



Interface and Hardware Commands

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client vlan

To configure a WLAN interface or an interface group, use the **client vlan** command. To disable the WLAN interface, use the **no** form of this command.

```
client vlan interface-id-name-or-group-name
no client vlan
```

Syntax Description	<i>interface-id-name-or-group-name</i> Interface ID, name, or VLAN group name. The interface ID can also be in digits too.
Command Default	The default interface is configured.
Command Modes	WLAN configuration
Command History	<p>Release Modification</p> <p>This command was introduced.</p>
Usage Guidelines	<p>You must disable the WLAN before using this command. See Related Commands section for more information on how to disable a WLAN.</p> <p>This example shows how to enable a client VLAN on a WLAN:</p> <pre># configure terminal Enter configuration commands, one per line. End with CNTL/Z. (config)# wlan wlan1 (config-wlan)# client vlan client-vlan1 (config-wlan)# end</pre> <p>This example shows how to disable a client VLAN on a WLAN:</p> <pre># configure terminal Enter configuration commands, one per line. End with CNTL/Z. (config)# wlan wlan1 (config-wlan)# no client vlan (config-wlan)# end</pre>

debug ilpower

To enable debugging of the power controller and Power over Ethernet (PoE) system, use the **debug ilpower** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ilpower **cdp** | **controller** | **event** | **ha** | **port** | **powerman** | **registries** | **scp** | **sense**
no debug ilpower **cdp** | **controller** | **event** | **ha** | **port** | **powerman** | **registries** | **scp** | **sense**

Syntax Description

cdp	Displays PoE Cisco Discovery Protocol (CDP) debug messages.
controller	Displays PoE controller debug messages.
event	Displays PoE event debug messages.
ha	Displays PoE high-availability messages.
port	Displays PoE port manager debug messages.
powerman	Displays PoE power management debug messages.
registries	Displays PoE registries debug messages.
scp	Displays PoE SCP debug messages.
sense	Displays PoE sense debug messages.

Command Default

Debugging is disabled.

Command Modes

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

This command is supported only on PoE-capable switches.

When you enable debugging on a switch stack, it is enabled only on the active switch. To enable debugging on a member switch, you can start a session from the active switch by using the **session** *switch-number* EXEC command. Then enter the **debug** command at the command-line prompt of the member switch. You also can use the **remote command** *stack-member-number* *LINE* EXEC command on the active switch to enable debugging on a member switch without first starting a session.

debug interface

To enable debugging of interface-related activities, use the **debug interface** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

```
debug interface interface-id | counters exceptions | protocol memory | null interface-number |
port-channel port-channel-number | states | vlan vlan-id
no debug interface interface-id | counters exceptions | protocol memory | null interface-number |
port-channel port-channel-number | states | vlan vlan-id
```

Syntax Description

<i>interface-id</i>	ID of the physical interface. Displays debug messages for the specified physical port, identified by type switch number/module number/port, for example, gigabitethernet 1/0/2.
null <i>interface-number</i>	Displays debug messages for null interfaces. The interface number is always 0 .
port-channel <i>port-channel-number</i>	Displays debug messages for the specified EtherChannel port-channel interface. The <i>port-channel-number</i> range is 1 to 48.
vlan <i>vlan-id</i>	Displays debug messages for the specified VLAN. The vlan range is 1 to 4094.
counters	Displays counters debugging information.
exceptions	Displays debug messages when a recoverable exceptional condition occurs during the computation of the interface packet and data rate statistics.
protocol memory	Displays debug messages for memory operations of protocol counters.
states	Displays intermediary debug messages when an interface's state transitions.

Command Default

Debugging is disabled.

Command Modes

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

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

The **undebug interface** command is the same as the **no debug interface** command.

When you enable debugging on a switch stack, it is enabled only on the active switch. To enable debugging on a member switch, you can start a session from the active switch by using the **session** *switch-number* EXEC command. Then enter the **debug** command at the command-line prompt of the member switch. You also can use the **remote command** *stack-member-number* *LINE* EXEC command on the active switch to enable debugging on a member switch without first starting a session.

debug lldp packets

To enable debugging of Link Layer Discovery Protocol (LLDP) packets, use the **debug lldp packets** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug lldp packets
no debug lldp packets

Syntax Description This command has no arguments or keywords.

Command Default Debugging is disabled.

Command Modes Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Usage Guidelines The **undebug lldp packets** command is the same as the **no debug lldp packets** command. When you enable debugging on a switch stack, it is enabled only on the . To enable debugging on a member switch, you can start a session from the by using the **session *switch-number*** EXEC command.

debug nmsp

To enable debugging of the Network Mobility Services Protocol (NMSP) on the switch, use the **debug nmsp** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

Syntax Description		
	all	Displays all NMSP debug messages.
	connection	Displays debug messages for NMSP connection events.
	error	Displays debugging information for NMSP error messages.
	event	Displays debug messages for NMSP events.
	rx	Displays debugging information for NMSP receive messages.
	tx	Displays debugging information for NMSP transmit messages.
	packet	Displays debug messages for NMSP packet events.

Command Default Debugging is disabled.

Command Modes Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Usage Guidelines



Note Attachment information is not supported in Cisco IOS XE Denali 16.1.1 and later releases.

The **undebbug nmsp** command is the same as the **no debug nmsp** command.

When you enable debugging on a switch stack, it is enabled only on the active switch. To enable debugging on a member switch, you can start a session from the active switch by using the **session switch-number EXEC** command. Then enter the **debug** command at the command-line prompt of the member switch. You also can use the **remote command stack-member-number LINE EXEC** command on the active switch to enable debugging on a member switch without first starting a session.

debug platform poe

To enable debugging of a Power over Ethernet (PoE) port, use the **debug platform poe** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

```
debug platform poe [error | info] [switch switch-number]
no debug platform poe [error | info] [switch switch-number]
```

Syntax Description

error	(Optional) Displays PoE-related error debug messages.
info	(Optional) Displays PoE-related information debug messages.
switch <i>switch-number</i>	(Optional) Specifies the stack member. This keyword is supported only on stacking-capable switches.

Command Default

Debugging is disabled.

Command Modes

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

The **undebug platform poe** command is the same as the **no debug platform poe** command.

duplex

To specify the duplex mode of operation for a port, use the **duplex** command in interface configuration mode. To return to the default value, use the **no** form of this command.

duplex **auto** | **full** | **half**
no duplex **auto** | **full** | **half**

Syntax Description

auto Enables automatic duplex configuration. The port automatically detects whether it should run in full- or half-duplex mode, depending on the attached device mode.

full Enables full-duplex mode.

half Enables half-duplex mode (only for interfaces operating at 10 or 100 Mbps). You cannot configure half-duplex mode for interfaces operating at 1000 or 10,000 Mbps.

Command Default

For Gigabit Ethernet ports, the default is **auto**.

Command Modes

Interface configuration (config-if)

Command History

Release

Modification

This command was introduced.

Usage Guidelines

For Gigabit Ethernet ports, setting the port to **auto** has the same effect as specifying **full** if the attached device does not autonegotiate the duplex parameter.

Duplex options are not supported on the 1000BASE-*x* or 10GBASE-*x* (where *x* is -BX, -CWDM, -LX, -SX, or -ZX) small form-factor pluggable (SFP) modules.



Note

Half-duplex mode is supported on Gigabit Ethernet interfaces if the duplex mode is **auto** and the connected device is operating at half duplex. However, you cannot configure these interfaces to operate in half-duplex mode.

Certain ports can be configured to be either full duplex or half duplex. How this command is applied depends on the device to which the switch is attached.

If both ends of the line support autonegotiation, we highly recommend using the default autonegotiation settings. If one interface supports autonegotiation and the other end does not, configure duplex and speed on both interfaces, and use the **auto** setting on the supported side.

If the speed is set to **auto**, the switch negotiates with the device at the other end of the link for the speed setting and then forces the speed setting to the negotiated value. The duplex setting remains as configured on each end of the link, which could result in a duplex setting mismatch.

You can configure the duplex setting when the speed is set to **auto**.

**Caution**

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

You can verify your setting by entering the **show interfaces** privileged EXEC command.

Examples

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

```
Device> enable
Device# configure terminal
Device(config)# interface gigabitethernet 1/0/1
Device(config-if)# duplex full
```

errdisable detect cause

To enable error-disable detection for a specific cause or for all causes, use the **errdisable detect cause** command in global configuration mode. To disable the error-disable detection feature, use the **no** form of this command.

```
errdisable detect cause all | arp-inspection | bpduguard shutdown vlan | dhcp-rate-limit | dtp-flap
| gbic-invalid | inline-power | link-flap | loopback | pagp-flap | pppoe-ia-rate-limit | psp shutdown
vlan | security-violation shutdown vlan | sfp-config-mismatch
no errdisable detect cause all | arp-inspection | bpduguard shutdown vlan | dhcp-rate-limit | dtp-flap
| gbic-invalid | inline-power | link-flap | loopback | pagp-flap | pppoe-ia-rate-limit | psp shutdown
vlan | security-violation shutdown vlan | sfp-config-mismatch
```

Syntax	Description
all	Enables error detection for all error-disabled causes.
arp-inspection	Enables error detection for dynamic Address Resolution Protocol (ARP) inspection.
bpduguard shutdown vlan	Enables per-VLAN error-disable for BPDU guard.
dhcp-rate-limit	Enables error detection for DHCP snooping.
dtp-flap	Enables error detection for the Dynamic Trunking Protocol (DTP) flapping.
gbic-invalid	Enables error detection for an invalid Gigabit Interface Converter (GBIC) module. Note This error refers to an invalid small form-factor pluggable (SFP) module.
inline-power	Enables error detection for the Power over Ethernet (PoE) error-disabled cause. Note This keyword is supported only on switches with PoE ports.
link-flap	Enables error detection for link-state flapping.
loopback	Enables error detection for detected loopbacks.
pagp-flap	Enables error detection for the Port Aggregation Protocol (PAgP) flap error-disabled cause.
pppoe-ia-rate-limit	Enables error detection for the PPPoE Intermediate Agent rate-limit error-disabled cause.
psp shutdown vlan	Enables error detection for protocol storm protection (PSP).
security-violation shutdown vlan	Enables voice aware 802.1x security.
sfp-config-mismatch	Enables error detection on an SFP configuration mismatch.

Command Default Detection is enabled for all causes. All causes, except per-VLAN error disabling, are configured to shut down the entire port.

Command Modes Global configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines A cause (such as a link-flap or dhcp-rate-limit) is the reason for the error-disabled state. When a cause is detected on an interface, the interface is placed in an error-disabled state, an operational state that is similar to a link-down state.

When a port is error-disabled, it is effectively shut down, and no traffic is sent or received on the port. For the bridge protocol data unit (BPDU) guard, voice-aware 802.1x security, and port-security features, you can configure the switch to shut down only the offending VLAN on the port when a violation occurs, instead of shutting down the entire port.

If you set a recovery mechanism for the cause by entering the **errdisable recovery** global configuration command, the interface is brought out of the error-disabled state and allowed to retry the operation when all causes have timed out. If you do not set a recovery mechanism, you must enter the **shutdown** and then the **no shutdown** commands to manually recover an interface from the error-disabled state.

For protocol storm protection, excess packets are dropped for a maximum of two virtual ports. Virtual port error disabling using the **psp** keyword is not supported for EtherChannel and Flexlink interfaces.

To verify your settings, enter the **show errdisable detect** privileged EXEC command.

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

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

This command shows how to globally configure BPDU guard for a per-VLAN error-disabled state:

```
(config)# errdisable detect cause bpduguard shutdown vlan
```

This command shows how to globally configure voice-aware 802.1x security for a per-VLAN error-disabled state:

```
(config)# errdisable detect cause security-violation shutdown vlan
```

You can verify your setting by entering the **show errdisable detect** privileged EXEC command.

errdisable recovery cause

To enable the error-disabled mechanism to recover from a specific cause, use the **errdisable recovery cause** command in global configuration mode. 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 | inline-power | link-flap | loopback | mac-limit | pagp-flap | port-mode-failure |
pppoe-ia-rate-limit | psecure-violation | psp | security-violation | sfp-config-mismatch | storm-control |
udld
```

```
no errdisable recovery cause all | arp-inspection | bpduguard | channel-misconfig | dhcp-rate-limit |
dtp-flap | gbic-invalid | inline-power | link-flap | loopback | mac-limit | pagp-flap | port-mode-failure |
pppoe-ia-rate-limit | psecure-violation | psp | security-violation | sfp-config-mismatch | storm-control |
udld
```

Syntax Description		
all		Enables the timer to recover from all error-disabled causes.
arp-inspection		Enables the timer to recover from the Address Resolution Protocol (ARP) inspection error-disabled state.
bpduguard		Enables the timer to recover from the bridge protocol data unit (BPDU) guard error-disabled state.
channel-misconfig		Enables the timer to recover from the EtherChannel misconfiguration error-disabled state.
dhcp-rate-limit		Enables the timer to recover from the DHCP snooping error-disabled state.
dtp-flap		Enables the timer to recover from the Dynamic Trunking Protocol (DTP) flap error-disabled state.
gbic-invalid		Enables the timer to recover from an invalid Gigabit Interface Converter (GBIC) module error-disabled state.
	Note	This error refers to an invalid small form-factor pluggable (SFP) error-disabled state.
inline-power		Enables the timer to recover from the Power over Ethernet (PoE) error-disabled state.
		This keyword is supported only on switches with PoE ports.
link-flap		Enables the timer to recover from the link-flap error-disabled state.
loopback		Enables the timer to recover from a loopback error-disabled state.
mac-limit		Enables the timer to recover from the mac limit error-disabled state.
pagp-flap		Enables the timer to recover from the Port Aggregation Protocol (PAgP)-flap error-disabled state.

port-mode-failure	Enables the timer to recover from the port mode change failure error-disabled state.
pppoe-ia-rate-limit	Enables the timer to recover from the PPPoE IA rate limit error-disabled state.
psecure-violation	Enables the timer to recover from a port security violation disable state.
psp	Enables the timer to recover from the protocol storm protection (PSP) error-disabled state.
security-violation	Enables the timer to recover from an IEEE 802.1x-violation disabled state.
sfp-config-mismatch	Enables error detection on an SFP configuration mismatch.
storm-control	Enables the timer to recover from a storm control error.
udld	Enables the timer to recover from the UniDirectional Link Detection (UDLD) error-disabled state.

Command Default Recovery is disabled for all causes.

Command Modes Global configuration

Command History

Release

Modification

This command was introduced.

Usage Guidelines

A cause (such as all or BPDU guard) is defined as the reason that the error-disabled state occurred. When a cause is detected on an interface, the interface is placed in the error-disabled state, an operational state similar to link-down state.

When a port is error-disabled, it is effectively shut down, and no traffic is sent or received on the port. For the BPDU guard and port-security features, you can configure the switch to shut down only the offending VLAN on the port when a violation occurs, instead of shutting down the entire port.

If you do not enable the recovery for the cause, the interface stays in the error-disabled state until you enter the **shutdown** and the **no shutdown** interface configuration commands. If you enable the recovery for a cause, the interface is brought out of the error-disabled state and allowed to retry the operation again when all the causes have timed out.

Otherwise, you must enter the **shutdown** and then the **no shutdown** commands to manually recover an interface from the error-disabled state.

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

Examples

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

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

errdisable recovery interval

To specify the time to recover from an error-disabled state, use the **errdisable recovery interval** command in global configuration mode. To return to the default setting, use the **no** form of this command.

errdisable recovery interval *timer-interval*
no errdisable recovery interval *timer-interval*

Syntax Description

timer-interval Time to recover from the error-disabled state. The range is 30 to 86400 seconds. The same interval is applied to all causes. The default interval is 300 seconds.

Command Default

The default recovery interval is 300 seconds.

Command Modes

Global configuration

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

The error-disabled recovery timer is initialized at a random differential from the configured interval value. The difference between the actual timeout value and the configured value can be up to 15 percent of the configured interval.

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

Examples

This example shows how to set the timer to 500 seconds:

```
(config)# errdisable recovery interval 500
```

interface

To configure an interface, use the **interface** command.

interface **Auto-Template** *interface-number* | **Capwap** *Capwap interface-number* | **GigabitEthernet** *switch-number/slot-number/port-number* | **Group VI** *Group VI interface number* | **Internal Interface** *Internal Interface number* | **Loopback** *interface-number* **Null** *interface-number* **Port-channel** *interface-number* **TenGigabitEthernet** *switch-number/slot-number/port-number* **Tunnel** *interface-number* **Vlan** *interface-number*

Auto-Template <i>interface-number</i>	Enables you to configure a auto-template interface. The range is from 1 to 999.
Capwap <i>Capwap interface number</i>	Enables you to configure a Control and Provisioning of Wireless Access Points (CAPWAP) tunnel interface. The range is from 0 to 2147483647.
GigabitEthernet <i>switch-number/slot-number/port-number</i>	Enables you to configure a Gigabit Ethernet IEEE 802.3z interface. The range is from 0 to 9
Group VI <i>Group VI interface number</i>	Enables you to configure a Group VI interface. The range is from 0 to 9.
Internal Interface <i>Internal Interface</i>	Enables you to configure an internal interface.
Loopback <i>interface-number</i>	Enables you to configure a loopback interface. The range is from 0 to 2147483647.
Null <i>interface-number</i>	Enables you to configure a null interface. The default value is 0.
Port-channel <i>interface-number</i>	Enables you to configure a port-channel interface. The range is from 1 to 128.
TenGigabitEthernet <i>switch-number/slot-number/port-number</i>	Enables you to configure a 10-Gigabit Ethernet interface. <ul style="list-style-type: none"> • <i>switch-number</i> — Switch ID. The range is from 1 to 8. • <i>slot-number</i> — Slot number. The range is from 0 to 1. • <i>port-number</i> — Port number. The range is from 1 to 24 and 37 to 48
Tunnel <i>interface-number</i>	Enables you to configure a tunnel interface. The range is from 0 to 2147483647.
Vlan <i>interface-number</i>	Enables you to configure a switch VLAN. The range is from 1 to 4094.

Command Default None

Command Modes Global configuration

Command History **Release** **Modification**

 This command was introduced.

Usage Guidelines You can not use the "no" form of this command.

The following example shows how to configure a tunnel interface:

```
# interface Tunnel 15
```

interface range

To configure an interface range, use the **interface range** command.

interface range **Auto-Template** *interface-number* | **GigabitEthernet** *switch-number/slot-number/port-number* | **Loopback** *interface-number* | **Null** *interface-number* | **Port-channel** *interface-number* | **TenGigabitEthernet** *switch-number/slot-number/port-number* | **Tunnel** *interface-number* | **Vlan** *interface-number*

Auto-Template <i>interface-number</i>	Enables you to configure an auto-template interface. The range is from 1 to 999.
GigabitEthernet <i>switch-number/slot-number/port-number</i>	Enables you to configure a Gigabit Ethernet IEEE 802.3z interface. <ul style="list-style-type: none"> • <i>switch-number</i>— Switch ID. The range is from 1 to 8. • <i>slot-number</i> — Slot number. The range is from 0 to 1. • <i>port-number</i> — Port number. The range is from 1 to 48.
Loopback <i>interface-number</i>	Enables you to configure a loopback interface. The range is from 0 to 2147483647.
Null <i>interface-number</i>	Enables you to configure a null interface. The default value is 0.
Port-channel <i>interface-number</i>	Enables you to configure a port-channel interface. The range is from 1 to 128.
TenGigabitEthernet <i>switch-number/slot-number/port-number</i>	Enables you to configure a 10-Gigabit Ethernet interface. <ul style="list-style-type: none"> • <i>switch-number</i>— Switch ID. The range is from 1 to 8. • <i>slot-number</i>— Slot number. The range is from 0 to 1. • <i>port-number</i>— Port number. The range is from 1 to 24 and 37 to 48.
Tunnel <i>interface-number</i>	Enables you to configure a tunnel interface. The range is from 0 to 2147483647.
Vlan <i>interface-number</i>	Enables you to configure a switch VLAN. The range is from 1 to 4094.

Command Default None

Command Modes Global configuration

Command History **Release Modification**

This command was introduced.

This example shows how you can configure interface range:

```
(config)# interface range vlan 1-100
```

ip mtu

To set the IP maximum transmission unit (MTU) size of routed packets on all routed ports of the switch or switch stack, use the **ip mtu** command in interface configuration mode. To restore the default IP MTU size, use the **no** form of this command.

```
ip mtu bytes
no ip mtu bytes
```

Syntax Description	<i>bytes</i> MTU size, in bytes. The range is from 68 up to the system MTU value (in bytes).	
Command Default	The default IP MTU size for frames received and sent on all switch interfaces is 1500 bytes.	
Command Modes	Interface configuration	
Command History	Release	Modification
		This command was introduced.

Usage Guidelines The upper limit of the IP value is based on the switch or switch stack configuration and refers to the currently applied system MTU value. For more information about setting the MTU sizes, see the **system mtu** global configuration command.

To return to the default IP MTU setting, you can apply the **default ip mtu** command or the **no ip mtu** command on the interface.

You can verify your setting by entering the **show ip interface** *interface-id* or **show interfaces** *interface-id* privileged EXEC command.

The following example sets the maximum IP packet size for VLAN 200 to 1000 bytes:

```
(config)# interface vlan 200
(config-if)# ip mtu 1000
```

The following example sets the maximum IP packet size for VLAN 200 to the default setting of 1500 bytes:

```
(config)# interface vlan 200
(config-if)# default ip mtu
```

This is an example of partial output from the **show ip interface** *interface-id* command. It displays the current IP MTU setting for the interface.

```
# show ip interface gigabitethernet4/0/1
GigabitEthernet4/0/1 is up, line protocol is up
  Internet address is 18.0.0.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
```

<output truncated>

ipv6 mtu

To set the IPv6 maximum transmission unit (MTU) size of routed packets on all routed ports of the switch or switch stack, use the **ipv6 mtu** command in interface configuration mode. To restore the default IPv6 MTU size, use the **no** form of this command.

ipv6 mtu *bytes*
no ipv6 mtu *bytes*

Syntax Description	<i>bytes</i> MTU size, in bytes. The range is from 1280 up to the system MTU value (in bytes).				
Command Default	The default IPv6 MTU size for frames received and sent on all switch interfaces is 1500 bytes.				
Command Modes	Interface configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

Usage Guidelines The upper limit of the IPv6 MTU value is based on the switch or switch stack configuration and refers to the currently applied system MTU value. For more information about setting the MTU sizes, see the **system mtu** global configuration command.

To return to the default IPv6 MTU setting, you can apply the **default ipv6 mtu** command or the **no ipv6 mtu** command on the interface.

You can verify your setting by entering the **show ipv6 interface** *interface-id* or **show interface** *interface-id* privileged EXEC command.

The following example sets the maximum IPv6 packet size for an interface to 2000 bytes:

```
(config)# interface gigabitethernet4/0/1
(config-if)# ipv6 mtu 2000
```

The following example sets the maximum IPv6 packet size for an interface to the default setting of 1500 bytes:

```
(config)# interface gigabitethernet4/0/1
(config-if)# default ipv6 mtu
```

This is an example of partial output from the **show ipv6 interface** *interface-id* command. It displays the current IPv6 MTU setting for the interface.

```
# show ipv6 interface gigabitethernet4/0/1
GigabitEthernet4/0/1 is up, line protocol is up
 Internet address is 18.0.0.1/24
 Broadcast address is 255.255.255.255
 Address determined by setup command
 MTU is 1500 bytes
 Helper address is not set
```

<output truncated>

lldp (interface configuration)

To enable Link Layer Discovery Protocol (LLDP) on an interface, use the **lldp** command in interface configuration mode. To disable LLDP on an interface, use the **no** form of this command.

Syntax Description		
med-tlv-select		Selects an LLDP Media Endpoint Discovery (MED) time-length-value (TLV) element to send.
<i>tlv</i>		String that identifies the TLV element. Valid values are the following: <ul style="list-style-type: none"> • inventory-management— LLDP MED Inventory Management TLV. • location— LLDP MED Location TLV. • network-policy— LLDP MED Network Policy TLV.
receive		Enables the interface to receive LLDP transmissions.
tlv-select		Selects the LLDP TLVs to send.
power-management		Sends the LLDP Power Management TLV.
transmit		Enables LLDP transmission on the interface.

Command Default LLDP is disabled.

Command Modes Interface configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines This command is supported on 802.1 media types.
 If the interface is configured as a tunnel port, LLDP is automatically disabled.
 The following example shows how to disable LLDP transmission on an interface:

```
(config)# interface gigabitethernet1/0/1
(config-if)# no lldp transmit
```

The following example shows how to enable LLDP transmission on an interface:

```
(config)# interface gigabitethernet1/0/1
(config-if)# lldp transmit
```

logging event power-inline-status

To enable the logging of Power over Ethernet (PoE) events, use the **logging event power-inline-status** command in interface configuration mode. To disable the logging of PoE status events, use the **no** form of this command.

logging event power-inline-status
no logging event power-inline-status

Syntax Description This command has no arguments or keywords.

Command Default Logging of PoE events is enabled.

Command Modes Interface configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines The **no** form of this command does not disable PoE error events.

Examples This example shows how to enable logging of PoE events on a port:

```
(config-if)# interface gigabitethernet1/0/1
(config-if)# logging event power-inline-status
(config-if)#
```

mdix auto

To enable the automatic medium-dependent interface crossover (auto-MDIX) feature on the interface, use the **mdix auto** command in interface configuration mode. To disable auto-MDIX, use the **no** form of this command.

mdix auto
no mdix auto

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

Command Default	Auto-MDIX is enabled.
------------------------	-----------------------

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

Command History	Release	Modification
		This command was introduced.

Usage Guidelines	<p>When auto-MDIX is enabled, the interface automatically detects the required cable connection type (straight-through or crossover) and configures the connection appropriately.</p> <p>When you enable auto-MDIX on an interface, you must also set the interface speed and duplex to auto so that the feature operates correctly.</p> <p>When auto-MDIX (and autonegotiation of speed and duplex) is enabled on one or both of the connected interfaces, link up occurs, even if the cable type (straight-through or crossover) is incorrect.</p> <p>Auto-MDIX is supported on all 10/100 and 10/100/1000 Mb/s interfaces and on 10/100/1000BASE-TX small form-factor pluggable (SFP) module interfaces. It is not supported on 1000BASE-SX or -LX SFP module interfaces.</p> <p>You can verify the operational state of auto-MDIX on the interface by entering the show controllers ethernet-controller interface-id phy privileged EXEC command.</p>
-------------------------	---

This example shows how to enable auto-MDIX on a port:

```
# configure terminal
(config)# interface gigabitethernet1/0/1
(config-if)# speed auto
(config-if)# duplex auto
(config-if)# mdix auto
(config-if)# end
```

mode (power-stack configuration)

To configure power stack mode for the power stack, use the **mode** command in power-stack configuration mode. To return to the default settings, use the **no** form of the command.

mode **power-shared** | **redundant** [**strict**]
no mode

Syntax Description		
	power-shared	Sets the power stack to operate in power-shared mode. This is the default.
	redundant	Sets the power stack to operate in redundant mode. The largest power supply is removed from the power pool to be used as backup power in case one of the other power supplies fails.
	strict	(Optional) Configures the power stack mode to run a strict power budget. The stack power needs cannot exceed the available power.

Command Default The default modes are **power-shared** and nonstrict.

Command Modes Power-stack configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines This command is available only on switch stacks running the IP Base or IP Services feature set. To access power-stack configuration mode, enter the **stack-power stack** *power stack name* global configuration command.

Entering the **no mode** command sets the switch to the defaults of **power-shared** and non-strict mode.



Note For stack power, available power is the total power available for PoE from all power supplies in the power stack, available power is the power allocated to all powered devices connected to PoE ports in the stack, and consumed power is the actual power consumed by the powered devices.

In **power-shared** mode, all of the input power can be used for loads, and the total available power appears as one large power supply. The power budget includes all power from all supplies. No power is set aside for power supply failures. If a power supply fails, load shedding (shutting down of powered devices or switches) might occur.

In **redundant** mode, the largest power supply is removed from the power pool to use as backup power in case one of the other power supplies fails. The available power budget is the total power minus the largest power supply. This reduces the available power in the pool for switches and powered devices, but in case of a failure or an extreme power load, there is less chance of having to shut down switches or powered devices.

In **strict** mode, when a power supply fails and the available power drops below the budgeted power, the system balances the budget through load shedding of powered devices, even if the actual power is less than the available power. In nonstrict mode, the power stack can run in an over-allocated state and is stable as long as

the actual power does not exceed the available power. In this mode, a powered device drawing more than normal power could cause the power stack to start shedding loads. This is normally not a problem because most devices do not run at full power. The chances of multiple powered devices in the stack requiring maximum power at the same time is small.

In both strict and nonstrict modes, power is denied when there is no power available in the power budget.

This is an example of setting the power stack mode for the stack named power1 to power-shared with strict power budgeting. All power in the stack is shared, but when the total available power is allotted, no more devices are allowed power.

```
(config)# stack-power stack power1  
(config-stackpower)# mode power-shared strict  
(config-stackpower)# exit
```

This is an example of setting the power stack mode for the stack named power2 to redundant. The largest power supply in the stack is removed from the power pool to provide redundancy in case one of the other supplies fails.

```
(config)# stack-power stack power2  
(config-stackpower)# mode redundant  
(config-stackpower)# exit
```

network-policy

To apply a network-policy profile to an interface, use the **network-policy** command in interface configuration mode. To remove the policy, use the **no** form of this command.

```
network-policy profile-number
no network-policy
```

Syntax Description

profile-number The network-policy profile number to apply to the interface.

Command Default

No network-policy profiles are applied.

Command Modes

Interface configuration

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

Use the **network-policy** *profile number* interface configuration command to apply a profile to an interface.

You cannot apply the **switchport voice vlan** command on an interface if you first configure a network-policy profile on it. However, if **switchport voice vlan** *vlan-id* is already configured on the interface, you can apply a network-policy profile on the interface. The interface then has the voice or voice-signaling VLAN network-policy profile applied.

This example shows how to apply network-policy profile 60 to an interface:

```
(config)# interface gigabitethernet1/0/1
(config-if)# network-policy 60
```

network-policy profile (global configuration)

To create a network-policy profile and to enter network-policy configuration mode, use the **network-policy profile** command in global configuration mode. To delete the policy and to return to global configuration mode, use the **no** form of this command.

network-policy profile *profile-number*
no network-policy profile *profile-number*

Syntax Description	<i>profile-number</i> Network-policy profile number. The range is 1 to 4294967295.				
Command Default	No network-policy profiles are defined.				
Command Modes	Global configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

Usage Guidelines Use the **network-policy profile** global configuration command to create a profile and to enter network-policy profile configuration mode.

To return to privileged EXEC mode from the network-policy profile configuration mode, enter the **exit** command.

When you are in network-policy profile configuration mode, you can create the profile for voice and voice signaling by specifying the values for VLAN, class of service (CoS), differentiated services code point (DSCP), and tagging mode.

These profile attributes are contained in the Link Layer Discovery Protocol for Media Endpoint Devices (LLDP-MED) network-policy time-length-value (TLV).

This example shows how to create network-policy profile 60:

```
(config)# network-policy profile 60
(config-network-policy)#
```

nmosp attachment suppress

To suppress the reporting of attachment information from a specified interface, use the **nmosp attachment suppress** command in interface configuration mode. To return to the default setting, use the **no** form of this command.

nmosp attachment suppress
no nmosp attachment suppress

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Interface configuration (config-if)

Command History	Release	Modification
		This command was introduced.

Usage Guidelines Use the **nmosp attachment suppress** interface configuration command to configure an interface to not send location and attachment notifications to a Cisco Mobility Services Engine (MSE).



Note Attachment information is not supported in Cisco IOS XE Denali 16.1.1 and later releases.

This example shows how to configure an interface to not send attachment information to the MSE:

```
(config)# interface gigabitethernet1/0/1
(config-if)# nmosp attachment suppress
```

power-priority

To configure Cisco StackPower power-priority values for a switch in a power stack and for its high-priority and low-priority PoE ports, use the **power-priority** command in switch stack-power configuration mode. To return to the default setting, use the **no** form of the command.

power-priority high *value* | **low** *value* | **switch** *value*
no power-priority high | **low** | **switch**

Syntax Description	
high <i>value</i>	Sets the power priority for the ports configured as high-priority ports. The range is 1 to 27, with 1 as the highest priority. The high value must be lower than the value set for the low-priority ports and higher than the value set for the switch.
low <i>value</i>	Sets the power priority for the ports configured as low-priority ports. The range is 1 to 27. The low value must be higher than the value set for the high-priority ports and the value set for the switch.
switch <i>value</i>	Sets the power priority for the switch. The range is 1 to 27. The switch value must be lower than the values set for the low and high-priority ports.

Command Default	
	If no values are configured, the power stack randomly determines a default priority. The default ranges are 1 to 9 for switches, 10 to 18 for high-priority ports, 19 to 27 for low-priority ports. On non-PoE switches, the high and low values (for port priority) have no effect.

Command Modes	
	Switch stack-power configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines	
	To access switch stack-power configuration mode, enter the stack-power switch <i>switch-number</i> global configuration command.
	Cisco StackPower power-priority values determine the order for shutting down switches and ports when power is lost and load shedding must occur. Priority values are from 1 to 27; the highest numbers are shut down first.
	We recommend that you configure different priority values for each switch and for its high priority ports and low priority ports to limit the number of devices shut down at one time during a loss of power. If you try to configure the same priority value on different switches in a power stack, the configuration is allowed, but you receive a warning message.



Note	
	This command is available only on switch stacks running the IP Base or IP Services feature set.

Examples	
	This is an example of setting the power priority for switch 1 in power stack a to 7, for the high-priority ports to 11, and for the low-priority ports to 20.

```
(config)# stack-power switch 1  
(config-switch-stackpower)# stack-id power_stack_a  
(config-switch-stackpower)# power-priority high 11  
(config-switch-stackpower)# power-priority low 20  
(config-switch-stackpower)# power-priority switch 7  
(config-switch-stackpower)# exit
```

power inline

To configure the power management mode on Power over Ethernet (PoE) ports, use the **power inline** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

power inline auto [**max** *max-wattage*] | **never** | **port priority high | low** | **static** [**max** *max-wattage*]
no power inline auto | **never** | **port priority high | low** | **static** [**max** *max-wattage*]

Syntax Description		
auto		Enables powered-device detection. If enough power is available, automatically allocates power to the PoE port after device detection. Allocation is first-come, first-serve.
max <i>max-wattage</i>		(Optional) Limits the power allowed on the port. The range is 4000 to 30000 mW. If no value is specified, the maximum is allowed.
never		Disables device detection, and disables power to the port.
port		Configures the power priority of the port. The default priority is low.
priority { high low }		Sets the power priority of the port. In case of a power supply failure, ports configured as low priority are turned off first and ports configured as high priority are turned off last. The default priority is low.
static		Enables powered-device detection. Pre-allocates (reserves) power for a port before the switch discovers the powered device. This action guarantees that the device connected to the interface receives enough power.

Command Default The default is **auto** (enabled).
 The maximum wattage is 30,000 mW.
 The default port priority is low.

Command Default Interface configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines

This command is supported only on PoE-capable ports. If you enter this command on a port that does not support PoE, this error message appears:

```
(config)# interface gigabitethernet1/0/1
(config-if)# power inline auto
                ^
% Invalid input detected at '^' marker.
```

In a switch stack, this command is supported on all ports in the stack that support PoE.

Use the **max** *max-wattage* option to disallow higher-power powered devices. With this configuration, when the powered device sends Cisco Discovery Protocol (CDP) messages requesting more power than the maximum wattage, the switch removes power from the port. If the powered-device IEEE class maximum is greater than the maximum wattage, the switch does not power the device. The power is reclaimed into the global power budget.



Note The switch never powers any class 0 or class 3 device if the **power inline max max-wattage** command is configured for less than 30 W.

If the switch denies power to a powered device (the powered device requests more power through CDP messages or if the IEEE class maximum is greater than the maximum wattage), the PoE port is in a power-deny state. The switch generates a system message, and the Oper column in the **show power inline** privileged EXEC command output shows *power-deny*.

Use the **power inline static max max-wattage** command to give a port high priority. The switch allocates PoE to a port configured in static mode before allocating power to a port configured in auto mode. The switch reserves power for the static port when it is configured rather than upon device discovery. The switch reserves the power on a static port even when there is no connected device and whether or not the port is in a shutdown or in a no shutdown state. The switch allocates the configured maximum wattage to the port, and the amount is never adjusted through the IEEE class or by CDP messages from the powered device. Because power is pre-allocated, any powered device that uses less than or equal to the maximum wattage is guaranteed power when it is connected to a static port. However, if the powered device IEEE class is greater than the maximum wattage, the switch does not supply power to it. If the switch learns through CDP messages that the powered device needs more than the maximum wattage, the powered device is shut down.

If the switch cannot pre-allocate power when a port is in static mode (for example, because the entire power budget is already allocated to other auto or static ports), this message appears: Command rejected: power inline static: pwr not available. The port configuration remains unchanged.

When you configure a port by using the **power inline auto** or the **power inline static** interface configuration command, the port autonegotiates by using the configured speed and duplex settings. This is necessary to determine the power requirements of the connected device (whether or not it is a powered device). After the power requirements have been determined, the switch hardcodes the interface by using the configured speed and duplex settings without resetting the interface.

When you configure a port by using the **power inline never** command, the port reverts to the configured speed and duplex settings.

If a port has a Cisco powered device connected to it, you should not use the **power inline never** command to configure the port. A false link-up can occur, placing the port in an error-disabled state.

Use the **power inline port priority {high | low}** command to configure the power priority of a PoE port. Powered devices connected to ports with low port priority are shut down first in case of a power shortage.

You can verify your settings by entering the **show power inline** EXEC command.

Examples

This example shows how to enable detection of a powered device and to automatically power a PoE port on a switch:

```
(config)# interface gigabitethernet1/0/2
(config-if)# power inline auto
```

This example shows how to configure a PoE port on a switch to allow a class 1 or a class 2 powered device:

```
(config)# interface gigabitethernet1/0/2
(config-if)# power inline auto max 7000
```

This example shows how to disable powered-device detection and to not power a PoE port on a switch:

```
(config)# interface gigabitethernet1/0/2
(config-if)# power inline never
```

This example shows how to set the priority of a port to high, so that it would be one of the last ports to be shut down in case of power supply failure:

```
(config)# interface gigabitethernet1/0/2
(config-if)# power inline port priority high
```

power inline police

To enable policing of real-time power consumption on a powered device, use the **power inline police** command in interface configuration mode. To disable this feature, use the **no** form of this command

```
power inline police [action errdisable | log]
no power inline police
```

Syntax Description	action errdisable	(Optional) Configures the to turn off power to the port if the real-time power consumption exceeds the maximum power allocation on the port. This is the default action.
	action log	(Optional) Configures the to generate a syslog message while still providing power to a connected device if the real-time power consumption exceeds the maximum power allocation on the port.
Command Default	Policing of the real-time power consumption of the powered device is disabled.	
Command Modes	Interface configuration	
Command History	Release	Modification
		This command was introduced.

Usage Guidelines

This command is supported only on the LAN Base image.

This command is supported only on Power over Ethernet (PoE)-capable ports. If you enter this command on a port that does not support PoE, an error message appears.

In a switch stack, this command is supported on all switches or ports in the stack that support PoE and real-time power-consumption monitoring.

When policing of the real-time power consumption is enabled, the takes action when a powered device consumes more power than the allocated maximum amount.

When PoE is enabled, the senses the real-time power consumption of the powered device. This feature is called *power monitoring* or *power sensing*. The also polices the power usage with the *power policing* feature.

When power policing is enabled, the uses one of the these values as the cutoff power on the PoE port in this order:

1. The user-defined power level that limits the power allowed on the port when you enter the **power inline auto max max-wattage** or the **power inline static max max-wattage** interface configuration command
2. The automatically sets the power usage of the device by using CDP power negotiation or by the IEEE classification and LLDP power negotiation.

If you do not manually configure the cutoff-power value, the automatically determines it by using CDP power negotiation or the device IEEE classification and LLDP power negotiation. If CDP or LLDP are not enabled, the default value of 30 W is applied. However without CDP or LLDP, the does not allow devices to consume more than 15.4 W of power because values from 15400 to 30000 mW are only allocated based on CDP or LLDP requests. If a powered device consumes more than 15.4 W without CDP or LLDP negotiation, the device might be in violation of the maximum current *I_{max}* limitation and might experience an *I_{cut}* fault for

drawing more current than the maximum. The port remains in the fault state for a time before attempting to power on again. If the port continuously draws more than 15.4 W, the cycle repeats.

When a powered device connected to a PoE+ port restarts and sends a CDP or LLDP packet with a power TLV, the locks to the power-negotiation protocol of that first packet and does not respond to power requests from the other protocol. For example, if the is locked to CDP, it does not provide power to devices that send LLDP requests. If CDP is disabled after the has locked on it, the does not respond to LLDP power requests and can no longer power on any accessories. In this case, you should restart the powered device.

If power policing is enabled, the polices power usage by comparing the real-time power consumption to the maximum power allocated on the PoE port. If the device uses more than the maximum power allocation (or *cutoff power*) on the port, the either turns power off to the port, or the generates a syslog message and updates the LEDs (the port LEDs are blinking amber) while still providing power to the device.

- To configure the to turn off power to the port and put the port in the error-disabled state, use the **power inline police** interface configuration command.
- To configure the to generate a syslog message while still providing power to the device, use the **power inline police action log** command.

If you do not enter the **action log** keywords, the default action is to shut down the port, turn off power to it, and put the port in the PoE error-disabled state. To configure the PoE port to automatically recover from the error-disabled state, use the **errdisable detect cause inline-power** global configuration command to enable error-disabled detection for the PoE cause and the **errdisable recovery cause inline-power interval interval** global configuration command to enable the recovery timer for the PoE error-disabled cause.



Caution

If policing is disabled, no action occurs when the powered device consumes more than the maximum power allocation on the port, which could adversely affect the .

You can verify your settings by entering the **show power inline police** privileged EXEC command.

Examples

This example shows how to enable policing of the power consumption and configuring the to generate a syslog message on the PoE port on a :

```
(config)# interface gigabitethernet1/0/2
(config-if)# power inline police action log
```

power supply

To configure and manage the internal power supplies on a switch, use the **power supply** command in privileged EXEC mode.

power supply *stack-member-number* **slot A | B** **off | on**

Syntax Description		
<i>stack-member-number</i>		Stack member number for which to configure the internal power supplies. The range is 1 to 9, depending on the number of switches in the stack. This parameter is available only on stacking-capable switches.
slot		Selects the switch power supply to set.
A		Selects the power supply in slot A.
B		Selects the power supply in slot B. Note Power supply slot B is the closest slot to the outer edge of the switch.
off		Sets the switch power supply to off.
on		Sets the switch power supply to on.

Command Default The switch power supply is on.

Command Modes Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Usage Guidelines The **power supply** command applies to a switch or to a switch stack where all switches are the same platform. In a switch stack with the same platform switches, you must specify the stack member before entering the **slot {A | B} off** or **on** keywords.

To return to the default setting, use the **power supply stack-member-number on** command.

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

Examples

This example shows how to set the power supply in slot A to off:

```
> power supply 2 slot A off
Disabling Power supply A may result in a power loss to PoE devices and/or switches ...
Continue? (yes/[no]): yes

Jun 10 04:52:54.389: %PLATFORM_ENV-6-FRU_PS_OIR: FRU Power Supply 1 powered off
Jun 10 04:52:56.717: %PLATFORM_ENV-1-FAN_NOT_PRESENT: Fan is not present
```

This example shows how to set the power supply in slot A to on:

```
> power supply 1 slot B on
Jun 10 04:54:39.600: %PLATFORM_ENV-6-FRU_PS_OIR: FRU Power Supply 1 powered on
```

This example shows the output of the show env power command:

```
> show env power
SW  PID                               Serial#      Status      Sys Pwr  PoE Pwr  Watts
--  -
1A  PWR-1RUC2-640WAC                   DCB1705B05B OK          Good     Good     250/390
1B  Not Present
```

show CAPWAP summary

To display all the CAPWAP tunnels established by the controller to access points and other mobility controllers use the **show CAPWAP summary** command.

show CAPWAP summary

Syntax Description	This command has no arguments or keywords.				
Command Default	None				
Command Modes	Global configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

This example shows how to display CAPWAP tunnels established by the controllers to the access points and other controllers.

```
# show capwap summary
CAPWAP Tunnels General Statistics:
Number of Capwap Data Tunnels = 8
Number of Capwap Mobility Tunnels = 0
Number of Capwap Multicast Tunnels = 0
Name APName Type PhyPortIf Mode McastIf
-----
Ca4 AP-Behind-Router data - unicast -
Ca0 AP1142-kat data - unicast -
Ca5 APRFCHAMBER2-EDISON data - unicast -
Ca6 KATANA_2_RF data - unicast -
Ca1 AP-1040-RF data - unicast -
Ca7 KATANA_1_RF data - unicast -
Ca2 AP3500-2027 data - unicast -
Ca3 AP-1040-out data - unicast -
```

show controllers cpu-interface

To display the state of the CPU network interface ASIC and the send and receive statistics for packets reaching the CPU, use the **show controllers cpu-interface** command in privileged EXEC mode.

show controllers cpu-interface

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

This display provides information that might be useful for Cisco technical support representatives troubleshooting the switch.

Examples

This is a partial output example from the **show controllers cpu-interface** command:

show controllers ethernet-controller

To display per-interface send and receive statistics read from the hardware with keywords, use the **show controllers ethernet-controller** command in EXEC mode.

Command Modes User EXEC (only supported with the *interface-id* keywords in user EXEC mode)
Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Usage Guidelines Without keywords, this command provides the RMON statistics for all interfaces or for the specified interface. To display the interface internal registers, use the **phy** keyword. To display information about the port ASIC, use the **port-asic** keyword.

When you enter the **phy** or **port-asic** keywords, the displayed information is useful primarily for Cisco technical support representatives troubleshooting the switch.

Examples

This is an example of output from the **show controllers ethernet-controller** command for an interface:

```
# show controllers ethernet-controller gigabitethernet6/0/1
Transmit GigabitEthernet6/0/1          Receive
 0 Bytes                                0 Bytes
 0 Unicast frames                       0 Unicast frames
 0 Multicast frames                     0 Multicast frames
 0 Broadcast frames                     0 Broadcast frames
 0 Too old frames                        0 Unicast bytes
 0 Deferred frames                      0 Multicast bytes
 0 MTU exceeded frames                  0 Broadcast bytes
 0 1 collision frames                   0 Alignment errors
 0 2 collision frames                   0 FCS errors
 0 3 collision frames                   0 Oversize frames
 0 4 collision frames                   0 Undersize frames
 0 5 collision frames                   0 Collision fragments
 0 6 collision frames
 0 7 collision frames                   0 Minimum size frames
 0 8 collision frames                   0 65 to 127 byte frames
 0 9 collision frames                   0 128 to 255 byte frames
 0 10 collision frames                   0 256 to 511 byte frames
 0 11 collision frames                   0 512 to 1023 byte frames
 0 12 collision frames                   0 1024 to 1518 byte frames
 0 13 collision frames                   0 Overrun frames
 0 14 collision frames                   0 Pause frames
 0 15 collision frames                   0 Symbol error frames
 0 Excessive collisions
 0 Late collisions                       0 Invalid frames, too large
 0 VLAN discard frames                   0 Valid frames, too large
 0 Excess defer frames                   0 Invalid frames, too small
 0 64 byte frames                        0 Valid frames, too small
 0 127 byte frames
 0 255 byte frames                       0 Too old frames
 0 511 byte frames                       0 Valid oversize frames
 0 1023 byte frames                       0 System FCS error frames
```

```

0 1518 byte frames          0 RxPortFifoFull drop frame
0 Too large frames
0 Good (1 coll) frames

```

Table 1: Transmit Field Descriptions

Field	Description
Bytes	The total number of bytes sent on an interface.
Unicast Frames	The total number of frames sent to unicast addresses.
Multicast frames	The total number of frames sent to multicast addresses.
Broadcast frames	The total number of frames sent to broadcast addresses.
Too old frames	The number of frames dropped on the egress port because the packet aged out.
Deferred frames	The number of frames that are not sent after the time exceeds 2*maximum-packet time.
MTU exceeded frames	The number of frames that are larger than the maximum allowed frame size.
1 collision frames	The number of frames that are successfully sent on an interface after one collision occurs.
2 collision frames	The number of frames that are successfully sent on an interface after two collisions occur.
3 collision frames	The number of frames that are successfully sent on an interface after three collisions occur.
4 collision frames	The number of frames that are successfully sent on an interface after four collisions occur.
5 collision frames	The number of frames that are successfully sent on an interface after five collisions occur.
6 collision frames	The number of frames that are successfully sent on an interface after six collisions occur.
7 collision frames	The number of frames that are successfully sent on an interface after seven collisions occur.
8 collision frames	The number of frames that are successfully sent on an interface after eight collisions occur.
9 collision frames	The number of frames that are successfully sent on an interface after nine collisions occur.
10 collision frames	The number of frames that are successfully sent on an interface after ten collisions occur.

Field	Description
11 collision frames	The number of frames that are successfully sent on an interface after 11 collisions occur.
12 collision frames	The number of frames that are successfully sent on an interface after 12 collisions occur.
13 collision frames	The number of frames that are successfully sent on an interface after 13 collisions occur.
14 collision frames	The number of frames that are successfully sent on an interface after 14 collisions occur.
15 collision frames	The number of frames that are successfully sent on an interface after 15 collisions occur.
Excessive collisions	The number of frames that could not be sent on an interface after 16 collisions occur.
Late collisions	After a frame is sent, the number of frames dropped because late collisions were detected while the frame was sent.
VLAN discard frames	The number of frames dropped on an interface because the CFI ¹ bit is set.
Excess defer frames	The number of frames that are not sent after the time exceeds the maximum-packet time.
64 byte frames	The total number of frames sent on an interface that are 64 bytes.
127 byte frames	The total number of frames sent on an interface that are from 65 to 127 bytes.
255 byte frames	The total number of frames sent on an interface that are from 128 to 255 bytes.
511 byte frames	The total number of frames sent on an interface that are from 256 to 511 bytes.
1023 byte frames	The total number of frames sent on an interface that are from 512 to 1023 bytes.
1518 byte frames	The total number of frames sent on an interface that are from 1024 to 1518 bytes.
Too large frames	The number of frames sent on an interface that are larger than the maximum allowed frame size.
Good (1 coll) frames	The number of frames that are successfully sent on an interface after one collision occurs. This value does not include the number of frames that are not successfully sent after one collision occurs.

¹ CFI = Canonical Format Indicator

Table 2: Receive Field Descriptions

Field	Description
Bytes	The total amount of memory (in bytes) used by frames received on an interface, including the FCS ² value and the incorrectly formed frames. This value excludes the frame header bits.

Field	Description
Unicast frames	The total number of frames successfully received on the interface that are directed to unicast addresses.
Multicast frames	The total number of frames successfully received on the interface that are directed to multicast addresses.
Broadcast frames	The total number of frames successfully received on an interface that are directed to broadcast addresses.
Unicast bytes	The total amount of memory (in bytes) used by unicast frames received on an interface, including the FCS value and the incorrectly formed frames. This value excludes the frame header bits.
Multicast bytes	The total amount of memory (in bytes) used by multicast frames received on an interface, including the FCS value and the incorrectly formed frames. This value excludes the frame header bits.
Broadcast bytes	The total amount of memory (in bytes) used by broadcast frames received on an interface, including the FCS value and the incorrectly formed frames. This value excludes the frame header bits.
Alignment errors	The total number of frames received on an interface that have alignment errors.
FCS errors	The total number of frames received on an interface that have a valid length (in bytes) but do not have the correct FCS values.
Oversize frames	The number of frames received on an interface that are larger than the maximum allowed frame size.
Undersize frames	The number of frames received on an interface that are smaller than 64 bytes.
Collision fragments	The number of collision fragments received on an interface.
Minimum size frames	The total number of frames that are the minimum frame size.
65 to 127 byte frames	The total number of frames that are from 65 to 127 bytes.
128 to 255 byte frames	The total number of frames that are from 128 to 255 bytes.
256 to 511 byte frames	The total number of frames that are from 256 to 511 bytes.
512 to 1023 byte frames	The total number of frames that are from 512 to 1023 bytes.
1024 to 1518 byte frames	The total number of frames that are from 1024 to 1518 bytes.
Overrun frames	The total number of overrun frames received on an interface.
Pause frames	The number of pause frames received on an interface.
Symbol error frames	The number of frames received on an interface that have symbol errors.

Field	Description
Invalid frames, too large	The number of frames received that were larger than maximum allowed MTU ³ size (including the FCS bits and excluding the frame header) and that have either an FCS error or an alignment error.
Valid frames, too large	The number of frames received on an interface that are larger than the maximum allowed frame size.
Invalid frames, too small	The number of frames received that are smaller than 64 bytes (including the FCS bits and excluding the frame header) and that have either an FCS error or an alignment error.
Valid frames, too small	The number of frames received on an interface that are smaller than 64 bytes (or 68 bytes for VLAN-tagged frames) and that have valid FCS values. The frame size includes the FCS bits but excludes the frame header bits.
Too old frames	The number of frames dropped on the ingress port because the packet aged out.
Valid oversize frames	The number of frames received on an interface that are larger than the maximum allowed frame size and have valid FCS values. The frame size includes the FCS value but does not include the VLAN tag.
System FCS error frames	The total number of frames received on an interface that have a valid length (in bytes) but that do not have the correct FCS values.
RxPortFifoFull drop frames	The total number of frames received on an interface that are dropped because the ingress queue is full.

² FCS = frame check sequence

³ MTU = maximum transmission unit

This is an example of output from the **show controllers ethernet-controller phy** command for a specific interface:

```
# show controllers ethernet-controller gigabitethernet1/0/2 phy
Control Register                : 0001 0001 0100 0000
Control STATUS                  : 0111 1001 0100 1001
Phy ID 1                        : 0000 0001 0100 0001
Phy ID 2                        : 0000 1100 0010 0100
Auto-Negotiation Advertisement : 0000 0011 1110 0001
Auto-Negotiation Link Partner  : 0000 0000 0000 0000
Auto-Negotiation Expansion Reg  : 0000 0000 0000 0100
Next Page Transmit Register     : 0010 0000 0000 0001
Link Partner Next page Register : 0000 0000 0000 0000
1000BASE-T Control Register     : 0000 1111 0000 0000
1000BASE-T Status Register      : 0100 0000 0000 0000
Extended Status Register        : 0011 0000 0000 0000
PHY Specific Control Register    : 0000 0000 0111 1000
PHY Specific Status Register     : 1000 0001 0100 0000
Interrupt Enable                 : 0000 0000 0000 0000
Interrupt Status                 : 0000 0000 0100 0000
Extended PHY Specific Control    : 0000 1100 0110 1000
Receive Error Counter           : 0000 0000 0000 0000
Reserved Register 1             : 0000 0000 0000 0000
Global Status                   : 0000 0000 0000 0000
LED Control                     : 0100 0001 0000 0000
Manual LED Override             : 0000 1000 0010 1010
```

show controllers ethernet-controller

```

Extended PHY Specific Control      : 0000 0000 0001 1010
Disable Receiver 1                 : 0000 0000 0000 1011
Disable Receiver 2                 : 1000 0000 0000 0100
Extended PHY Specific Status       : 1000 0100 1000 0000
Auto-MDIX                          : On   [AdminState=1  Flags=0x00052248]

```

This is an example of output from the **show controllers ethernet-controller tengigabitethernet1/0/1 phy** command:

```

# show controllers ethernet-controller tengigabitethernet1/0/1 phy
TenGigabitEthernet1/0/1 (gpn: 29, port-number: 1)
-----
X2 Serial EEPROM Contents:
Non-Volatile Register (NVR) Fields
X2 MSA Version supported :0x1E
NVR Size in bytes :0x100
Number of bytes used :0x100
Basic Field Address :0xB
Customer Field Address :0x77
Vendor Field Address :0xA7
Extended Vendor Field Address :0x100
Reserved :0x0
Transceiver type :0x2 =X2
Optical connector type :0x1 =SC
Bit encoding:0x1 =NRZ
Normal BitRate in multiple of 1M b/s :0x2848
Protocol Type:0x1 =10GgE
Standards Compliance Codes :
10GbE Code Byte 0 :0x4 =10GBASE-ER
10GbE Code Byte 1 :0x0
SONET/SDH Code Byte 0:0x0
SONET/SDH Code Byte 1:0x0
SONET/SDH Code Byte 2:0x0
SONET/SDH Code Byte 3:0x0
10GFC Code Byte 0 :0x0
10GFC Code Byte 1 :0x0
10GFC Code Byte 2 :0x0
10GFC Code Byte 3 :0x0
Transmission range in10m :0xFA0
Fibre Type :
Fibre Type Byte 0 :0x20 =SM, Generic
Fibre Type Byte 1 :0x0 =Unspecified

<output truncated>

```

This is an example of output from the **show controllers ethernet-controller port-asic configuration** command:

```

# show controllers ethernet-controller port-asic configuration
=====
Switch 1, PortASIC 0 Registers
-----
DeviceType           : 000101BC
Reset                : 00000000
PmadMicConfig        : 00000001
PmadMicDiag          : 00000003
SupervisorReceiveFifoSramInfo : 000007D0 000007D0 40000000
SupervisorTransmitFifoSramInfo : 000001D0 000001D0 40000000
GlobalStatus         : 00000800
IndicationStatus     : 00000000
IndicationStatusMask : FFFFFFFF

```

```

InterruptStatus          : 00000000
InterruptStatusMask     : 01FFE800
SupervisorDiag          : 00000000
SupervisorFrameSizeLimit : 000007C8
SupervisorBroadcast     : 000A0F01
GeneralIO                : 000003F9 00000000 00000004
StackPcsInfo            : FFFF1000 860329BD 5555FFFF FFFFFFFF
                        FF0FFF00 86020000 5555FFFF 00000000
StackRacInfo            : 73001630 00000003 7F001644 00000003
                        24140003 FD632B00 18E418E0 FFFFFFFF
StackControlStatus      : 18E418E0
stackControlStatusMask  : FFFFFFFF
TransmitBufferFreeListInfo : 00000854 00000800 00000FF8 00000000
                        0000088A 0000085D 00000FF8 00000000
TransmitRingFifoInfo    : 00000016 00000016 40000000 00000000
                        0000000C 0000000C 40000000 00000000
TransmitBufferInfo      : 00012000 00000FFF 00000000 00000030
TransmitBufferCommonCount : 00000F7A
TransmitBufferCommonCountPeak : 0000001E
TransmitBufferCommonCommonEmpty : 000000FF
NetworkActivity         : 00000000 00000000 00000000 02400000
DroppedStatistics      : 00000000
FrameLengthDeltaSelect : 00000001
SneakPortFifoInfo      : 00000000
MacInfo                 : 0EC0801C 00000001 0EC0801B 00000001
                        00C0001D 00000001 00C0001E 00000001
<output truncated>

```

This is an example of output from the **show controllers ethernet-controller port-asic statistics** command:

```

# show controllers ethernet-controller port-asic statistics
=====
Switch 1, PortASIC 0 Statistics
-----
      0 RxQ-0, wt-0 enqueue frames          0 RxQ-0, wt-0 drop frames
4118966 RxQ-0, wt-1 enqueue frames         0 RxQ-0, wt-1 drop frames
      0 RxQ-0, wt-2 enqueue frames         0 RxQ-0, wt-2 drop frames

      0 RxQ-1, wt-0 enqueue frames          0 RxQ-1, wt-0 drop frames
296 RxQ-1, wt-1 enqueue frames            0 RxQ-1, wt-1 drop frames
2836036 RxQ-1, wt-2 enqueue frames        0 RxQ-1, wt-2 drop frames

      0 RxQ-2, wt-0 enqueue frames          0 RxQ-2, wt-0 drop frames
      0 RxQ-2, wt-1 enqueue frames         0 RxQ-2, wt-1 drop frames
158377 RxQ-2, wt-2 enqueue frames         0 RxQ-2, wt-2 drop frames

      0 RxQ-3, wt-0 enqueue frames          0 RxQ-3, wt-0 drop frames
      0 RxQ-3, wt-1 enqueue frames         0 RxQ-3, wt-1 drop frames
      0 RxQ-3, wt-2 enqueue frames         0 RxQ-3, wt-2 drop frames

15 TxBufferFull Drop Count                0 Rx Fcs Error Frames
      0 TxBufferFrameDesc BadCrc16         0 Rx Invalid Oversize Frames
      0 TxBuffer Bandwidth Drop Cou       0 Rx Invalid Too Large Frames
      0 TxQueue Bandwidth Drop Coun       0 Rx Invalid Too Large Frames
      0 TxQueue Missed Drop Statist       0 Rx Invalid Too Small Frames
74 RxBuffer Drop DestIndex Cou           0 Rx Too Old Frames
      0 SneakQueue Drop Count             0 Tx Too Old Frames
      0 Learning Queue Overflow Fra       0 System Fcs Error Frames
      0 Learning Cam Skip Count

15 Sup Queue 0 Drop Frames                0 Sup Queue 8 Drop Frames

```

```
show controllers ethernet-controller
```

```
0 Sup Queue 1 Drop Frames          0 Sup Queue 9 Drop Frames
0 Sup Queue 2 Drop Frames          0 Sup Queue 10 Drop Frames
0 Sup Queue 3 Drop Frames          0 Sup Queue 11 Drop Frames
0 Sup Queue 4 Drop Frames          0 Sup Queue 12 Drop Frames
0 Sup Queue 5 Drop Frames          0 Sup Queue 13 Drop Frames
0 Sup Queue 6 Drop Frames          0 Sup Queue 14 Drop Frames
0 Sup Queue 7 Drop Frames          0 Sup Queue 15 Drop Frames
=====
Switch 1, PortASIC 1 Statistics
-----
0 RxQ-0, wt-0 enqueue frames      0 RxQ-0, wt-0 drop frames
52 RxQ-0, wt-1 enqueue frames     0 RxQ-0, wt-1 drop frames
0 RxQ-0, wt-2 enqueue frames      0 RxQ-0, wt-2 drop frames
```

```
<output truncated>
```

show controllers utilization

To display bandwidth utilization, use the **show controllers utilization** command in EXEC mode.

show controllers [*interface-id*] **utilization**

Syntax Description	<i>interface-id</i> (Optional) ID of the physical interface.
---------------------------	--

Command Default	None
------------------------	------

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

Command History	Release	Modification
		This command was introduced.

This is an example of output from the **show controllers utilization** command:

```
> show controllers utilization
Port          Receive Utilization  Transmit Utilization
Gi1/0/1       0                    0
Gi1/0/2       0                    0
Gi1/0/3       0                    0
Gi1/0/4       0                    0
Gi1/0/5       0                    0
Gi1/0/6       0                    0
Gi1/0/7       0                    0
<output truncated>
Gi2/0/1       0                    0
Gi2/0/2       0                    0
<output truncated>
Switch Receive Bandwidth Percentage Utilization : 0
Switch Transmit Bandwidth Percentage Utilization : 0
Switch Fabric Percentage Utilization : 0
```

This is an example of output from the **show controllers utilization** command on a specific port:

```
> show controllers gigabitethernet1/0/1 utilization
Receive Bandwidth Percentage Utilization : 0
Transmit Bandwidth Percentage Utilization : 0
```

Table 3: Show controllers utilization Field Descriptions

Field	Description
Receive Bandwidth Percentage Utilization	Displays the received bandwidth usage of the switch, which is the sum of the received traffic on all the ports divided by the switch receive capacity.

Field	Description
Transmit Bandwidth Percentage Utilization	Displays the transmitted bandwidth usage of the switch, which is the sum of the transmitted traffic on all the ports divided it by the switch transmit capacity.
Fabric Percentage Utilization	Displays the average of the transmitted and received bandwidth usage of the switch.

show env

To display fan, temperature, and power information, use the **show env** command in EXEC mode.

```
show env all | fan | power [all | switch [stack-member-number]] | stack [stack-member-number] |
temperature [status]
```

Syntax Description	
all	Displays the fan and temperature environmental status and the status of the internal power supplies.
fan	Displays the switch fan status.
power	Displays the internal power status of the active switch.
all	(Optional) Displays the status of all the internal power supplies in a standalone switch when the command is entered on the switch, or in all the member switches when the command is entered on the active switch.
switch	(Optional) Displays the status of the internal power supplies for each switch in the stack or for the specified switch. This keyword is available only on stacking-capable switches.
<i>stack-member-number</i>	(Optional) Number of the member switch for which to display the status of the internal power supplies or the environmental status.
stack	Displays all environmental status for each switch in the stack or for the specified switch. This keyword is available only on stacking-capable switches.
temperature	Displays the switch temperature status.
status	(Optional) Displays the switch internal temperature (not the external temperature) and the threshold values.

Command Default None

Command Modes User EXEC

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

Use the **show env** EXEC command to display the information for the switch being accessed—a standalone switch or the active switch. Use this command with the **stack** and **switch** keywords to display all information for the stack or for the specified member switch.

If you enter the **show env temperature status** command, the command output shows the switch temperature state and the threshold level.

You can also use the **show env temperature** command to display the switch temperature status. The command output shows the green and yellow states as *OK* and the red state as *FAULTY*. If you enter the **show env all** command, the command output is the same as the **show env temperature status** command output.

Examples

This is an example of output from the **show env power all** command on the active switch:

Table 4: States in the show env temperature status Command Output

State	Description
Green	The switch temperature is in the <i>normal</i> operating range.
Yellow	The temperature is in the <i>warning</i> range. You should check the external temperature around the switch.
Red	The temperature is in the <i>critical</i> range. The switch might not run properly if the temperature is in this range.

show errdisable detect

To display error-disabled detection status, use the **show errdisable detect** command in EXEC mode.

show errdisable detect

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Usage Guidelines A gbic-invalid error reason refers to an invalid small form-factor pluggable (SFP) module. The error-disable reasons in the command output are listed in alphabetical order. The mode column shows how error-disable is configured for each feature.

You can configure error-disabled detection in these modes:

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

show errdisable recovery

To display the error-disabled recovery timer information, use the **show errdisable recovery** command in EXEC mode.

show errdisable recovery

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
		This command was introduced.

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



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

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

show interfaces counters

To display various counters for the switch or for a specific interface, use the **show interfaces counters** command in privileged EXEC mode.

show interfaces [*interface-id*] **counters** [**errors** | **etherchannel** | **module** *stack-member-number* | **protocol status** | **trunk**]

Syntax Description

<i>interface-id</i>	(Optional) ID of the physical interface, including type, stack member (stacking-capable switches only) module, and port number.
errors	(Optional) Displays error counters.
etherchannel	(Optional) Displays EtherChannel counters, including octets, broadcast packets, multicast packets, and unicast packets received and sent.
module <i>stack-member-number</i>	(Optional) Displays counters for the specified stack member. Note In this command, the module keyword refers to the stack member number. The module number that is part of the interface ID is always zero.
protocol status	(Optional) Displays the status of protocols enabled on interfaces.
trunk	(Optional) Displays trunk counters.



Note Though visible in the command-line help string, the **vlan** *vlan-id* keyword is not supported.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

If you do not enter any keywords, all counters for all interfaces are included.

This is an example of partial output from the **show interfaces counters** command. It displays all counters for the switch.

```
# show interfaces counters
Port          InOctets      InUcastPkts    InMcastPkts    InBcastPkts
Gi1/0/1             0              0              0              0
Gi1/0/2             0              0              0              0
Gi1/0/3          95285341      43115          1178430        1950
Gi1/0/4             0              0              0              0
```

<output truncated>

This is an example of partial output from the **show interfaces counters module** command for stack member 2. It displays all counters for the specified switch in the stack.

```
# show interfaces counters module 2
Port          InOctets    InUcastPkts  InMcastPkts  InBcastPkts
Gi1/0/1       520         2            0            0
Gi1/0/2       520         2            0            0
Gi1/0/3       520         2            0            0
Gi1/0/4       520         2            0            0
```

<output truncated>

This is an example of partial output from the **show interfaces counters protocol status** command for all interfaces:

```
# show interfaces counters protocol status
Protocols allocated:
Vlan1: Other, IP
Vlan20: Other, IP, ARP
Vlan30: Other, IP, ARP
Vlan40: Other, IP, ARP
Vlan50: Other, IP, ARP
Vlan60: Other, IP, ARP
Vlan70: Other, IP, ARP
Vlan80: Other, IP, ARP
Vlan90: Other, IP, ARP
Vlan900: Other, IP, ARP
Vlan3000: Other, IP
Vlan3500: Other, IP
GigabitEthernet1/0/1: Other, IP, ARP, CDP
GigabitEthernet1/0/2: Other, IP
GigabitEthernet1/0/3: Other, IP
GigabitEthernet1/0/4: Other, IP
GigabitEthernet1/0/5: Other, IP
GigabitEthernet1/0/6: Other, IP
GigabitEthernet1/0/7: Other, IP
GigabitEthernet1/0/8: Other, IP
GigabitEthernet1/0/9: Other, IP
GigabitEthernet1/0/10: Other, IP, CDP
```

<output truncated>

This is an example of output from the **show interfaces counters trunk** command. It displays trunk counters for all interfaces.

```
# show interfaces counters trunk
Port          TrunkFramesTx  TrunkFramesRx  WrongEncap
Gi1/0/1       0              0              0
Gi1/0/2       0              0              0
Gi1/0/3       80678         0              0
Gi1/0/4       82320         0              0
Gi1/0/5       0              0              0
```

<output truncated>

show interfaces switchport

To display the administrative and operational status of a switching (nonrouting) port, including port blocking and port protection settings, use the **show interfaces switchport** command in privileged EXEC mode.

show interfaces [*interface-id*] **switchport** [**backup** [**detail**] | **module** *number*]

Syntax Description	
<i>interface-id</i>	(Optional) ID of the interface. Valid interfaces include physical ports (including type, stack member for stacking-capable switches, module, and port number) and port channels. The port channel range is 1 to 48.
backup	(Optional) Displays Flex Link backup interface configuration for the specified interface or all interfaces.
detail	(Optional) Displays detailed backup information for the specified interface or all interfaces on the switch or the stack.
module <i>number</i>	(Optional) Displays switchport configuration of all interfaces on the switch or specified stack member. This option is not available if you entered a specific interface ID.

Command Default None

Command Modes Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Usage Guidelines Use the **show interface switchport module** *number* command to display the switch port characteristics of all interfaces on that switch in the stack. If there is no switch with that module number in the stack, there is no output.

This is an example of output from the **show interfaces switchport** command for a port. The table that follows describes the fields in the display.



Note Private VLANs are not supported in this release, so those fields are not applicable.

```
# show interfaces gigabitethernet1/0/1 switchport
Name: Gi1/0/1
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: down
Administrative Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 10 (VLAN0010)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
```

show interfaces switchport

```

Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk Native VLAN tagging: enabled
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk associations: none
Administrative private-vlan trunk mappings: none
Operational private-vlan: none
Trunking VLANs Enabled: 11-20
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL

Protected: false
Unknown unicast blocked: disabled
Unknown multicast blocked: disabled
Appliance trust: none

```

Field	Description
Name	Displays the port name.
Switchport	Displays the administrative and operational status of the port. In this display, the port is in switchport mode.
Administrative Mode Operational Mode	Displays the administrative and operational modes.
Administrative Trunking Encapsulation Operational Trunking Encapsulation Negotiation of Trunking	Displays the administrative and operational encapsulation method and whether trunking negotiation is enabled.
Access Mode VLAN	Displays the VLAN ID to which the port is configured.
Trunking Native Mode VLAN Trunking VLANs Enabled Trunking VLANs Active	Lists the VLAN ID of the trunk that is in native mode. Lists the allowed VLANs on the trunk. Lists the active VLANs on the trunk.
Pruning VLANs Enabled	Lists the VLANs that are pruning-eligible.
Protected	Displays whether or not protected port is enabled (True) or disabled (False) on the interface.
Unknown unicast blocked Unknown multicast blocked	Displays whether or not unknown multicast and unknown unicast traffic is blocked on the interface.
Voice VLAN	Displays the VLAN ID on which voice VLAN is enabled.
Appliance trust	Displays the class of service (CoS) setting of the data packets of the IP phone.

This is an example of output from the **show interfaces switchport backup** command:

```
# show interfaces switchport backup
Switch Backup Interface Pairs:
Active Interface      Backup Interface      State
-----
Gi1/0/1              Gi1/0/2              Active Up/Backup Standby
Gi3/0/3              Gi4/0/5              Active Down/Backup Up
Po1                  Po2                  Active Standby/Backup Up
```

In this example of output from the **show interfaces switchport backup** command, VLANs 1 to 50, 60, and 100 to 120 are configured on the switch:

```
(config)# interface gigabitethernet 2/0/6
(config-if)# switchport backup interface gigabitethernet 2/0/8
prefer vlan 60,100-120
```

When both interfaces are up, Gi2/0/8 forwards traffic for VLANs 60, 100 to 120, and Gi2/0/6 will forward traffic for VLANs 1 to 50.

```
# show interfaces switchport backup

Switch Backup Interface Pairs:
Active Interface      Backup Interface      State
-----
GigabitEthernet2/0/6  GigabitEthernet2/0/8  Active Up/Backup Up
Vlans on Interface Gi 2/0/6: 1-50
Vlans on Interface Gi 2/0/8: 60, 100-120
```

When a Flex Link interface goes down (LINK_DOWN), VLANs preferred on this interface are moved to the peer interface of the Flex Link pair. In this example, if interface Gi2/0/6 goes down, Gi2/0/8 carries all VLANs of the Flex Link pair.

```
# show interfaces switchport backup

Switch Backup Interface Pairs:
Active Interface      Backup Interface      State
-----
GigabitEthernet2/0/6  GigabitEthernet2/0/8  Active Down/Backup Up
Vlans on Interface Gi 2/0/6:
Vlans on Interface Gi 2/0/8: 1-50, 60, 100-120
```

When a Flex Link interface comes up, VLANs preferred on this interface are blocked on the peer interface and moved to the forwarding state on the interface that has just come up. In this example, if interface Gi2/0/6 comes up, then VLANs preferred on this interface are blocked on the peer interface Gi2/0/8 and forwarded on Gi2/0/6.

```
# show interfaces switchport backup

Switch Backup Interface Pairs:
Active Interface      Backup Interface      State
-----
GigabitEthernet2/0/6  GigabitEthernet2/0/8  Active Up/Backup Up
Vlans on Interface Gi 2/0/6: 1-50
Vlans on Interface Gi 2/0/8: 60, 100-120
```

show interfaces transceiver

To display the physical properties of a small form-factor pluggable (SFP) module interface, use the **show interfaces transceiver** command in EXEC mode.

show interfaces [*interface-id*] **transceiver** [**detail** | **module number** | **properties** | **supported-list** | **threshold-table**]

Syntax Description	
<i>interface-id</i>	(Optional) ID of the physical interface, including type, stack member (stacking-capable switches only) module, and port number.
detail	(Optional) Displays calibration properties, including high and low numbers and any alarm information for any Digital Optical Monitoring (DoM)-capable transceiver if one is installed in the switch.
module number	(Optional) Limits display to interfaces on module on the switch. This option is not available if you entered a specific interface ID.
properties	(Optional) Displays speed, duplex, and inline power settings on an interface.
supported-list	(Optional) Lists all supported transceivers.
threshold-table	(Optional) Displays alarm and warning threshold table.

Command Modes	
	User EXEC
	Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Examples

This is an example of output from the **show interfaces *interface-id* transceiver detail** command:

```
# show interfaces gigabitethernet1/1/1 transceiver detail
ITU Channel not available (Wavelength not available),
Transceiver is internally calibrated.
mA:milliamperes, dBm:decibels (milliwatts), N/A:not applicable.
++:high alarm, +:high warning, -:low warning, -- :low alarm.
A2D readouts (if they differ), are reported in parentheses.
The threshold values are uncalibrated.
```

Port	Temperature (Celsius)	High Alarm Threshold (Celsius)	High Warn Threshold (Celsius)	Low Warn Threshold (Celsius)	Low Alarm Threshold (Celsius)
Gi1/1/1	29.9	74.0	70.0	0.0	-4.0

Port	Voltage (Volts)	High Alarm Threshold (Volts)	High Warn Threshold (Volts)	Low Warn Threshold (Volts)	Low Alarm Threshold (Volts)
Gi1/1/1	3.28	3.60	3.50	3.10	3.00

Port	Optical Transmit Power (dBm)	High Alarm Threshold (dBm)	High Warn Threshold (dBm)	Low Warn Threshold (dBm)	Low Alarm Threshold (dBm)
Gi1/1/1	1.8	7.9	3.9	0.0	-4.0

Port	Optical Receive Power (dBm)	High Alarm Threshold (dBm)	High Warn Threshold (dBm)	Low Warn Threshold (dBm)	Low Alarm Threshold (dBm)
Gi1/1/1	-23.5	-5.0	-9.0	-28.2	-32.2

This is an example of output from the **show interfaces transceiver threshold-table** command:

```
# show interfaces transceiver threshold-table
      Optical Tx      Optical Rx      Temp      Laser Bias      Voltage
                current
-----
DWDM GBIC
Min1          -4.00          -32.00          -4          N/A          4.65
Min2           0.00          -28.00           0          N/A          4.75
Max2           4.00           -9.00           70          N/A          5.25
Max1           7.00           -5.00           74          N/A          5.40
DWDM SFP
Min1          -4.00          -32.00          -4          N/A          3.00
Min2           0.00          -28.00           0          N/A          3.10
Max2           4.00           -9.00           70          N/A          3.50
Max1           8.00           -5.00           74          N/A          3.60
RX only WDM GBIC
Min1          N/A           -32.00          -4          N/A          4.65
Min2          N/A           -28.30           0          N/A          4.75
Max2          N/A           -9.00           70          N/A          5.25
Max1          N/A           -5.00           74          N/A          5.40
DWDM XENPAK
Min1          -5.00          -28.00          -4          N/A          N/A
Min2          -1.00          -24.00           0          N/A          N/A
Max2           3.00           -7.00           70          N/A          N/A
Max1           7.00           -3.00           74          N/A          N/A
DWDM X2
Min1          -5.00          -28.00          -4          N/A          N/A
Min2          -1.00          -24.00           0          N/A          N/A
Max2           3.00           -7.00           70          N/A          N/A
Max1           7.00           -3.00           74          N/A          N/A
DWDM XFP
Min1          -5.00          -28.00          -4          N/A          N/A
Min2          -1.00          -24.00           0          N/A          N/A
Max2           3.00           -7.00           70          N/A          N/A
Max1           7.00           -3.00           74          N/A          N/A
CWDM X2
Min1          N/A           N/A             0          N/A          N/A
Min2          N/A           N/A             0          N/A          N/A
Max2          N/A           N/A             0          N/A          N/A
Max1          N/A           N/A             0          N/A          N/A
```

<output truncated>

show memory platform

To display memory statistics of a platform, use the **show memory platform** command in privileged EXEC mode.

show memory platform [**compressed-swap** | **information** | **page-merging**]

Syntax Description	
compressed-swap	(Optional) Displays platform memory compressed-swap information.
information	(Optional) Displays general information about the platform.
page-merging	(Optional) Displays platform memory page-merging information.

Command Modes Privileged EXEC (#)

Command History	Release	Modification
		This command was introduced.

Examples

The following is sample output from the **show memory platform** command:

```
Switch# show memory platform

Virtual memory   : 12874653696
Pages resident  : 627041
Major page faults: 2220
Minor page faults: 2348631

Architecture    : mips64
Memory (kB)
  Physical      : 3976852
  Total        : 3976852
  Used         : 2761276
  Free         : 1215576
  Active       : 2128196
  Inactive     : 1581856
  Inact-dirty  : 0
  Inact-clean  : 0
  Dirty        : 0
  AnonPages    : 1294984
  Bounce       : 0
  Cached       : 1978168
  Commit Limit : 1988424
  Committed As : 3343324
  High Total   : 0
  High Free    : 0
  Low Total    : 3976852
  Low Free     : 1215576
  Mapped       : 516316
  NFS Unstable : 0
  Page Tables  : 17124
  Slab         : 0
  VMmalloc Chunk : 1069542588
  VMmalloc Total : 1069547512
  VMmalloc Used : 2588
  Writeback    : 0
```

```

HugePages Total: 0
HugePages Free : 0
HugePages Rsvd : 0
HugePage Size  : 2048

Swap (kB)
  Total      : 0
  Used       : 0
  Free       : 0
  Cached     : 0

Buffers (kB) : 437136

Load Average
  1-Min      : 1.04
  5-Min      : 1.16
  15-Min     : 0.94

```

The following is sample output from the **show memory platform information** command:

Device# **show memory platform information**

```

Virtual memory : 12870438912
Pages resident : 626833
Major page faults: 2222
Minor page faults: 2362455

Architecture : mips64
Memory (kB)
  Physical : 3976852
  Total    : 3976852
  Used     : 2761224
  Free     : 1215628
  Active   : 2128060
  Inactive : 1584444
  Inact-dirty : 0
  Inact-clean : 0
  Dirty    : 284
  AnonPages : 1294656
  Bounce    : 0
  Cached    : 1979644
  Commit Limit : 1988424
  Committed As : 3342184
  High Total : 0
  High Free  : 0
  Low Total  : 3976852
  Low Free   : 1215628
  Mapped    : 516212
  NFS Unstable : 0
  Page Tables : 17096
  Slab      : 0
  VMmalloc Chunk : 1069542588
  VMmalloc Total : 1069547512
  VMmalloc Used : 2588
  Writeback  : 0
  HugePages Total: 0
  HugePages Free : 0
  HugePages Rsvd : 0
  HugePage Size : 2048

Swap (kB)
  Total : 0
  Used  : 0

```

show memory platform

```
Free          : 0
Cached        : 0

Buffers (kB)  : 438228

Load Average
1-Min         : 1.54
5-Min         : 1.27
15-Min        : 0.99
```

show module

To display module information such as switch number, model number, serial number, hardware revision number, software version, MAC address and so on, use this command in user EXEC or privileged EXEC mode.

```
show module [switch-num]
```

Syntax Description	<i>switch-num</i> (Optional) Number of the switch.				
Command Default	None				
Command Modes	User EXEC (>) Privileged EXEC (#)				
Command History	<table><thead><tr><th>Release</th><th>Modification</th></tr></thead><tbody><tr><td></td><td>This command was introduced.</td></tr></tbody></table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				
Usage Guidelines	Entering the show module command without the <i>switch-num</i> argument is the same as entering the show module all command.				

show mgmt-infra trace messages ilpower

To display inline power messages within a trace buffer, use the **show mgmt-infra trace messages ilpower** command in privileged EXEC mode.

show mgmt-infra trace messages ilpower [*switch stack-member-number*]

Syntax Description	switch <i>stack-member-number</i> (Optional) Specifies the stack member number for which to display inline power messages within a trace buffer.				
Command Default	None				
Command Modes	Privileged EXEC				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

This is an output example from the **show mgmt-infra trace messages ilpower** command:

```
# show mgmt-infra trace messages ilpower
[10/23/12 14:05:10.984 UTC 1 3] Initialized inline power system configuration fo
r slot 1.
[10/23/12 14:05:10.984 UTC 2 3] Initialized inline power system configuration fo
r slot 2.
[10/23/12 14:05:10.984 UTC 3 3] Initialized inline power system configuration fo
r slot 3.
[10/23/12 14:05:10.984 UTC 4 3] Initialized inline power system configuration fo
r slot 4.
[10/23/12 14:05:10.984 UTC 5 3] Initialized inline power system configuration fo
r slot 5.
[10/23/12 14:05:10.984 UTC 6 3] Initialized inline power system configuration fo
r slot 6.
[10/23/12 14:05:10.984 UTC 7 3] Initialized inline power system configuration fo
r slot 7.
[10/23/12 14:05:10.984 UTC 8 3] Initialized inline power system configuration fo
r slot 8.
[10/23/12 14:05:10.984 UTC 9 3] Initialized inline power system configuration fo
r slot 9.
[10/23/12 14:05:10.984 UTC a 3] Inline power subsystem initialized.
[10/23/12 14:05:18.908 UTC b 264] Create new power pool for slot 1
[10/23/12 14:05:18.909 UTC c 264] Set total inline power to 450 for slot 1
[10/23/12 14:05:20.273 UTC d 3] PoE is not supported on .
[10/23/12 14:05:20.288 UTC e 3] PoE is not supported on .
[10/23/12 14:05:20.299 UTC f 3] PoE is not supported on .
[10/23/12 14:05:20.311 UTC 10 3] PoE is not supported on .
[10/23/12 14:05:20.373 UTC 11 98] Inline power process post for switch 1
[10/23/12 14:05:20.373 UTC 12 98] PoE post passed on switch 1
[10/23/12 14:05:20.379 UTC 13 3] Slot #1: PoE initialization for board id 16387
[10/23/12 14:05:20.379 UTC 14 3] Set total inline power to 450 for slot 1
[10/23/12 14:05:20.379 UTC 15 3] Gi1/0/1 port config Initialized
[10/23/12 14:05:20.379 UTC 16 3] Interface Gi1/0/1 initialization done.
[10/23/12 14:05:20.380 UTC 17 3] Gi1/0/24 port config Initialized
[10/23/12 14:05:20.380 UTC 18 3] Interface Gi1/0/24 initialization done.
[10/23/12 14:05:20.380 UTC 19 3] Slot #1: initialization done.
```

```
[10/23/12 14:05:50.440 UTC 1a 3] Slot #1: PoE initialization for board id 16387  
[10/23/12 14:05:50.440 UTC 1b 3] Duplicate init event
```

show mgmt-infra trace messages ilpower-ha

To display inline power high availability messages within a trace buffer, use the **show mgmt-infra trace messages ilpower-ha** command in privileged EXEC mode.

show mgmt-infra trace messages ilpower-ha [**switch** *stack-member-number*]

Syntax Description	switch <i>stack-member-number</i> (Optional) Specifies the stack member number for which to display inline power messages within a trace buffer.				
Command Default	None				
Command Modes	Privileged EXEC				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

This is an output example from the **show mgmt-infra trace messages ilpower-ha** command:

```
# show mgmt-infra trace messages ilpower-ha
[10/23/12 14:04:48.087 UTC 1 3] NG3K_ILPOWER_HA: Created NGWC ILP CF client successfully.
```

show mgmt-infra trace messages platform-mgr-poe

To display platform manager Power over Ethernet (PoE) messages within a trace buffer, use the **show mgmt-infra trace messages platform-mgr-poe** privileged EXEC command.

show mgmt-infra trace messages platform-mgr-poe [*switch stack-member-number*]

Syntax Description	switch <i>stack-member-number</i> (Optional) Specifies the stack member number for which to display messages within a trace buffer.				
Command Default	None				
Command Modes	Privileged EXEC				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

This is an example of partial output from the **show mgmt-infra trace messages platform-mgr-poe** command:

```
# show mgmt-infra trace messages platform-mgr-poe
[10/23/12 14:04:06.431 UTC 1 5495] PoE Info: get power controller param sent:
[10/23/12 14:04:06.431 UTC 2 5495] PoE Info: POE_SHUT sent for port 1 (0:0)
[10/23/12 14:04:06.431 UTC 3 5495] PoE Info: POE_SHUT sent for port 2 (0:1)
[10/23/12 14:04:06.431 UTC 4 5495] PoE Info: POE_SHUT sent for port 3 (0:2)
[10/23/12 14:04:06.431 UTC 5 5495] PoE Info: POE_SHUT sent for port 4 (0:3)
[10/23/12 14:04:06.431 UTC 6 5495] PoE Info: POE_SHUT sent for port 5 (0:4)
[10/23/12 14:04:06.431 UTC 7 5495] PoE Info: POE_SHUT sent for port 6 (0:5)
[10/23/12 14:04:06.431 UTC 8 5495] PoE Info: POE_SHUT sent for port 7 (0:6)
[10/23/12 14:04:06.431 UTC 9 5495] PoE Info: POE_SHUT sent for port 8 (0:7)
[10/23/12 14:04:06.431 UTC a 5495] PoE Info: POE_SHUT sent for port 9 (0:8)
[10/23/12 14:04:06.431 UTC b 5495] PoE Info: POE_SHUT sent for port 10 (0:9)
[10/23/12 14:04:06.431 UTC c 5495] PoE Info: POE_SHUT sent for port 11 (0:10)
[10/23/12 14:04:06.431 UTC d 5495] PoE Info: POE_SHUT sent for port 12 (0:11)
[10/23/12 14:04:06.431 UTC e 5495] PoE Info: POE_SHUT sent for port 13 (e:0)
[10/23/12 14:04:06.431 UTC f 5495] PoE Info: POE_SHUT sent for port 14 (e:1)
[10/23/12 14:04:06.431 UTC 10 5495] PoE Info: POE_SHUT sent for port 15 (e:2)
[10/23/12 14:04:06.431 UTC 11 5495] PoE Info: POE_SHUT sent for port 16 (e:3)
[10/23/12 14:04:06.431 UTC 12 5495] PoE Info: POE_SHUT sent for port 17 (e:4)
[10/23/12 14:04:06.431 UTC 13 5495] PoE Info: POE_SHUT sent for port 18 (e:5)
[10/23/12 14:04:06.431 UTC 14 5495] PoE Info: POE_SHUT sent for port 19 (e:6)
[10/23/12 14:04:06.431 UTC 15 5495] PoE Info: POE_SHUT sent for port 20 (e:7)
[10/23/12 14:04:06.431 UTC 16 5495] PoE Info: POE_SHUT sent for port 21 (e:8)
[10/23/12 14:04:06.431 UTC 17 5495] PoE Info: POE_SHUT sent for port 22 (e:9)
[10/23/12 14:04:06.431 UTC 18 5495] PoE Info: POE_SHUT sent for port 23 (e:10)
```

show network-policy profile

To display the network-policy profiles, use the **show network policy profile** command in privileged EXEC mode.

show network-policy profile [*profile-number*] [**detail**]

Syntax Description

profile-number (Optional) Displays the network-policy profile number. If no profile is entered, all network-policy profiles appear.

detail (Optional) Displays detailed status and statistics information.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release

Modification

This command was introduced.

This is an example of output from the **show network-policy profile** command:

```
# show network-policy profile
Network Policy Profile 10
  voice vlan 17 cos 4
  Interface:
  none
Network Policy Profile 30
  voice vlan 30 cos 5
  Interface:
  none
Network Policy Profile 36
  voice vlan 4 cos 3
  Interface:
  Interface_id
```

show platform CAPWAP summary

To display the tunnel identifier and the type all the CAPWAP tunnels established by the controller to the access points and other mobility controllers, use the **show platform CAPWAP summary** command.

show platform CAPWAP summary

Syntax Description This command has no arguments or keywords.

Command Default

Command Modes Global configuration

Command History

Release Modification

This command was introduced.

This example displays the tunnel identifier and details:

```
# show platform capwap summary
Tunnel ID | Type | Src IP | Dst IP | SPrt | DPrt | S | A
-----
0x0088498000000983 data 9.6.44.61 9.12.138.101 5247 41894 1 1
0x00966dc000000010 data 9.6.44.61 9.6.47.101 5247 62526 1 2
0x00938e800000095b data 9.6.44.61 9.12.138.100 5247 45697 1 1
0x00ab1a8000000bd1 data 9.6.44.61 9.12.139.101 5247 38906 1 0
0x00896e40000000bd data 9.6.44.61 9.12.136.100 5247 1836 1 1
```

show platform forward

Use the **show platform forward** privileged EXEC command for an interface to display how the hardware would forward a frame that matches the specified parameters.

```
show platform forward interface-id [ vlan vlan-id ] src-macdst-mac [ l3protocol-id ] [ ipv6
| sap | snap ] [ cos cos [ ip src-ip dst-ip [ frag field ] [ dscp dscp ] { l4protocol-id |
icmp icmp-type icmp-code | igmp igmp-version igmp-type | sctp src-port dst-port | tcp src-post
dst-port flags | udp src-port dst-port ] } [ | { begin | exclude | include } expression ]
```

Syntax Description

<i>interface-id</i>	The input physical interface, the port on which the packet comes in to the switch (including type and port number).
vlan <i>vlan-id</i>	(Optional) Input VLAN ID. The range is 1 to 4094. If not specified, and the input interface is not a routed port, the default is 1.
<i>src-mac</i>	48-bit source MAC address.
<i>dst-mac</i>	48-bit destination MAC address.
ipv6	(Optional) IPv6 frame. This keyword is available only if the switch is running the IP services image.
sap	(Optional) Service access point (SAP) encapsulation type.
snap	(Optional) Subnetwork Access Protocol (SNAP) encapsulation type.
cos <i>cos</i>	(Optional) Class of service (CoS) value of the frame. The range is 0 to 7.
ip <i>src-ip</i> <i>dst-ip</i>	(Optional, but required for IP packets) Source and destination IP addresses in dotted decimal notation.
frag <i>field</i>	(Optional) The IP fragment field for a fragmented IP packet. The range is 0 to 65535.
dscp <i>dscp</i>	(Optional) Differentiated Services Code Point (DSCP) field in the IP header. The range is 0 to 63.
<i>l4protocol-id</i>	The numeric value of the Layer 4 protocol field in the IP header. The range is 0 to 255. For example, 47 is generic routing encapsulation (GRE), and 89 is Open Shortest Path First (OSPF). If the protocol is TCP, User Datagram Protocol (UDP), Internet Control Message Protocol (ICMP), or Internet Group Management Protocol (IGMP), you should use the appropriate keyword instead of a numeric value.
icmp <i>icmp-type</i> <i>icmp-code</i>	ICMP parameters. The <i>icmp-type</i> and <i>icmp-code</i> ranges are 0 to 255.
igmp <i>igmp-version</i> <i>igmp-type</i>	IGMP parameters. The <i>igmp-version</i> range is 1 to 15; the <i>igmp-type</i> range is 0 to 15.
sctp <i>src-port</i> <i>dst-port</i>	Stream Control Transmission Protocol (SCTP) parameters. The ranges for the SCTP source and destination ports are 0 to 65535.

tcp <i>src-port dst-port flags</i>	TCP parameters: TCP source port, destination port, and the numeric value of the TCP flags byte in the header. The src-port and dst-port ranges are 0 to 65535. The flag range is 0 to 1024.
udp <i>src-port dst-port</i>	UDP parameters. The src-port and dst-port ranges are 0 to 65535.
begin	(Optional) Display begins with the line that matches the <i>expression</i> .
exclude	(Optional) Display excludes lines that match the <i>expression</i> .
include	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Denali 16.1.1	This command was reintroduced.

Usage Guidelines You should use this command only when you are working directly with a technical support representative while troubleshooting a problem. Do not use this command unless a technical support representative asks you to do so.

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

show platform hardware fed switch forward

To display device-specific hardware information, use the **show platform hardware fed switch** *switch_number* command.

This topic elaborates only the forwarding-specific options, that is, the options available with the **show platform hardware fed switch** {*switch_num* | **active** | **standby** } **forward summary** command.

The output of the **show platform hardware fed switch** *switch_number* **forward summary** displays all the details about the forwarding decision taken for the packet.

show platform hardware fed switch *switch_num* | **active** | **standby** **forward summary**

Syntax Description

switch {*switch_num* | **active** | **standby** }

The switch for which you want to display information. You have the following options :

- *switch_num*—ID of the switch.
- **active**—Displays information relating to the active switch.
- **standby**—Displays information relating to the standby switch, if available.

forward summary

Displays packet forwarding information.

Note Support for the keyword **summary** has been discontinued in the release and later releases.

Command Modes

Privileged EXEC

Command History

Release

Modification

and later releases

This command was introduced.

Support for the keyword **summary** was discontinued.

Usage Guidelines

Do not use this command unless a technical support representative asks you to. Use this command only when you are working directly with a technical support representative while troubleshooting a problem.

Fields displayed in the command output are explained below.

- **Station Index** : The Station Index is the result of the layer 2 lookup and points to a station descriptor which provides the following:
 - **Destination Index** : Determines the egress port(s) to which the packets should be sent to. Global Port Number(GPN) can be used as the destination index. A destination index with 15 down to 12 bits set indicates the GPN to be used. For example, destination index - 0xF04E corresponds to GPN - 78 (0x4e).
 - **Rewrite Index** : Determines what needs to be done with the packets. For layer 2 switching, this is typically a bridging action

- Flexible Lookup Pipeline Stages(FPS) : Indicates the forwarding decision that was taken for the packet - routing or bridging
- Replication Bit Map : Determines if the packets should be sent to CPU or stack
 - Local Data Copy = 1
 - Remote Data copy = 0
 - Local CPU Copy = 0
 - Remote CPU Copy = 0

Example

This is an example of output from the **show platform hardware fed switch** {*switch_num* | **active** | **standby** } **forward summary** command.

```
#show platform hardware fed switch 1 forward summary
```

```
Time: Fri Sep 16 08:25:00 PDT 2016
```

```
Incoming Packet Details:
```

```
###[ Ethernet ]###
  dst      = 00:51:0f:f2:0e:11
  src      = 00:1d:01:85:ba:22
  type     = ARP
###[ ARP ]###
  hwtype   = 0x1
  ptype    = IPv4
  hwlen    = 6
  plen     = 4
  op       = is-at
  hwsrc    = 00:1d:01:85:ba:22
  psrc     = 10.10.1.33
  hwdst    = 00:51:0f:f2:0e:11
  pdst     = 10.10.1.1
```

```
Ingress:
Switch          : 1
Port            : GigabitEthernet1/0/1
Global Port Number : 1
Local Port Number : 1
Asic Port Number : 21
ASIC Number     : 0
STP state       :
                 blkLrn31to0: 0xffdffffd
                 blkFwd31to0: 0xffdffffd
Vlan            : 1
Station Descriptor : 170
DestIndex       : 0xF009
DestModIndex    : 2
RewriteIndex    : 2
Forwarding Decision: FPS 2A L2 Destination
```

```
Replication Bitmap:
Local CPU copy   : 0
Local Data copy  : 1
Remote CPU copy  : 0
Remote Data copy : 0
```

```
show platform hardware fed switch forward
```

```
Egress:  
Switch          : 1  
Outgoing Port   : GigabitEthernet1/0/9  
Global Port Number : 9  
ASIC Number     : 0  
Vlan            : 1
```

show platform resources

To display platform resource information, use the **show platform resources** command in privileged EXEC mode.

show platform resources

This command has no arguments or keywords.

Command Modes Privileged EXEC (#)

Command History **Release Modification**

This command was introduced.

Usage Guidelines The output of this command displays the used memory, which is total memory minus the accurate free memory.

Example

The following is sample output from the **show platform resources** command:

```
Switch# show platform resources
```

```
**State Acronym: H - Healthy, W - Warning, C - Critical
```

Resource State	Usage	Max	Warning	Critical
Control Processor H	7.20%	100%	90%	95%
DRAM H	2701MB (69%)	3883MB	90%	95%

show platform software ilpower

To display the inline power details of all the PoE ports on the device, use the **show platform software ilpower** command in privileged EXEC mode.

show platform software ilpower { **details** | **port** { **GigabitEthernet** *interface-number* } | **system** *slot-number* }

Syntax Description	Parameter	Description
	details	Displays inline power details for all the interfaces.
	port	Displays inline power port configuration.
	GigabitEthernet <i>interface-number</i>	The GigabitEthernet interface number. Values range from 0 to 9.
	system <i>slot-number</i>	Displays inline power system configuration.

Command Modes Privileged EXEC (#)

Command History	Release	Modification
		The command was introduced.

Examples

The following is sample output from the **show platform software ilpower details** command:

```
Device# show platform software ilpower details
ILP Port Configuration for interface Gi1/0/1
  Initialization Done:   Yes
  ILP Supported:        Yes
  ILP Enabled:          Yes
  POST:                 Yes
  Detect On:            No
  Powered Device Detected           No
  Powered Device Class Done         No
  Cisco Powered Device:             No
  Power is On:                      No
  Power Denied:                     No
  Powered Device Type:               Null
  Powerd Device Class:               Null
  Power State:                       NULL
  Current State:                     NGWC_ILP_DETECTING_S
  Previous State:                     NGWC_ILP_SHUT_OFF_S
  Requested Power in milli watts:    0
  Short Circuit Detected:             0
  Short Circuit Count:                0
  Cisco Powerd Device Detect Count:  0
  Spare Pair mode:                   0
    IEEE Detect:                      Stopped
    IEEE Short:                       Stopped
    Link Down:                        Stopped
    Voltage sense:                     Stopped
  Spare Pair Architecture:           1
  Signal Pair Power allocation in milli watts: 0
  Spare Pair Power On:               0
  Powered Device power state:        0
  Timer:
```

```
Power Good:          Stopped
Power Denied:        Stopped
Cisco Powered Device Detect:  Stopped
```

show platform software process list

To display the list of running processes on a platform, use the **show platform software process list** command in privileged EXEC mode.

show platform software process list switch *switch-number* | **active** | **standby 0** | **F0** | **R0** [**name** *process-name* | **process-id** *process-ID* | **sort memory** | **summary**]

Syntax Description

switch <i>switch-number</i>	Displays information about the switch. Valid values for <i>switch-number</i> argument are from 0 to 9.
active	Displays information about the active instance of the switch.
standby	Displays information about the standby instance of the switch.
0	Displays information about the shared port adapters (SPA) Interface Processor slot 0.
F0	Displays information about the Embedded Service Processor (ESP) slot 0.
R0	Displays information about the Route Processor (RP) slot 0.
name <i>process-name</i>	(Optional) Displays information about the specified process. Enter the process name.
process-id <i>process-ID</i>	(Optional) Displays information about the specified process ID. Enter the process ID.
sort	(Optional) Displays information sorted according to processes.
memory	(Optional) Displays information sorted according to memory.
summary	(Optional) Displays a summary of the process memory of the host device.

Command Modes

Privileged EXE (#)

Command History

Release Modification

The command was introduced.

Examples

The following is sample output from the **show platform software process list switch active R0** command:

```
Switch# show platform software process list switch active R0 summary
```

```
Total number of processes: 278
Running           : 2
Sleeping          : 276
Disk sleeping     : 0
Zombies           : 0
Stopped           : 0
Paging            : 0

Up time           : 8318
```

```

Idle time      : 0
User time     : 216809
Kernel time   : 78931

Virtual memory : 12933324800
Pages resident : 634061
Major page faults: 2228
Minor page faults: 3491744

Architecture   : mips64
Memory (kB)
  Physical     : 3976852
  Total       : 3976852
  Used        : 2766952
  Free        : 1209900
  Active      : 2141344
  Inactive    : 1589672
  Inact-dirty : 0
  Inact-clean : 0
  Dirty       : 4
  AnonPages   : 1306800
  Bounce      : 0
  Cached      : 1984688
  Commit Limit : 1988424
  Committed As : 3358528
  High Total  : 0
  High Free   : 0
  Low Total   : 3976852
  Low Free    : 1209900
  Mapped      : 520528
  NFS Unstable : 0
  Page Tables : 17328
  Slab        : 0
  VMmalloc Chunk : 1069542588
  VMmalloc Total : 1069547512
  VMmalloc Used : 2588
  Writeback   : 0
  HugePages Total: 0
  HugePages Free : 0
  HugePages Rsvd : 0
  HugePage Size : 2048

Swap (kB)
  Total       : 0
  Used        : 0
  Free        : 0
  Cached      : 0

Buffers (kB)   : 439528

Load Average
  1-Min       : 1.13
  5-Min       : 1.18
  15-Min      : 0.92

```

The following is sample output from the **show platform software process list switch active R0** command:

```

Device# show platform software process list switch active R0
Name          Pid    PPid  Group Id  Status  Priority  Size
-----

```

show platform software process list

```

systemd                1      0      1  S                20  7892
kthreadd               2      0      0  S                20   0
ksoftirqd/0           3      2      0  S                20   0
kworker/0:0H          5      2      0  S                0   0
rcu_sched              7      2      0  S                20   0
rcu_bh                 8      2      0  S                20   0
migration/0           9      2      0  S          4294967196  0
migration/1          10     2      0  S          4294967196  0
ksoftirqd/1          11     2      0  S                20   0
kworker/1:0H         13     2      0  S                0   0
migration/2          14     2      0  S          4294967196  0
ksoftirqd/2          15     2      0  S                20   0
kworker/2:0H         17     2      0  S                0   0
systemd-journal      221    1      221 S                20  4460
kworker/1:3          246    2      0  S                20   0
systemd-udevd        253    1      253 S                20  5648
kvm-irqfd-clean      617    2      0  S                0   0
scsi_eh_6             620    2      0  S                20   0
scsi_tmf_6            621    2      0  S                0   0
usb-storage           622    2      0  S                20   0
scsi_eh_7             625    2      0  S                20   0
scsi_tmf_7            626    2      0  S                0   0
usb-storage           627    2      0  S                20   0
kworker/7:1          630    2      0  S                20   0
bioset                631    2      0  S                0   0
kworker/3:1H         648    2      0  S                0   0
kworker/0:1H         667    2      0  S                0   0
kworker/1:1H         668    2      0  S                0   0
bioset                669    2      0  S                0   0
kworker/6:2          698    2      0  S                20   0
kworker/2:2          699    2      0  S                20   0
kworker/2:1H         703    2      0  S                0   0
kworker/7:1H         748    2      0  S                0   0
kworker/5:1H         749    2      0  S                0   0
kworker/6:1H         754    2      0  S                0   0
kworker/7:2          779    2      0  S                20   0
auditd                838    1      838 S                16  2564
.
.
.

```

The table below describes the significant fields shown in the displays.

Table 5: show platform software process list Field Descriptions

Field	Description
Name	Displays the command name associated with the process. Different threads in the same process may have different command values.
Pid	Displays the process ID that is used by the operating system to identify and keep track of the processes.
PPid	Displays process ID of the parent process.
Group Id	Displays the group ID
Status	Displays the process status in human readable form.

Field	Description
Priority	Displays the negated scheduling priority.
Size	Prior to Cisco IOS XE Gibraltar 16.10.1: Displays Virtual Memory size. From Cisco IOS XE Gibraltar 16.10.1 onwards: Displays the Resident Set Size (RSS) that shows how much memory is allocated to that process in the RAM.

show platform software process slot switch

To display platform software process switch information, use the **show platform software process slot switch** command in privileged EXEC mode.

show platform software process slot switch *switch-number* | **active** | **standby 0** | **F0** | **R0** **monitor** [*cycles no-of-times* [*interval delay* [*lines number*]]]

Syntax Description

<i>switch-number</i>	Switch number.
active	Specifies the active instance.
standby	Specifies the standby instance.
0	Specifies the shared port adapter (SPA) interface processor slot 0.
F0	Specifies the Embedded Service Processor (ESP) slot 0.
R0	Specifies the Route Processor (RP) slot 0.
monitor	Monitors the running processes.
<i>cycles no-of-times</i>	(Optional) Sets the number of times to run monitor command. Valid values are from 1 to 4294967295. The default is 5.
<i>interval delay</i>	(Optional) Sets a delay after each . Valid values are from 0 to 300. The default is 3.
<i>lines number</i>	(Optional) Sets the number of lines of output displayed. Valid values are from 0 to 512. The default is 0.

Command Modes

Privileged EXEC (#)

Command History

Release Modification

This command was introduced.

Usage Guidelines

The output of the **show platform software process slot switch** and **show processes cpu platform monitor location** commands display the output of the Linux **top** command. The output of these commands display Free memory and Used memory as displayed by the Linux **top** command. The values displayed for the Free memory and Used memory by these commands do not match the values displayed by the output of other platform-memory related CLIs.

Examples

The following is sample output from the **show platform software process slot switch active R0 monitor** command:

```
Switch# show platform software process slot switch active R0 monitor
```

```
top - 00:01:52 up 1 day, 11:20, 0 users, load average: 0.50, 0.68, 0.83
Tasks: 311 total, 2 running, 309 sleeping, 0 stopped, 0 zombie
Cpu(s): 7.4%us, 3.3%sy, 0.0%ni, 89.2%id, 0.0%wa, 0.0%hi, 0.1%si, 0.0%st
Mem: 3976844k total, 3955036k used, 21808k free, 419312k buffers
Swap: 0k total, 0k used, 0k free, 1946764k cached
```

```

PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
 5693 root       20   0   3448 1368  912  R   7   0.0    0:00.07 top
17546 root       20   0 2044m 244m  79m  S   7   6.3   186:49.08 fed main event
18662 root       20   0 1806m 678m 263m  S   5  17.5   215:32.38 linux_iods-imag
30276 root       20   0  171m  42m  33m  S   5   1.1   125:06.77 repm
17835 root       20   0  935m  74m  63m  S   4   1.9    82:28.31 sif_mgr
18534 root       20   0  182m 150m  10m  S   2   3.9    8:12.08 smand
   1 root       20   0  8440 4740 2184  S   0   0.1    0:09.52 systemd
   2 root       20   0    0    0    0  S   0   0.0    0:00.00 kthreadd
   3 root       20   0    0    0    0  S   0   0.0    0:02.86 ksoftirqd/0
   5 root        0  -20    0    0    0  S   0   0.0    0:00.00 kworker/0:0H
   7 root       RT   0    0    0    0  S   0   0.0    0:01.44 migration/0
   8 root       20   0    0    0    0  S   0   0.0    0:00.00 rcu_bh
   9 root       20   0    0    0    0  S   0   0.0    0:23.08 rcu_sched
  10 root       20   0    0    0    0  S   0   0.0    0:58.04 rcuc/0
  11 root       20   0    0    0    0  S   0   0.0   21:35.60 rcuc/1
  12 root       RT   0    0    0    0  S   0   0.0    0:01.33 migration/1

```

Related Commands

Command	Description
show processes cpu platform monitor location	Displays information about the CPU utilization of the IOS-XE processes.

show platform software status control-processor

To display platform software control-processor status, use the **show platform software status control-processor** command in privileged EXEC mode.

show platform software status control-processor [brief]

Syntax Description	brief (Optional) Displays a summary of the platform control-processor status.
---------------------------	--

Command Modes	Privileged EXEC (#)
----------------------	---------------------

Command History	Release Modification
	This command was introduced.

Examples

The following is sample output from the **show platform memory software status control-processor** command:

```
Switch# show platform software status control-processor

2-RP0: online, statistics updated 7 seconds ago
Load Average: healthy
  1-Min: 1.00, status: healthy, under 5.00
  5-Min: 1.21, status: healthy, under 5.00
 15-Min: 0.90, status: healthy, under 5.00
Memory (kb): healthy
  Total: 3976852
  Used: 2766284 (70%), status: healthy
  Free: 1210568 (30%)
  Committed: 3358008 (84%), under 95%
Per-core Statistics
CPU0: CPU Utilization (percentage of time spent)
  User: 4.40, System: 1.70, Nice: 0.00, Idle: 93.80
  IRQ: 0.00, SIRQ: 0.10, IOWait: 0.00
CPU1: CPU Utilization (percentage of time spent)
  User: 3.80, System: 1.20, Nice: 0.00, Idle: 94.90
  IRQ: 0.00, SIRQ: 0.10, IOWait: 0.00
CPU2: CPU Utilization (percentage of time spent)
  User: 7.00, System: 1.10, Nice: 0.00, Idle: 91.89
  IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU3: CPU Utilization (percentage of time spent)
  User: 4.49, System: 0.69, Nice: 0.00, Idle: 94.80
  IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00

3-RP0: unknown, statistics updated 2 seconds ago
Load Average: healthy
  1-Min: 0.24, status: healthy, under 5.00
  5-Min: 0.27, status: healthy, under 5.00
 15-Min: 0.32, status: healthy, under 5.00
Memory (kb): healthy
  Total: 3976852
  Used: 2706768 (68%), status: healthy
  Free: 1270084 (32%)
  Committed: 3299332 (83%), under 95%
Per-core Statistics
CPU0: CPU Utilization (percentage of time spent)
```

```

User: 4.50, System: 1.20, Nice: 0.00, Idle: 94.20
IRQ: 0.00, SIRQ: 0.10, IOWait: 0.00
CPU1: CPU Utilization (percentage of time spent)
User: 5.20, System: 0.50, Nice: 0.00, Idle: 94.29
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU2: CPU Utilization (percentage of time spent)
User: 3.60, System: 0.70, Nice: 0.00, Idle: 95.69
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU3: CPU Utilization (percentage of time spent)
User: 3.00, System: 0.60, Nice: 0.00, Idle: 96.39
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00

4-RP0: unknown, statistics updated 2 seconds ago
Load Average: healthy
  1-Min: 0.21, status: healthy, under 5.00
  5-Min: 0.24, status: healthy, under 5.00
 15-Min: 0.24, status: healthy, under 5.00
Memory (kb): healthy
Total: 3976852
Used: 1452404 (37%), status: healthy
Free: 2524448 (63%)
Committed: 1675120 (42%), under 95%
Per-core Statistics
CPU0: CPU Utilization (percentage of time spent)
User: 2.30, System: 0.40, Nice: 0.00, Idle: 97.30
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU1: CPU Utilization (percentage of time spent)
User: 4.19, System: 0.69, Nice: 0.00, Idle: 95.10
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU2: CPU Utilization (percentage of time spent)
User: 4.79, System: 0.79, Nice: 0.00, Idle: 94.40
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU3: CPU Utilization (percentage of time spent)
User: 2.10, System: 0.40, Nice: 0.00, Idle: 97.50
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00

9-RP0: unknown, statistics updated 4 seconds ago
Load Average: healthy
  1-Min: 0.20, status: healthy, under 5.00
  5-Min: 0.35, status: healthy, under 5.00
 15-Min: 0.35, status: healthy, under 5.00
Memory (kb): healthy
Total: 3976852
Used: 1451328 (36%), status: healthy
Free: 2525524 (64%)
Committed: 1675932 (42%), under 95%
Per-core Statistics
CPU0: CPU Utilization (percentage of time spent)
User: 1.90, System: 0.50, Nice: 0.00, Idle: 97.60
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU1: CPU Utilization (percentage of time spent)
User: 4.39, System: 0.19, Nice: 0.00, Idle: 95.40
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU2: CPU Utilization (percentage of time spent)
User: 5.70, System: 1.00, Nice: 0.00, Idle: 93.30
IRQ: 0.00, SIRQ: 0.00, IOWait: 0.00
CPU3: CPU Utilization (percentage of time spent)
User: 1.30, System: 0.60, Nice: 0.00, Idle: 98.00
IRQ: 0.00, SIRQ: 0.10, IOWait: 0.00

```

The following is sample output from the **show platform memory software status control-processor brief** command:

show platform software status control-processor

Switch# show platform software status control-processor brief

Load Average

Slot	Status	1-Min	5-Min	15-Min
2-RP0	Healthy	1.10	1.21	0.91
3-RP0	Healthy	0.23	0.27	0.31
4-RP0	Healthy	0.11	0.21	0.22
9-RP0	Healthy	0.10	0.30	0.34

Memory (kB)

Slot	Status	Total	Used (Pct)	Free (Pct)	Committed (Pct)
2-RP0	Healthy	3976852	2766956 (70%)	1209896 (30%)	3358352 (84%)
3-RP0	Healthy	3976852	2706824 (68%)	1270028 (32%)	3299276 (83%)
4-RP0	Healthy	3976852	1451888 (37%)	2524964 (63%)	1675076 (42%)
9-RP0	Healthy	3976852	1451580 (37%)	2525272 (63%)	1675952 (42%)

CPU Utilization

Slot	CPU	User	System	Nice	Idle	IRQ	SIRQ	IOWait
2-RP0	0	4.10	2.00	0.00	93.80	0.00	0.10	0.00
	1	4.60	1.00	0.00	94.30	0.00	0.10	0.00
	2	6.50	1.10	0.00	92.40	0.00	0.00	0.00
	3	5.59	1.19	0.00	93.20	0.00	0.00	0.00
3-RP0	0	2.80	1.20	0.00	95.90	0.00	0.10	0.00
	1	4.49	1.29	0.00	94.20	0.00	0.00	0.00
	2	5.30	1.60	0.00	93.10	0.00	0.00	0.00
4-RP0	3	5.80	1.20	0.00	93.00	0.00	0.00	0.00
	0	1.30	0.80	0.00	97.89	0.00	0.00	0.00
	1	1.30	0.20	0.00	98.50	0.00	0.00	0.00
9-RP0	2	5.60	0.80	0.00	93.59	0.00	0.00	0.00
	3	5.09	0.19	0.00	94.70	0.00	0.00	0.00
	0	3.99	0.69	0.00	95.30	0.00	0.00	0.00
	1	2.60	0.70	0.00	96.70	0.00	0.00	0.00
9-RP0	2	4.49	0.89	0.00	94.60	0.00	0.00	0.00
	3	2.60	0.20	0.00	97.20	0.00	0.00	0.00

show processes cpu platform monitor

To displays information about the CPU utilization of the IOS-XE processes, use the **show processes cpu platform monitor** command in privileged EXEC mode.

show processes cpu platform monitor location switch *switch-number* | **active** | **standby** **0** | **F0** | **R0**

Syntax	Description
location	Displays information about the Field Replaceable Unit (FRU) location.
switch	Specifies the switch.
<i>switch-number</i>	Switch number.
active	Specifies the active instance.
standby	Specifies the standby instance.
0	Specifies the shared port adapter (SPA) interface processor slot 0.
F0	Specifies the Embedded Service Processor (ESP) slot 0.
R0	Specifies the Route Processor (RP) slot 0.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Usage Guidelines The output of the **show platform software process slot switch** and **show processes cpu platform monitor location** commands display the output of the Linux **top** command. The output of these commands display Free memory and Used memory as displayed by the Linux **top** command. The values displayed for the Free memory and Used memory by these commands do not match the values displayed by the output of other platform-memory related CLIs.

Examples

The following is sample output from the **show processes cpu monitor location switch active R0** command:

```
Switch# show processes cpu platform monitor location switch active R0

top - 00:04:21 up 1 day, 11:22,  0 users,  load average: 0.42, 0.60, 0.78
Tasks: 312 total,  4 running, 308 sleeping,  0 stopped,  0 zombie
Cpu(s):  7.4%us,  3.3%sy,  0.0%ni, 89.2%id,  0.0%wa,  0.0%hi,  0.1%si,  0.0%st
Mem:   3976844k total, 3956928k used,    19916k free,   419312k buffers
Swap:          0k total,          0k used,          0k free,   1947036k cached

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
  6294 root        20   0  3448 1368  912  R   9.0   0.0   0:00.07 top
 17546 root        20   0 2044m 244m  79m  S   6.3 187:02.07 fed main event
 30276 root        20   0  171m  42m  33m  S   7.1  1.1 125:15.54 repm
    16 root        20   0     0     0     0  S   5.0  0.0  22:07.92 rcuc/2
    21 root        20   0     0     0     0  R   5.0  0.0  22:13.24 rcuc/3
 18662 root        20   0 1806m 678m 263m  R   5.0 17.5 215:47.59 linux_iods-imag
```

show processes cpu platform monitor

```

 11 root      20  0    0    0    0 S    4  0.0  21:37.41 rcuc/1
10333 root      20  0  6420 3916 1492 S    4  0.1   4:47.03 btrace_rotate.s
 10 root      20  0    0    0    0 S    2  0.0   0:58.13 rcuc/0
 6304 root      20  0   776   12    0 R    2  0.0   0:00.01 ls
17835 root      20  0  935m  74m   63m S    2  1.9  82:34.07 sif_mgr
   1 root      20  0  8440 4740 2184 S    0  0.1   0:09.52 systemd
   2 root      20  0    0    0    0 S    0  0.0   0:00.00 kthreadd
   3 root      20  0    0    0    0 S    0  0.0   0:02.86 ksoftirqd/0
   5 root       0 -20    0    0    0 S    0  0.0   0:00.00 kworker/0:0H
   7 root      RT  0    0    0    0 S    0  0.0   0:01.44 migration/0

```

Related Commands

Command	Description
show platform software process slot switch	Displays platform software process switch information.

show processes memory platform

To display memory usage per Cisco IOS XE process, use the **show processes memory platform** command in privileged EXEC mode.

show processes memory platform [**detailed name** *process-name* | **process-id** *process-ID* [**location** | **maps** [*location*] | **smaps** [*location*]] | **location** | **sorted** [*location*]] **switch** *switch-number* | **active** | **standby** **0** | **F0** | **R0**

Syntax	Description
detailed <i>process-name</i>	(Optional) Displays detailed memory information for a specified Cisco IOS XE process.
name <i>process-name</i>	(Optional) Matches the Cisco IOS XE process name.
process-id <i>process-ID</i>	(Optional) Matches the Cisco IOS XE process ID.
location	(Optional) Displays information about the FRU location.
maps	(Optional) Displays memory maps of a process.
smaps	(Optional) Displays smaps of a process.
sorted	(Optional) Displays the sorted output based on the total memory used by Cisco IOS XE processes.
switch <i>switch-number</i>	Displays information about the device.
active	Displays information about the active instance of the switch.
standby	Displays information about the standby instance of the switch.
0	Displays information about the SPA-Inter-Processor slot 0.
F0	Displays information about the Embedded Service Processor (ESP) slot 0.
R0	Displays information about the Route Processor (RP) slot 0.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
	The command was introduced.

Examples

The following is sample output from the **show processes memory platform** command:

show processes memory platform

```
Switch# show processes memory platform
```

```
System memory: 3976852K total, 2761580K used, 1215272K free,
Lowest: 1215272K
```

Pid	Text	Data	Stack	Dynamic	RSS	Total	Name
1	1246	4400	132	1308	4400	8328	systemd
96	233	2796	132	132	2796	12436	systemd-journal
105	284	1796	132	176	1796	5208	systemd-udev
707	52	2660	132	172	2660	11688	in.telnetd
744	968	3264	132	1700	3264	5800	brelay.sh
835	52	2660	132	172	2660	11688	in.telnetd
863	968	3264	132	1700	3264	5800	brelay.sh
928	968	3996	132	2312	3996	6412	reflector.sh
933	968	3976	132	2312	3976	6412	droputil.sh
934	968	2140	132	528	2140	4628	oom.sh
936	173	936	132	132	936	3068	xinetd
945	968	1472	132	132	1472	4168	libvirtd.sh
947	592	43164	132	3096	43164	154716	repm
954	45	932	132	132	932	3132	rpcbind
986	482	3476	132	132	3476	169288	libvirtd
988	66	940	132	132	940	2724	rpc.statd
993	968	928	132	132	928	4232	boothelper_evt.
1017	21	640	132	132	640	2500	inotifywait
1089	102	1200	132	132	1200	3328	rpc.mountd
1328	9	2940	132	148	2940	13844	rotee
1353	39	532	132	132	532	2336	sleep

```
!
!
!
```

The following is sample output from the **show processes memory platform information** command:

```
Switch# show processes memory platform location switch active R0
```

```
System memory: 3976852K total, 2762844K used, 1214008K free,
Lowest: 1214008K
```

Pid	Text	Data	Stack	Dynamic	RSS	Total	Name
1	1246	4400	132	1308	4400	8328	systemd
96	233	2796	132	132	2796	12436	systemd-journal
105	284	1796	132	176	1796	5208	systemd-udev
707	52	2660	132	172	2660	11688	in.telnetd
744	968	3264	132	1700	3264	5800	brelay.sh
835	52	2660	132	172	2660	11688	in.telnetd
863	968	3264	132	1700	3264	5800	brelay.sh
928	968	3996	132	2312	3996	6412	reflector.sh
933	968	3976	132	2312	3976	6412	droputil.sh

```
!
!
!
```

The following is sample output from the **show processes memory platform sorted** command:

```
Switch# show processes memory platform sorted
```

```
System memory: 3976852K total, 2762884K used, 1213968K free,
Lowest: 1213968K
```

Pid	Text	Data	Stack	Dynamic	RSS	Total	Name
9655	3787	264964	136	18004	264964	2675968	wcm
17261	324	248588	132	103908	248588	2093076	fed main event

```

7885 149848 684864 136 80 684864 1853548 linux_iosd-imag
17891 398 75772 136 1888 75772 958240 sif_mgr
17067 1087 77912 136 1796 77912 702184 platform_mgr
4268 391 102084 136 5596 102084 482656 cli_agent
4856 357 93388 132 3680 93388 340052 dbm
29842 8722 64428 132 8056 64428 297068 fman_fp_image
5960 9509 76088 136 3200 76088 287156 fman_rp
!
!
!
```

The following is sample output from the **show processes memory platform sorted location switch active R0** command:

```
Switch# show processes memory platform sorted location switch active R0
```

```
System memory: 3976852K total, 2763584K used, 1213268K free,
Lowest: 1213268K
```

Pid	Text	Data	Stack	Dynamic	RSS	Total	Name
9655	3787	264968	136	18004	264968	2675968	wcm
17261	324	249020	132	103908	249020	2093076	fed main event
7885	149848	684912	136	80	684912	1853548	linux_iosd-imag
17891	398	75884	136	1888	75884	958240	sif_mgr
17067	1087	77820	136	1796	77820	702184	platform_mgr
4268	391	102084	136	5596	102084	482656	cli_agent
4856	357	93388	132	3680	93388	340052	dbm
29842	8722	64428	132	8056	64428	297068	fman_fp_image
5960	9509	76088	136	3200	76088	287156	fman_rp

```

!
!
!
```

show power inline

To display the Power over Ethernet (PoE) status for the specified PoE port, the specified stack member, or for all PoE ports in the switch stack, use the **show power inline** command in EXEC mode.

show power inline [**police** | **priority**] [*interface-id* | **module** *stack-member-number*] [**detail**]

Syntax Description		
police	(Optional) Displays the power policing information about real-time power consumption.	
priority	(Optional) Displays the power inline port priority for each port.	
<i>interface-id</i>	(Optional) ID of the physical interface.	
module <i>stack-member-number</i>	(Optional) Limits the display to ports on the specified stack member. This keyword is supported only on stacking-capable switches.	
detail	(Optional) Displays detailed output of the interface or module.	

Command Modes	
	User EXEC
	Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Examples

This is an example of output from the **show power inline** command. The table that follows describes the output fields.

```
> show power inline
Module    Available    Used    Remaining
         (Watts)      (Watts) (Watts)
-----
1         n/a         n/a     n/a
2         n/a         n/a     n/a
3         1440.0      15.4    1424.6
4         720.0       6.3     713.7
Interface Admin Oper      Power Device      Class Max
         (Watts)
-----
Gi3/0/1  auto  off      0.0  n/a         n/a  30.0
Gi3/0/2  auto  off      0.0  n/a         n/a  30.0
Gi3/0/3  auto  off      0.0  n/a         n/a  30.0
Gi3/0/4  auto  off      0.0  n/a         n/a  30.0
Gi3/0/5  auto  off      0.0  n/a         n/a  30.0
Gi3/0/6  auto  off      0.0  n/a         n/a  30.0
Gi3/0/7  auto  off      0.0  n/a         n/a  30.0
Gi3/0/8  auto  off      0.0  n/a         n/a  30.0
Gi3/0/9  auto  off      0.0  n/a         n/a  30.0
Gi3/0/10 auto  off      0.0  n/a         n/a  30.0
```

```

Gi3/0/11 auto off 0.0 n/a n/a 30.0
Gi3/0/12 auto off 0.0 n/a n/a 30.0
<output truncated>

```

This is an example of output from the **show power inline interface-id** command on a switch port:

This is an example of output from the **show power inline module switch-number** command on stack member 3. The table that follows describes the output fields.

```

> show power inline module 3
Module Available Used Remaining
(Watts) (Watts) (Watts)
-----
3 865.0 864.0 1.0
Interface Admin Oper Power Device Class Max
(Watts)
-----
Gi3/0/1 auto power-deny 4.0 n/a n/a 15.4
Gi3/0/2 auto off 0.0 n/a n/a 15.4
Gi3/0/3 auto off 0.0 n/a n/a 15.4
Gi3/0/4 auto off 0.0 n/a n/a 15.4
Gi3/0/5 auto off 0.0 n/a n/a 15.4
Gi3/0/6 auto off 0.0 n/a n/a 15.4
Gi3/0/7 auto off 0.0 n/a n/a 15.4
Gi3/0/8 auto off 0.0 n/a n/a 15.4
Gi3/0/9 auto off 0.0 n/a n/a 15.4
Gi3/0/10 auto off 0.0 n/a n/a 15.4
<output truncated>

```

Table 6: show power inline Field Descriptions

Field	Description
Available	The total amount of configured power ⁴ on the PoE switch in watts (W).
Used	The amount of configured power that is allocated to PoE ports in watts.
Remaining	The amount of configured power in watts that is not allocated to ports in the system. (Available – Used = Remaining)
Admin	Administration mode: auto, off, static.
Oper	Operating mode: <ul style="list-style-type: none"> • on—The powered device is detected, and power is applied. • off—No PoE is applied. • faulty—Device detection or a powered device is in a faulty state. • power-deny—A powered device is detected, but no PoE is available, or the maximum wattage exceeds the detected powered-device maximum.
Power	The maximum amount of power that is allocated to the powered device in watts. This value is the same as the value in the <i>Cutoff Power</i> field in the show power inline police command output.

Field	Description
Device	The device type detected: n/a, unknown, Cisco powered-device, IEEE powered-device, or the name from CDP.
Class	The IEEE classification: n/a or a value from 0 to 4.
Max	The maximum amount of power allocated to the powered device in watts.
AdminPowerMax	The maximum amount power allocated to the powered device in watts when the switch polices the real-time power consumption. This value is the same as the <i>Max</i> field value.
AdminConsumption	The power consumption of the powered device in watts when the switch polices the real-time power consumption. If policing is disabled, this value is the same as the <i>AdminPowerMax</i> field value.

- ⁴ The configured power is the power that you manually specify or that the switch specifies by using CDP power negotiation or the IEEE classification, which is different than the real-time power that is monitored with the power sensing feature.

This is an example of output from the **show power inline police** command on a stacking-capable switch:

```
> show power inline police
Module    Available    Used    Remaining
          (Watts)     (Watts) (Watts)
-----
1         370.0       0.0    370.0
3         865.0       864.0   1.0

Interface  Admin  Oper    Admin    Oper    Cutoff  Oper
          State State    Police   Police   Power   Power
-----
Gi1/0/1   auto  off     none     n/a     n/a     0.0
Gi1/0/2   auto  off     log      n/a     5.4     0.0
Gi1/0/3   auto  off     errdisable n/a     5.4     0.0
Gi1/0/4   off   off     none     n/a     n/a     0.0
Gi1/0/5   off   off     log      n/a     5.4     0.0
Gi1/0/6   off   off     errdisable n/a     5.4     0.0
Gi1/0/7   auto  off     none     n/a     n/a     0.0
Gi1/0/8   auto  off     log      n/a     5.4     0.0
Gi1/0/9   auto  on      none     n/a     n/a     5.1
Gi1/0/10  auto  on      log      ok      5.4     4.2
Gi1/0/11  auto  on      log      log     5.4     5.9
Gi1/0/12  auto  on      errdisable ok      5.4     4.2
Gi1/0/13  auto  errdisable errdisable n/a     5.4     0.0
<output truncated>
```

In the previous example:

- The Gi1/0/1 port is shut down, and policing is not configured.
- The Gi1/0/2 port is shut down, but policing is enabled with a policing action to generate a syslog message.
- The Gi1/0/3 port is shut down, but policing is enabled with a policing action is to shut down the port.
- Device detection is disabled on the Gi1/0/4 port, power is not applied to the port, and policing is disabled.

- Device detection is disabled on the Gi1/0/5 port, and power is not applied to the port, but policing is enabled with a policing action to generate a syslog message.
- Device detection is disabled on the Gi1/0/6 port, and power is not applied to the port, but policing is enabled with a policing action to shut down the port.
- The Gi1/0/7 port is up, and policing is disabled, but the switch does not apply power to the connected device.
- The Gi1/0/8 port is up, and policing is enabled with a policing action to generate a syslog message, but the switch does not apply power to the powered device.
- The Gi1/0/9 port is up and connected to a powered device, and policing is disabled.
- The Gi1/0/10 port is up and connected to a powered device, and policing is enabled with a policing action to generate a syslog message. The policing action does not take effect because the real-time power consumption is less than the cutoff value.
- The Gi1/0/11 port is up and connected to a powered device, and policing is enabled with a policing action to generate a syslog message.
- The Gi1/0/12 port is up and connected to a powered device, and policing is enabled with a policing action to shut down the port. The policing action does not take effect because the real-time power consumption is less than the cutoff value.
- The Gi1/0/13 port is up and connected to a powered device, and policing is enabled with a policing action to shut down the port.

This is an example of output from the **show power inline police** *interface-id* command on a standalone switch. The table that follows describes the output fields.

Table 7: show power inline police Field Descriptions

Field	Description
Available	The total amount of configured power ⁵ on the switch in watts (W).
Used	The amount of configured power allocated to PoE ports in watts.
Remaining	The amount of configured power in watts that is not allocated to ports in the system. (Available – Used = Remaining)
Admin State	Administration mode: auto, off, static.
Oper State	<p>Operating mode:</p> <ul style="list-style-type: none"> • errdisable—Policing is enabled. • faulty—Device detection on a powered device is in a faulty state. • off—No PoE is applied. • on—The powered device is detected, and power is applied. • power-deny—A powered device is detected, but no PoE is available, or the real-time power consumption exceeds the maximum power allocation. <p>Note The operating mode is the current PoE state for the specified PoE port, the specified stack member, or for all PoE ports on the switch.</p>

Field	Description
Admin Police	Status of the real-time power-consumption policing feature: <ul style="list-style-type: none"> • errdisable—Policing is enabled, and the switch shuts down the port when the real-time power consumption exceeds the maximum power allocation. • log—Policing is enabled, and the switch generates a syslog message when the real-time power consumption exceeds the maximum power allocation. • none—Policing is disabled.
Oper Police	Policing status: <ul style="list-style-type: none"> • errdisable—The real-time power consumption exceeds the maximum power allocation, and the switch shuts down the PoE port. • log—The real-time power consumption exceeds the maximum power allocation, and the switch generates a syslog message. • n/a—Device detection is disabled, power is not applied to the PoE port, or no policing action is configured. • ok—Real-time power consumption is less than the maximum power allocation.
Cutoff Power	The maximum power allocated on the port. When the real-time power consumption is greater than this value, the switch takes the configured policing action.
Oper Power	The real-time power consumption of the powered device.

⁵ The configured power is the power that you manually specify or that the switch specifies by using CDP power negotiation or the IEEE classification, which is different than the real-time power that is monitored with the power sensing feature.

show system mtu

To display the global maximum transmission unit (MTU) or maximum packet size set for the switch, use the **show system mtu** command in privileged EXEC mode.

```
show system mtu
```

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Usage Guidelines For information about the MTU values and the stack configurations that affect the MTU values, see the **system mtu** command.

Examples This is an example of output from the **show system mtu** command:

show tech-support

To automatically run **show** commands that display system information, use the **show tech-support** command in the privilege EXEC mode.

show tech-support

[**cef** | **cft** | **eigrp** | **evc** | **fnf** |] **ipc** | **ipmulticast** | **ipsec** | **mfib** | **nat** | **nbar** | **onep** | **ospf** | **page** | **password** | **rsvp** | **subscriber** | **vrrp** | **wccp** | **wireless**

Syntax Description

cef	(Optional) Displays CEF related information.
cft	(Optional) Displays CFT related information.
eigrp	(Optional) Displays EIGRP related information.
evc	(Optional) Displays EVC related information.
fnf	(Optional) Displays flexible netflow related information.
ipc	(Optional) Displays IPC related information.
ipmulticast	(Optional) Displays IP multicast related information.
ipsec	(Optional) Displays IPSEC related information.
mfib	(Optional) Displays MFIB related information.
nat	(Optional) Displays NAT related information.
onep	(Optional) Displays ONEP related information.
ospf	(Optional) Displays OSPF related information.
page	(Optional) Displays the command output on a single page at a time. Use the Return key to display the next line of output or use the space bar to display the next page of information. If not used, the output scrolls (that is, it does not stop for page breaks). Press the Ctrl-C keys to stop the command output.
password	(Optional) Leaves passwords and other security information in the output. If not used, passwords and other security-sensitive information in the output are replaced with the label "<removed>".
subscriber	(Optional) Displays subscriber related information.
vrrp	(Optional) Displays VRRP related information.
wccp	(Optional) Displays WCCP related information.
wireless	(Optional) Displays wireless related information.

Command Modes

Privileged EXEC (#)

Command History	Release	Modification
		This command was enhanced to display the output of the show logging onboard uptime command
		This command was implemented on the

Usage Guidelines

The output from the **show tech-support** command is very long. To better manage this output, you can redirect the output to a file (for example, **show tech-support > filename**) in the local writable storage file system or the remote file system. Redirecting the output to a file also makes sending the output to your Cisco Technical Assistance Center (TAC) representative easier.

You can use one of the following redirection methods:

- **> filename** - Redirects the output to a file.
- **>> filename** - Redirects the output to a file in append mode.

show wireless interface summary

To display the wireless interface status and configuration, use the **show wireless interface summary** command.

show wireless interface summary

Command Default

None

Command History

Release Modification

This command was introduced.

Usage Guidelines

This example shows how to display the summary of wireless interfaces:

```
# show wireless interface summary
```

speed

To specify the speed of a 10/100/1000/2500/5000 Mbps port, use the **speed** command in interface configuration mode. To return to the default value, use the **no** form of this command.

speed **10** | **100** | **1000** | **2500** | **5000** | **auto** [**10** | **100** | **1000** | **2500** | **5000**] | **nonegotiate**
no speed

Syntax Description	
10	Specifies that the port runs at 10 Mbps.
100	Specifies that the port runs at 100 Mbps.
1000	Specifies that the port runs at 1000 Mbps. This option is valid and visible only on 10/100/1000 Mb/s ports.
2500	Specifies that the port runs at 2500 Mbps. This option is valid and visible only on multi-Gigabit-supported Ethernet ports.
5000	Specifies that the port runs at 5000 Mbps. This option is valid and visible only on multi-Gigabit-supported Ethernet ports.
auto	Detects the speed at which the port should run, automatically, based on the port at the other end of the link. If you use the 10 , 100 , 1000 , 1000 , 2500 , or 5000 keyword with the auto keyword, the port autonegotiates only at the specified speeds.
nonegotiate	Disables autonegotiation, and the port runs at 1000 Mbps.

Command Default The default is **auto**.

Command Modes Interface configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines You cannot configure speed on 10-Gigabit Ethernet ports.

Except for the 1000BASE-T small form-factor pluggable (SFP) modules, you can configure the speed to not negotiate (**nonegotiate**) when an SFP module port is connected to a device that does not support autonegotiation.

The new keywords, **2500** and **5000** are visible only on multi-Gigabit (m-Gig) Ethernet supporting devices.

If the speed is set to **auto**, the switch negotiates with the device at the other end of the link for the speed setting, and then forces the speed setting to the negotiated value. The duplex setting remains configured on each end of the link, which might result in a duplex setting mismatch.

If both ends of the line support autonegotiation, we highly recommend the default autonegotiation settings. If one interface supports autonegotiation and the other end does not, use the auto setting on the supported side, but set the duplex and speed on the other side.



Caution Changing the interface speed and duplex mode configuration might shut down and re-enable the interface during the reconfiguration.

For guidelines on setting the switch speed and duplex parameters, see the “Configuring Interface Characteristics” chapter in the software configuration guide for this release.

Verify your settings using the **show interfaces** privileged EXEC command.

Examples

The following example shows how to set speed on a port to 100 Mbps:

```
(config)# interface gigabitethernet1/0/1
(config-if)# speed 100
```

The following example shows how to set a port to autonegotiate at only 10 Mbps:

```
(config)# interface gigabitethernet1/0/1
(config-if)# speed auto 10
```

The following example shows how to set a port to autonegotiate at only 10 or 100 Mbps:

```
(config)# interface gigabitethernet1/0/1
(config-if)# speed auto 10 100
```

switchport backup interface

To configure Flex Links, use the **switchport backup interface** command in interface configuration mode on a Layer 2 interface on the switch stack or on a standalone switch. To remove the Flex Links configuration, use the **no** form of this command.

```
switchport backup interface interface-id [mmu primary vlan vlan-id | multicast fast-convergence
| preemption delay seconds | mode bandwidth | forced | off | prefer vlan vlan-id]
no switchport backup interface interface-id [mmu primary vlan | multicast fast-convergence |
preemption delay | mode | prefer vlan]
```

Syntax Description		
	<i>interface-id</i>	ID of the physical interface.
	mmu	(Optional) Configures the MAC move update (MMU) for a backup interface pair.
	primary vlan <i>vlan-id</i>	(Optional) VLAN ID of the primary VLAN. The range is 1 to 4094.
	multicast fast-convergence	(Optional) Configures multicast fast convergence on the backup interface.
	preemption	(Optional) Configures a preemption scheme for a backup interface pair.
	delay <i>seconds</i>	Specifies a preemption delay. The range is 1 to 300 seconds. The default is 35 seconds.
	mode	Specifies the preemption mode.
	bandwidth	Specifies that a higher bandwidth interface is preferred.
	forced	Specifies that an active interface is preferred.
	off	Specifies that no preemption occurs from backup to active.
	prefer vlan <i>vlan-id</i>	(Optional) Specifies that VLANs are carried on the backup interfaces of a Flex Link pair. VLAN ID range is 1 to 4094.

Command Default The default is to have no Flex Links defined. The preemption mode is off. No preemption occurs. Preemption delay is set to 35 seconds.

Command Modes Interface configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines Flex Links are a pair of interfaces that provide backup to each other. With Flex Links configured, one link acts as the primary interface and forwards traffic, while the other interface is in standby mode, ready to begin forwarding traffic if the primary link shuts down. The interface being configured is referred to as the active link; the specified interface is identified as the backup link. The feature provides an alternative to the Spanning Tree Protocol (STP), allowing users to turn off STP and still retain basic link redundancy.

This command is available only for Layer 2 interfaces.

You can configure only one Flex Link backup link for any active link, and it must be a different interface from the active interface.

- An interface can belong to only one Flex Link pair. An interface can be a backup link for only one active link. An active link cannot belong to another Flex Link pair.
- A backup link does not have to be the same type (Fast Ethernet or Gigabit Ethernet, for instance) as the active link. However, you should configure both Flex Links with similar characteristics so that there are no loops or changes in behavior if the standby link begins to forward traffic.
- Neither of the links can be a port that belongs to an EtherChannel. However, you can configure two port channels (EtherChannel logical interfaces) as Flex Links, and you can configure a port channel and a physical interface as Flex Links, with either the port channel or the physical interface as the active link.
- If STP is configured on the switch, Flex Links do not participate in STP in all valid VLANs. If STP is not running, be sure that there are no loops in the configured topology.

This example shows how to configure two interfaces as Flex Links:

```
# configure terminal
(conf)# interface gigabitethernet1/0/1
(conf-if)# switchport backup interface gigabitethernet1/0/2
(conf-if)# end
```

This example shows how to configure the Gigabit Ethernet interface to always preempt the backup:

```
# configure terminal
(conf)# interface gigabitethernet1/0/1
(conf-if)# switchport backup interface gigabitethernet1/0/2 preempt forced
(conf-if)# end
```

This example shows how to configure the Gigabit Ethernet interface preemption delay time:

```
# configure terminal
(conf)# interface gigabitethernet1/0/1
(conf-if)# switchport backup interface gigabitethernet1/0/2 preempt delay 150
(conf-if)# end
```

This example shows how to configure the Gigabit Ethernet interface as the MMU primary VLAN:

```
# configure terminal
(conf)# interface gigabitethernet1/0/1
(conf-if)# switchport backup interface gigabitethernet1/0/2 mmu primary vlan 1021
(conf-if)# end
```

You can verify your setting by entering the **show interfaces switchport backup** privileged EXEC command.

switchport block

To prevent unknown multicast or unicast packets from being forwarded, use the **switchport block** command in interface configuration mode. To allow forwarding unknown multicast or unicast packets, use the **no** form of this command.

switchport block multicast | unicast
no switchport block multicast | unicast

Syntax Description

multicast Specifies that unknown multicast traffic should be blocked.

Note Only pure Layer 2 multicast traffic is blocked. Multicast packets that contain IPv4 or IPv6 information in the header are not blocked.

unicast Specifies that unknown unicast traffic should be blocked.

Command Default

Unknown multicast and unicast traffic is not blocked.

Command Modes

Interface configuration

Command History

Release

Modification

This command was introduced.

Usage Guidelines

By default, all traffic with unknown MAC addresses is sent to all ports. You can block unknown multicast or unicast traffic on protected or nonprotected ports. If unknown multicast or unicast traffic is not blocked on a protected port, there could be security issues.

With multicast traffic, the port blocking feature blocks only pure Layer 2 packets. Multicast packets that contain IPv4 or IPv6 information in the header are not blocked.

Blocking unknown multicast or unicast traffic is not automatically enabled on protected ports; you must explicitly configure it.

For more information about blocking packets, see the software configuration guide for this release.

This example shows how to block unknown unicast traffic on an interface:

```
(config-if)# switchport block unicast
```

You can verify your setting by entering the **show interfaces interface-id switchport** privileged EXEC command.

system mtu

Syntax Description *bytes*

Command Default The default MTU size for all ports is 1500 bytes.

Command Modes Global configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines You can verify your setting by entering the **show system mtu** privileged EXEC command.

The switch does not support the MTU on a per-interface basis.

If you enter a value that is outside the allowed range for the specific type of interface, the value is not accepted.

test mcu read-register

To enable debugging of the Power over Ethernet (PoE) controller, use the **test mcu read-register** command in privileged EXEC mode.

test mcu read-register **det-cls-offset** | **manufacture-id** | **port-mode**

Syntax Description	Parameter	Description
	det-cls-offset	Displays the read detection classification register summary.
	manufacture-id	Displays the PoE controller manufacture ID.
	port-mode	Displays the port mode details.

Command Modes Privileged EXEC

Command History	Release	Modification
		This command was introduced.

Examples

The following is sample output from the **test mcu read-register det-cls-offset** command:

```
Device# test mcu read-register det-cls-offset 1
DETECTION ENABLE BIT SUMMARY
```

Controller	port1	port2	port3	port4	register (hexadecimal)
1	1	0	1	0	5
2	1	0	1	0	5
3	1	0	1	0	5
4	1	0	1	0	5
5	1	0	1	0	5
6	1	0	1	0	5
7	1	0	1	0	5
8	1	0	1	0	5
9	1	0	1	0	5
10	1	0	1	0	5
11	0	0	1	0	4
12	1	0	0	0	1

```
CLASSIFICATION ENABLE BIT SUMMARY
```

Controller	port1	port2	port3	port4	register (hexadecimal)
1	1	0	1	0	5
2	1	0	1	0	5
3	1	0	1	0	5
4	1	0	1	0	5
5	1	0	1	0	5
6	1	0	1	0	5
7	1	0	1	0	5
8	1	0	1	0	5
9	1	0	1	0	5
10	1	0	1	0	5
11	0	0	1	0	4
12	1	0	0	0	1

test mcu read-register

1	1	0	1	0	5
2	1	0	1	0	5
3	1	0	1	0	5
4	1	0	1	0	5
5	1	0	1	0	5
6	1	0	1	0	5
7	1	0	1	0	5
8	1	0	1	0	5
9	1	0	1	0	5
10	1	0	1	0	5
11	0	0	1	0	4
12	1	0	0	0	1

The following is sample output from the **test mcu read-register manufacture-id** command:

```
MANUFACTURE ID : DEVICE_BCM_PALPATINE reg_val = 0x1B
```

The following is sample output from the **test mcu read-register port-mode** command:

```
PORT MODE SUMMERY
```

Controller	port1	port2	port3	port4	register (hexadecimal)
1	01	00	01	00	22
2	01	00	01	00	22
3	01	00	01	00	22
4	01	00	01	00	22
5	01	00	01	00	22
6	01	00	01	00	22
7	01	00	01	00	22
8	01	00	01	00	22
9	01	00	01	00	22
10	01	00	01	00	22
11	00	00	01	00	20
12	01	00	00	00	2

voice-signaling vlan (network-policy configuration)

To create a network-policy profile for the voice-signaling application type, use the **voice-signaling vlan** command in network-policy configuration mode. To delete the policy, use the **no** form of this command.

voice-signaling vlan *vlan-id* [**cos** *cos-value* | **dscp** *dscp-value*] | **dot1p** [**cos** *l2-priority* | **dscp** *dscp*] | **none** | **untagged**

Syntax Description	
<i>vlan-id</i>	(Optional) The VLAN for voice traffic. The range is 1 to 4094.
cos <i>cos-value</i>	(Optional) Specifies the Layer 2 priority class of service (CoS) for the configured VLAN. The range is 0 to 7; the default is 5.
dscp <i>dscp-value</i>	(Optional) Specifies the differentiated services code point (DSCP) value for the configured VLAN. The range is 0 to 63; the default is 46.
dot1p	(Optional) Configures the phone to use IEEE 802.1p priority tagging and to use VLAN 0 (the native VLAN).
none	(Optional) Does not instruct the Cisco IP phone about the voice VLAN. The phone uses the configuration from the phone key pad.
untagged	(Optional) Configures the phone to send untagged voice traffic. This is the default for the phone.

Command Default No network-policy profiles for the voice-signaling application type are defined.
 The default CoS value is 5.
 The default DSCP value is 46.
 The default tagging mode is untagged.

Command Modes Network-policy profile configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines Use the **network-policy profile** global configuration command to create a profile and to enter network-policy profile configuration mode.

The voice-signaling application type is for network topologies that require a different policy for voice signaling than for voice media. This application type should not be advertised if all of the same network policies apply as those advertised in the voice policy TLV.

When you are in network-policy profile configuration mode, you can create the profile for voice-signaling by specifying the values for VLAN, class of service (CoS), differentiated services code point (DSCP), and tagging mode.

These profile attributes are contained in the Link Layer Discovery Protocol for Media Endpoint Devices (LLDP-MED) network-policy time-length-value (TLV).

To return to privileged EXEC mode from the network-policy profile configuration mode, enter the **exit** command.

This example shows how to configure voice-signaling for VLAN 200 with a priority 2 CoS:

```
(config) # network-policy profile 1  
(config-network-policy) # voice-signaling vlan 200 cos 2
```

This example shows how to configure voice-signaling for VLAN 400 with a DSCP value of 45:

```
(config) # network-policy profile 1  
(config-network-policy) # voice-signaling vlan 400 dscp 45
```

This example shows how to configure voice-signaling for the native VLAN with priority tagging:

```
(config-network-policy) # voice-signaling vlan dot1p cos 4
```

voice vlan (network-policy configuration)

To create a network-policy profile for the voice application type, use the **voice vlan** command in network-policy configuration mode. To delete the policy, use the **no** form of this command.

```
voice vlan vlan-id [cos cos-value | dscp dscp-value] | dot1p [cos l2-priority | dscp dscp] | none | untagged
```

Syntax Description	
vlan-id	(Optional) The VLAN for voice traffic. The range is 1 to 4094.
cos <i>cos-value</i>	(Optional) Specifies the Layer 2 priority class of service (CoS) for the configured VLAN. The range is 0 to 7; the default is 5.
dscp <i>dscp-value</i>	(Optional) Specifies the differentiated services code point (DSCP) value for the configured VLAN. The range is 0 to 63; the default is 46.
dot1p	(Optional) Configures the phone to use IEEE 802.1p priority tagging and to use VLAN 0 (the native VLAN).
none	(Optional) Does not instruct the Cisco IP phone about the voice VLAN. The phone uses the configuration from the phone key pad.
untagged	(Optional) Configures the phone to send untagged voice traffic. This is the default for the phone.

Command Default No network-policy profiles for the voice application type are defined.
 The default CoS value is 5.
 The default DSCP value is 46.
 The default tagging mode is untagged.

Command Modes Network-policy profile configuration

Command History	Release	Modification
		This command was introduced.

Usage Guidelines Use the **network-policy profile** global configuration command to create a profile and to enter network-policy profile configuration mode.

The voice application type is for dedicated IP telephones and similar devices that support interactive voice services. These devices are typically deployed on a separate VLAN for ease of deployment and enhanced security through isolation from data applications.

When you are in network-policy profile configuration mode, you can create the profile for voice by specifying the values for VLAN, class of service (CoS), differentiated services code point (DSCP), and tagging mode.

These profile attributes are contained in the Link Layer Discovery Protocol for Media Endpoint Devices (LLDP-MED) network-policy time-length-value (TLV).

To return to privileged EXEC mode from the network-policy profile configuration mode, enter the **exit** command.

This example shows how to configure the voice application type for VLAN 100 with a priority 4 CoS:

```
(config) # network-policy profile 1  
(config-network-policy) # voice vlan 100 cos 4
```

This example shows how to configure the voice application type for VLAN 100 with a DSCP value of 34:

```
(config) # network-policy profile 1  
(config-network-policy) # voice vlan 100 dscp 34
```

This example shows how to configure the voice application type for the native VLAN with priority tagging:

```
(config-network-policy) # voice vlan dot1p cos 4
```

wireless ap-manager interface

To configure the wireless AP-manager interface, use the **wireless ap-manager interface** command.

wireless ap-managerinterface TenGigabitEthernet *interface-number* | **Vlan** *interface-number*

Syntax Description	TenGigabitEthernet <i>interface-name</i>	Configures 10-Gigabit Ethernet interface. Values range from 0 to 9.
	Vlan <i>interface-name</i>	Configures VLANs. Values range from 1 to 4095.
Command Default	None	
Command Modes	Global configuration	
Command History	Release Modification	
	This command was introduced.	

This example shows how to configure the wireless AP-manager:

```
# wireless ap-manager interface vlan
<1-4095> Vlan interface number
```

This example shows how to configure the wireless AP-manager:

```
# #wireless ap-manager interface vlan 10
```

wireless exclusionlist

To manage exclusion list entries, use the **wireless exclusionlist** global configuration command. To remove the exclusion list entries, use the **no** form of the command.

```
wireless exclusionlist mac-addr description description
no wireless exclusionlist mac-addr
```

Syntax Description	<i>mac-addr</i>	The MAC address of the local excluded entry.
	description <i>description</i>	Specifies the description for an exclusion-list entry.
Command Default	None	
Command Modes	Global configuration	
Command History	Release	Modification
		This command was introduced.

This example shows how to create a local exclusion list entry for the MAC address xxx.xxx.xxx:

```
# wireless exclusionlist xxx.xxx.xxx
```

This example shows how to create a description for the local exclusion list entry for the MAC address xxx.xxx.xxx:

```
# wireless exclusionlist xxx.xxx.xxx description sample
```

wireless linktest

To configure linktest frame size and number of frames to send, use the **wireless linktest** command.

wireless linktest frame-size *size* | **number-of-frames** *value*

Syntax Description	frame-size <i>size</i>	Specifies the link test frame size for each packet. The values range from 1 to 1400.
	number-of-frames <i>value</i>	Specifies the number of frames to be sent for the link test. The values range from 1 to 100.
Command Default	None	
Command Modes	Global configuration	
Command History	Release Modification	
	This command was introduced.	

This example shows how to configure the link test frame size of each frame as 10:

```
# wireless linktest frame-size 10
```

wireless management interface

To configure wireless management parameters on an interface, use the **wireless management interface** global configuration command. To remove a wireless management parameters on an interface, use the **no** form of the command.

```
wireless management interface interface-name TenGigabitEthernet interface-name | Vlan
interface-name
no wireless management interface
```

Syntax Description	<i>interface-name</i>	The interface number.
	TenGigabitEthernet <i>interface-name</i>	The 10-Gigabit Ethernet interface number. The values range from 0 to 9.
	Vlan <i>interface-name</i>	The VLAN interface number. The values range from 1 to 4095.
Command Default	None	
Command Modes	Global configuration	
Command History	Release	Modification
		This command was introduced.

This example shows how to configure VLAN 10 on the wireless interface:

```
# wireless management interface Vlan 10
```

wireless peer-blocking forward-upstream

To configure peer-to-peer blocking for forward upstream, use the **wireless peer-blocking forward-upstream** command. To remove a peer-to-peer blocking, use the **no** form of the command.

wireless peer-blocking forward-upstream *interface* **GigabitEthernet** *interface-number*

TenGigabitEthernet *interface-number*

no wireless peer-blocking forward-upstream **GigabitEthernet** *interface-number* **TenGigabitEthernet** *interface-number*

Syntax Description	GigabitEthernet <i>interface</i>	The Gigabit Ethernet interface number. Values range from 0 to 9.
	TenGigabitEthernet <i>interface</i>	The 10-Gigabit Ethernet interface number. Values range from 0 to 9.
Command Default	None	
Command Modes	Global configuration	
Command History	Release	Modification
		This command was introduced.

This example shows how to configure peer-to-peer blocking for interface 10-gigabit ethernet interface:

```
(config)# wireless peer-blocking forward-upstream TenGigabitEthernet 1/1/4
```

wireless peer-blocking forward-upstream