled
bpduguard             Disabled
security-violatio    Disabled
channel-misconfig    Disabled
vmps                  Disabled
pagp-flap             Disabled
dtp-flap              Disabled
link-flap             Disabled
l2ptguard             Disabled
psecure-violation    Disabled
gbic-invalid          Disabled
dhcp-rate-limit      Disabled
unicast-flood        Disabled
storm-control        Disabled
arp-inspection        Enabled
```

```
Timer interval: 300 seconds
```

```
Interfaces that will be enabled at the next timeout:
```

```
Switch#
```

Related Commands

[show errdisable recovery](#)

[show interfaces status](#)

flowcontrol

To configure a Gigabit Ethernet interface to send or receive pause frames, use the **flowcontrol** command. To disable the flow control setting, use the **no** form of this command.

flowcontrol { **receive** | **send** } { **off** | **on** | **desired** }

no flowcontrol { **receive** | **send** } { **off** | **on** | **desired** }

Syntax Description

receive	Specifies that the interface processes pause frames.
send	Specifies that the interface sends pause frames.
off	Prevents a local port from receiving and processing pause frames from remote ports or from sending pause frames to remote ports.
on	Enables a local port to receive and process pause frames from remote ports or send pause frames to remote ports.
desired	Obtains predictable results whether a remote port is set to on, off, or desired.

Defaults

The default settings for Gigabit Ethernet interfaces are as follows:

- Sending pause frames is desired—Gigabit Ethernet interfaces.
- Receiving pause frames is off—Gigabit Ethernet interfaces.
- Sending pause frames is on—Oversubscribed Gigabit Ethernet interfaces.
- Receiving pause frames is desired—Oversubscribed Gigabit Ethernet interfaces

Table 2-4 shows the default settings for the modules.

Table 2-4 Default Module Settings

Module	Ports	Send
All modules except WS-X4418-GB, WS-X4412-2GB-TX, and WS-X4416-2GB-TX	All ports except for the oversubscribed ports (1–18)	No
WS-X4418-GB	Uplink ports (1–2)	No
WS-X4418-GB	Oversubscribed ports (3–18)	Yes
WS-X4412-2GB-TX	Uplink ports (13–14)	No
WS-X4412-2GB-TX	Oversubscribed ports (1–12)	Yes
WS-X4416-2GB-TX	Uplink ports (17–18)	No

Command Modes

Interface configuration

Command History

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

Usage Guidelines

The pause frames are special packets that signal a source to stop sending frames for a specific period of time because the buffers are full.

Table 2-5 describes the guidelines for using the different configurations of the **send** and **receive** keywords with the **flowcontrol** command.

Table 2-5 Keyword Configurations for send and receive

Configuration	Description
send on	Enables a local port to send pause frames to remote ports. To obtain predictable results, use send on only when remote ports are set to receive on or receive desired .
send off	Prevents a local port from sending pause frames to remote ports. To obtain predictable results, use send off only when remote ports are set to receive off or receive desired .
send desired	Obtains predictable results whether a remote port is set to receive on , receive off , or receive desired .
receive on	Enables a local port to process pause frames that a remote port sends. To obtain predictable results, use receive on only when remote ports are set to send on or send desired .
receive off	Prevents remote ports from sending pause frames to a local port. To obtain predictable results, use send off only when remote ports are set to receive off or receive desired .
receive desired	Obtains predictable results whether a remote port is set to send on , send off , or send desired .

Table 2-6 identifies how the flow control will be forced or negotiated on the Gigabit Ethernet interfaces based on their speed settings.

**Note**

Catalyst 4006 switches support flow control only on the gigabit interfaces.

Table 2-6 Send Capability by Switch Type, Module, and Port

Interface Type	Configured Speed	Advertised Flow Control
10/100/1000BASE-TX	Speed 1000	Configured flow control always
1000BASE-T	Negotiation always enabled	Configured flow control always negotiated
1000BASE-X	No speed nonnegotiation	Configured flow control negotiated
1000BASE-X	Speed nonnegotiation	Configured flow control forced

Examples

This example shows how to enable send flow control:

```
Switch(config-if)# flowcontrol receive on  
Switch(config-if)#
```

This example shows how to disable send flow control:

```
Switch(config-if)# flowcontrol send off  
Switch(config-if)#
```

This example shows how to set receive flow control to desired:

```
Switch(config-if)# flowcontrol receive desired  
Switch(config-if)#
```

Related Commands

[interface port-channel](#)

[interface range](#)

[interface vlan](#)

[show flowcontrol](#)

[show running-config](#) (refer to Cisco IOS Documentation)

[speed](#)

hw-module power

To turn the power off on a slot or line module, use the **no hw-module power** command. To turn the power back on, use the **hw-module power** command.

hw-module [**slot** | **module**] *number* **power**

no hw-module [**slot** | **module**] *number* **power**

Syntax Description	slot	(Optional) Specifies a slot on a chassis.
	module	(Optional) Specifies a line module.
	<i>number</i>	(Optional) Slot or module number.

Defaults	After a boot up, the power is on.
----------	-----------------------------------

Command Modes	Global configuration
---------------	----------------------

Command History	Release	Modification
	12.1(8a)EW	Support for this command was introduced on the Catalyst 4500 series switch.
	12.2(18)EW	Add slot and module keywords.

Examples	This example shows how to shut off power to a module in slot 5:
----------	---

```
Switch# no hw-module slot 5 power
Switch#
```

Related Commands	clear hw-module slot password
------------------	---

hw-module uplink select

To select the 10-Gigabit Ethernet or Gigabit Ethernet uplinks on the Supervisor Engine V-10GE, use the **hw-module uplink select** command.

hw-module uplink select { tengigabitethernet | gigabitethernet }

Syntax Description	tengigabitethernet	(Optional) Specifies the 10-Gigabit Ethernet uplinks.
	gigabitethernet	(Optional) Specifies the Gigabit Ethernet uplinks.

Defaults	tengigabitethernet
----------	--------------------

Command Modes	Global configuration
---------------	----------------------

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

Usage Guidelines

Because the uplink selection is programmed into hardware during initialization, changing the active uplinks requires saving the configuration and reloading the switch. When you are configuring a change to the uplinks, the system responds with a message informing you that the switch must be reloaded, and suggests the appropriate command (depending on redundancy mode) to reload the switch.

A **no** form of this command does not exist. To undo the configuration, you must configure the uplinks.

Examples

This example shows how to select the Gigabit Ethernet uplinks:

```
Switch(config)# hw-module uplink select gigabitethernet
A reload of the active supervisor is required to apply the new configuration.
Switch(config)#
```



Note

The Gigabit Ethernet uplinks will be active after the next reload.

This example shows how to select the Gigabit Ethernet uplinks in a redundant system in SSO mode:

```
Switch(config)# hw-module uplink select gigabitethernet
A 'redundancy reload shelf' or power-cycle of chassis is required to apply the new
configuration
Switch(config)#
```



Note

The Gigabit Ethernet uplinks will be active after the next reload of the chassis/shelf. Use the **redundancy reload shelf** command to reload the chassis/shelf.

This example shows how to select the Gigabit Ethernet uplinks in a redundant system in RPR mode:

```
Switch(config)# hw-module uplink select gigabitethernet
```

A reload of the active supervisor is required to apply the new configuration.

```
Switch(config)#
```

**Note**

The Gigabit Ethernet uplinks will be active on a switchover or reload of the active supervisor engine.

Related Commands

[show hw-module uplink](#)

instance

To map a VLAN or a set of VLANs to an MST instance, use the **instance** command. To return the VLANs to the common instance default, use the **no** form of this command.

instance *instance-id* { **vlan** *vlan-range* }

no instance *instance-id*

Syntax Description	<i>instance-id</i>	MST instance to which the specified VLANs are mapped; valid values are from 0 to 15.
	vlan <i>vlan-range</i>	Specifies the number of the VLANs to be mapped to the specified instance. The number is entered as a single value or a range; valid values are from 1 to 4094.

Defaults Mapping is disabled.

Command Modes MST configuration

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

Usage Guidelines The mapping is incremental, not absolute. When you enter a range of VLANs, this range is added or removed to the existing ones.

Any unmapped VLAN is mapped to the CIST instance.

Examples This example shows how to map a range of VLANs to instance 2:

```
Switch(config-mst)# instance 2 vlan 1-100
Switch(config-mst)#
```

This example shows how to map a VLAN to instance 5:

```
Switch(config-mst)# instance 5 vlan 1100
Switch(config-mst)#
```

This example shows how to move a range of VLANs from instance 2 to the CIST instance:

```
Switch(config-mst)# no instance 2 vlan 40-60
Switch(config-mst)#
```

This example shows how to move all the VLANs mapped to instance 2 back to the CIST instance:

```
Switch(config-mst)# no instance 2
Switch(config-mst)#
```

Related Commands

[name](#)
[revision](#)
[show spanning-tree mst](#)
[spanning-tree mst configuration](#)

■ instance