Interface and Hardware Commands

bluetooth pin

To configure a new Bluetooth pin, use the **bluetooth pin** command in global configuration mode.

bluetooth pin *pin*

Syntax Description	*pin*	Pairing pin for the Bluetooth interface.
		The pin is a 4-digit number.

Command Modes   Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   The **bluetooth pin** command can be configured either in the global configuration mode. Cisco recommends using the global configuration mode to configure the Bluetooth pin.

Examples   This example shows how to configure a new Bluetooth pin using the **bluetooth pin** command.

```
Device> enable
Device# configure terminal
Device(config)# bluetooth pin 1111
Device(config)#
```

Related Commands	Command	Description
	show platform hardware bluetooth	Displays information about the Bluetooth interface

clear coap database

To clear the CoAP database, use the **clear coap database** command in user EXEC or privileged EXEC mode.

clear coap database

Command Default   This command has no arguments or keywords.

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This example shows how to clear the coap database:

```
Device(config)# clear coap database
```

clear macro auto configuration

To remove the macro applied configuration from the interfaces, use the **clear macro auto configuration** command.

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| **Note** | Before executing the **clear macro auto configuration** command, you must disable Auto SmartPorts on the switch. |

clear macro auto configuration{**all** | **interface** [*interface-id*]}

Syntax Description	*all*	Removes macro applied configuration from all the interfaces.
	interface [*interface-id*]	Removes macro applied configuration from an interface.

Command Default	This command has no default setting.

Command Modes	User EXEC (>)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines	Use the command to remove configuration applied by macros from all the interfaces or a particular interface on the switch.

You can verify your settings by entering the **show macro auto interface** command in privileged EXEC mode.

Example

This example shows how to remove the configuration from all the switch interfaces:

```
Device(config)# clear macro auto configuration all
```

coap endpoint (coap-proxy configuration)

To configure the COAP Proxy to support multiple IPv4/IPv6 static-endpoints, use the **coap endpoint** command in coap-proxy configuration mode. To return to the default settings, use the **no** form of the command.

coap endpoint {**ipv4** | **ipv6**}[*ip-address*]
no coap endpoint {**ipv4** | **ipv6**}[*ip-address*]

Syntax Description		
ipv4 *ip-address*		Specifies IPv4 static endpoint.
ipv6 *ip-address*		Specifies IPv6 static endpoint.

Command Modes   coap-proxy configuration (config-coap-proxy)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This example show how to configure IPv4 static endpoint

```
Device(config)# endpoint ipv4 192.168.255.1
Device(config-coap-proxy)# transport tcp
```

debug coap

To enable debugging of the coap configurations, use the **debug coap** command in privileged EXEC mode.

debug coap {**all** | **database** | **errors** | **events** | **packet** | **trace** | **warnings**}

Syntax Description		
	all	Displays all coap debug messages.
	database	Displays coap database debug messages.
	errors	Displays coap error debug messages.
	events	Displays coap event debug messages.
	packet	Displays coap packet debug messages.
	trace	Displays coap trace debug messages.
	warnings	Displats coap warning debug messages

Command Default This command has no arguments or keywords.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

The example shows how to enable debugging for coap database:

```
Device# debug coap database
```

device classifier

To enable the device classifier, use the **device classifier** command in global configuration mode. Use the **no** form of this command to disable the device classifier.

device classifier

no device classifier

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use the **no device classifier** command, in global configuration mode, to disable the device classifier. You cannot disable the device classifier while it is being used by features such as Auto SmartPorts (ASP).

Example

This example shows how to enable the ASP device classifier on a switch:

```
Device(config)# device classifier
Device(config)# end
```

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

Syntax Description

cdp	Displays PoE Cisco Discovery Protocol (CDP) 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
Cisco IOS XE Fuji 16.9.2	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 stack member, 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 stack member. You also can use the **remote command** *stack-member-number LINE* EXEC command on the active switc 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		
	interface-id	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 *interface-number*	Displays debug messages for null interfaces. The interface number is always **0**.
	port-channel *port-channel-number*	Displays debug messages for the specified EtherChannel port-channel interface. The *port-channel-number* range is 1 to 48.
	vlan *vlan-id*	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
Cisco IOS XE Fuji 16.9.2	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 stack member, 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 stack member. 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 commnd has no arguments or keywords.

Command Default   Debugging is disabled.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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 active switch. To enable debugging on a stack member, you can start a session from the active switch by using the **session** *switch-number* EXEC command.

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 *switch-number*	(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
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

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

debug platform software fed switch active punt packet-capture start

To enable debugging of packets during high CPU utilization, for an active switch, use the **debug platform software fed switch active punt packet-capture start** command in privileged EXEC mode. To disable debugging of packets during high CPU utilization, for an active switch, use the **debug platform software fed switch active punt packet-capture stop** command in privileged EXEC mode.

debug platform software fed switch active punt packet-capture start
debug platform software fed switch active punt packet-capture stop

Syntax Description		
	switch active	Displays information about the active switch.
	punt	Specifies the punt information.
	packet-capture	Specifies information about the captured packet.
	start	Enables debugging of the active switch.
	stop	Disables debugging of the active switch.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The **debug platform software fed switch active punt packet-capture start** command starts the debugging of packets during high CPU utilization. The packet capture is stopped when the 4k buffer size is exceeded.

Examples   The following is a sample output from the **debug platform software fed switch active punt packet-capture start** command:

```
Device# debug platform software fed switch active packet-capture start
Punt packet capturing started.
```

The following is a sample output from the **debug platform software fed switch active punt packet-capture stop** command:

```
Device# debug platform software fed switch active packet-capture stop
Punt packet capturing stopped. Captured 101 packet(s)
```

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 Mb/s). You cannot configure half-duplex mode for interfaces operating at 1000 Mb/s, 10,000 Mb/s, 2.5Gb/s, or 5Gb/s.

Command Default

The default is **auto** for Gigabit Ethernet ports.

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.

Command Modes

Interface configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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.

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**.

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Caution   Changing the interface speed and duplex mode configuration might shut down and re-enable 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(config)# interface gigabitethernet1/0/1
Devic(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
Cisco IOS XE Fuji 16.9.2	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:

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

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

```
Device(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:

```
Device(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 (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   A cause (such as all or BDPU 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:

```
Device# Device#configure terminal
Device(config)# errdisable recovery cause bpduguard
```

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 (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   A cause (such as all or BDPU 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:

```
Device# Device#configure terminal
Device(config)# errdisable recovery cause bpduguard
```

interface

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

interface {**AccessTunnel** *interface-number* | **Auto-Template** *interface-number* | **GigabitEthernet** *switch-number/slot-number/port-number* | **Internal Interface** *Internal Interface number* | **LISP** *interface-number* **Loopback** *interface-number* **Null** *interface-number* **Port-channel** *interface-number* **TenGigabitEthernet** *switch-number/slot-number/port-number* **TwentyFiveGigE** *switch-number/slot-number/port-number* **Tunnel** *interface-number* **Vlan** *interface-number* }

Syntax Description

AccessTunnel *interface-number*	Enables you to configure an access tunnel interface.
Auto-Template *interface-number*	Enables you to configure a auto-template interface. The range is from 1 to 999.
GigabitEthernet *switch-number/slot-number/port-number*	Enables you to configure a Gigabit Ethernet IEEE 802.3z interface. • *switch-number* — Switch ID. The range is from 1 to 8. • *slot-number* — Slot number. The range is from 0 to 1. • *port-number* — Port number. The range is from 1 to 48.
LISP *interface-number*	Enables you to configure a LISP interface.
Loopback *interface-number*	Enables you to configure a loopback interface. The range is from 0 to 2147483647.
Null *interface-number*	Enables you to configure a null interface. The default value is 0.
Port-channel *interface-number*	Enables you to configure a port-channel interface. The range is from 1 to 128.
TenGigabitEthernet *switch-number/slot-number/port-number*	Enables you to configure a 10-Gigabit Ethernet interface. • *switch-number* — Switch ID. The range is from 1 to 8. • *slot-number* — Slot number. The range is from 0 to 1. • *port-number* — Port number. The ranges are 1 to 4, 17 to 24, and 37 to 48.

TwentyFiveGigE *switch-number/slot-number/port-number*	Enables you to configure a 25-Gigabit Ethernet interface.
	• *switch-number* — Switch ID. The range is from 1 to 8.
	• *slot-number* — Slot number. Value is 1.
	• *port-number* — Port number. The range is from 1 to 2.
Tunnel *interface-number*	Enables you to configure a tunnel interface. The range is from 0 to 2147483647.
Vlan *interface-number*	Enables you to configure a switch VLAN. The range is from 1 to 4094.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.
Cisco IOS XE Gibraltar 16.11.1	The **TwentyFiveGigE** keyword was added to the command.

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

The range for uplink ports is 0-4.

The range for multi-Gigabit Ethernet ports on 24-port switches is 17-24.

The range for multi-Gigabit Ethernet ports on 48-port switches is 41-48.

Examples   The following example shows how to configure a tunnel interface:

```
Device(config)# interface Tunnel 15
Device(config-if)#
```

The following example shows how to configure a 25-Gigabit Ethernet interface

```
Device(config)# interface TwentyFiveGigE 1/1/1
Device(config-if)#
```

The following example shows how to configure a 40-Gigabit Ethernet interface

interface range

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

interface range { **GigabitEthernet** *switch-number/slot-number/port-number* | **Loopback** *interface-number* **Null** *interface-number* **Port-channel** *interface-number* **TenGigabitEthernet** *switch-number/slot-number/port-number* **TwentyFiveGigE** *switch-number/slot-number/port-number* **Tunnel** *interface-number* **Vlan** *interface-number* }

Syntax Description		
GigabitEthernet *switch-number/slot-number/port-number*	Enables you to configure a Gigabit Ethernet IEEE 802.3z interface. • *switch-number* — Switch ID. The range is from 1 to 8. • *slot-number* — Slot number. The range is from 0 to 1. • *port-number* — Port number. The range is from 0 to 48.
Loopback *interface-number*	Enables you to configure a loopback interface. The range is from 0 to 2147483647.
Port-channel *interface-number*	Enables you to configure a port-channel interface. The range is from 1 to 48.
TenGigabitEthernet *switch-number/slot-number/port-number*	Enables you to configure a 10-Gigabit Ethernet interface. • *switch-number* — Switch ID. The range is from 1 to 8. • *slot-number* — Slot number. The range is from 0 to 1. • *port-number* — Port number. The ranges are 1 to 4, 17 to 24, and 37 to 48.
TwentyFiveGigE *switch-number/slot-number/port-number*	Enables you to configure a 25-Gigabit Ethernet interface. • *switch-number* — Switch ID. The range is from 1 to 8. • *slot-number* — Slot number. Value is 1. • *port-number* — Port number. The range is from 1 to 2.
Tunnel *interface-number*	Enables you to configure a tunnel interface. The range is from 0 to 2147483647.

Vlan *interface-number*	Enables you to configure a switch VLAN. The range is from 1 to 4094.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.
Cisco IOS XE Gibraltar 16.11.1	The **TwentyFiveGigE** keyword was added to the command.

Usage Guidelines   The range for uplink ports is 0-4.

The range for multi-Gigabit Ethernet ports on 24-port switches is 17-24.

The range for multi-Gigabit Ethernet ports on 48-port switches is 41-48.

Examples   This example shows how you can configure interface range:

```
Device(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	*bytes*	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 (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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:

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

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

```
Device(config)# interface vlan 200
Device(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.

```
Device# 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	*bytes*	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

Release	Modification
Cisco IOS XE Fuji 16.9.2	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:

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

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

```
Device(config)# interface gigabitethernet4/0/1
Device(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.

```
Device# 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>
```

list (coap-proxy configuration)

To restrict the IP address range where the lights and their resources can be learnt, use the **list** command in coap-proxy configuration mode. To return to the default settings, use the **no** form of the command.

A maximum of five ip-lists can be configured, irrespective of ipv4 or ipv6, using the **list** command.

list {**ipv4** | **ipv6**}[*list-name*]
no list {**ipv4** | **ipv6**}[*list-name*]

Syntax Description	**ipv4** *list-name*	Specifies IPv4 list name.
	ipv6 *list-name*	Specifies IPv6 list name.

Command Modes   coap-proxy configuration (config-coap-proxy)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to restrict the IPv4 address range using a list name.

```
Device(config)# coap proxy
Device config-coap-proxy)# list ipv4 trial_list
```

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.

lldp {**med-tlv-select** *tlv* | **receive** | **tlv-select** **power-management** | **transmit**}
no lldp {**med-tlv-select** *tlv* | **receive** | **tlv-select** **power-management** | **transmit**}

Syntax Description		
	med-tlv-select	Selects an LLDP Media Endpoint Discovery (MED) time-length-value (TLV) element to send.
	tlv	String that identifies the TLV element. Valid values are the following: • **inventory-management**— LLDP MED Inventory Management TLV. • **location**— LLDP MED Location TLV. • **network-policy**— LLDP MED Network Policy TLV. • **power-management**— LLDP MED Power Management 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 (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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:

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

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

```
Device(config)# interface gigabitethernet1/0/1
```

```
Device(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 (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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:

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

macro

To apply a macro to an interface or to apply and debug a macro on an interface, use the **macro** command in interface configuration mode.

macro {**apply** | **trace**}*macro-name* [**parameter** {*value*}][**parameter** {*value*}][**parameter** {*value*}]

Syntax Description		
	apply	Applies a macro to an interface.
	trace	Applies a macro to an interface and then debugs it.
	macro-name	Specifies the name of the macro.
	parameter *value*	(Optional) Specifies unique parameter values that are specific to the interface. You can enter up to three keyword-value pairs. Parameter keyword matching is case sensitive.
		All matching occurrences of the keyword are replaced with the corresponding value.

Command Default   This command has no default setting.

Command Modes   Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   You can use the **macro apply** *macro-name* command to apply and show the macros running on an interface.

You can use the **macro trace** *macro-name* command to apply and then debug the macro to find any syntax or configuration errors.

If a command fails because of a syntax error or a configuration error when you apply a macro, the macro continues to apply the remaining commands to the interface.

When creating a macro that requires the assignment of unique values, use the **parameter** *value* keywords to designate values specific to the interface.

Keyword matching is case sensitive. All matching occurrences of the keyword are replaced with the corresponding value. Any full match of a keyword, even if it is part of a larger string, is considered a match and is replaced by the corresponding value.

Some macros might contain keywords that require a parameter value. You can use the **macro apply** *macro-name* ? command to display a list of any required values in the macro. If you apply a macro without entering the keyword values, the commands are invalid and are not applied.

There are Cisco-default SmartPorts macros embedded in the switch software. You can display these macros and the commands that they contain by using the **show parser macro** command in user EXEC mode.

Follow these guidelines when you apply a Cisco-default SmartPorts macro on an interface:

- Display all macros on the switch by using the **show parser macro** command in user EXEC mode. Display the contents of a specific macro by using the **show parser macro** *macro-name* command in user EXEC mode.

- Keywords that begin with $ mean that a unique parameter value is required. Append the Cisco-default macro with the required values by using the **parameter** *value* keywords.

The Cisco-default macros use the $ character to identify required keywords. You can use the $ character to define keywords when you create a macro.

When you apply a macro to an interface, the macro name is automatically added to the interface. You can display the applied commands and macro names by using the **show running-config interface** *interface-id* command in user EXEC mode.

A macro applied to an interface range behaves the same way as a macro applied to a single interface. When you use an interface range, the macro is applied sequentially to each interface within the range. If a macro command fails on one interface, it is still applied to the remaining interfaces.

You can delete a macro-applied configuration on an interface by entering the **default interface** *interface-id* command in interface configuration mode.

Example

After you use the **macro name** command, in interface configuration mode, you can apply it to an interface. This example shows how to apply a user-created macro called duplex to an interface:

```
Device(config-if)# macro apply duplex
```

To debug a macro, use the **macro trace** command, in interface configuration mode, to find any syntax or configuration errors in the macro as it is applied to an interface.

```
Device(config-if)# macro trace duplex
Applying command...'duplex auto'
%Error Unknown error.
Applying command...'speed nonegotiate'
```

This example shows how to display the Cisco-default cisco-desktop macro and how to apply the macro and set the access VLAN ID to 25 on an interface:

```
Device# show parser macro cisco-desktop
--------------------------------------------------------------
Macro name : cisco-desktop
Macro type : default
# Basic interface - Enable data VLAN only
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access
# Enable port security limiting port to a single
# MAC address -- that of desktop
switchport port-security
switchport port-security maximum 1
# Ensure port-security age is greater than one minute
# and use inactivity timer
switchport port-security violation restrict
switchport port-security aging time 2
switchport port-security aging type inactivity
# Configure port as an edge network port
spanning-tree portfast
```

```
spanning-tree bpduguard enable
-------------------------------------------------------------
Device#
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# interface gigabitethernet1/0/4
Device(config-if)# macro apply cisco-desktop $AVID 25
```

macro auto

To configure and apply a global macro using the CLI, use the **macro auto** command in privileged EXEC mode.

Use the **no** form of this command to return to the default setting.

macro auto {**apply** | **config**} *macro-name*

Syntax Description	apply	Applies the macro.
	config	Enters the macro parameters.
	macro-name	Specifies the macro name.

Command Default   No macros are applied to the switch.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   To remove the macro from the switch, enter the **no** forms of the macro commands.

If you enter the **macro auto config** *macro-name* command, you are prompted to enter values for all the macro parameters.

Use the exact text string when entering the macro-name. The entries are case sensitive.

The user-defined values appear only in the **show macro auto** or **show running-config** command output.

Example

This example shows how to display global macros:

```
Device# macro auto apply ?
CISCO_SWITCH_AAA_ACCOUNTING          Configure aaa accounting parameters
CISCO_SWITCH_AAA_AUTHENTICATION      Configure aaa authentication parameters
CISCO_SWITCH_AAA_AUTHORIZATION       Configure aaa authorization parameters
CISCO_SWITCH_AUTO_IP_CONFIG          Configure the ip parameters
CISCO_SWITCH_AUTO_PCI_CONFIG         Configure PCI compliant parameters
CISCO_SWITCH_DOMAIN_NAME_CONFIG      Configure domain name
CISCO_SWITCH_ETHERCHANNEL_CONFIG     Configure the etherchannel parameters
CISCO_SWITCH_HOSTNAME_CONFIG         Configure hostname
CISCO_SWITCH_HTTP_SERVER_CONFIG      Configure http server
CISCO_SWITCH_LOGGING_SERVER_CONFIG   Configure logging server
CISCO_SWITCH_MGMT_VLAN_CONFIG        Configure management vlan parameters
CISCO_SWITCH_NAME_SERVER_CONFIG      Configure name server parameters
CISCO_SWITCH_NTP_SERVER_CONFIG       Configure NTP server
CISCO_SWITCH_RADIUS_SERVER_CONFIG    Configure radius server
CISCO_SWITCH_SETUP_SNMP_TRAPS        Configure SNMP trap parameters
CISCO_SWITCH_SETUP_USR_CONFIG        Configure the user parameters
CISCO_SWITCH_SNMP_SOURCE_CONFIG      Configure snmp source interface
```

```
CISCO_SWITCH_TACACS_SERVER_CONFIG    Configure tacacs server
CISCO_SWITCH_USER_PASS_CONFIG        Configure username and password

Device# macro auto config ?
CISCO_SWITCH_AAA_ACCOUNTING          Configure aaa accounting parameters
CISCO_SWITCH_AAA_AUTHENTICATION      Configure aaa authentication parameters
CISCO_SWITCH_AAA_AUTHORIZATION       Configure aaa authorization parameters
CISCO_SWITCH_AUTO_IP_CONFIG          Configure the ip parameters
CISCO_SWITCH_AUTO_PCI_CONFIG         Configure PCI compliant parameters
CISCO_SWITCH_DOMAIN_NAME_CONFIG      Configure domain name
CISCO_SWITCH_ETHERCHANNEL_CONFIG     Configure the etherchannel parameters
CISCO_SWITCH_HOSTNAME_CONFIG         Configure hostname
CISCO_SWITCH_HTTP_SERVER_CONFIG      Configure http server
CISCO_SWITCH_LOGGING_SERVER_CONFIG   Configure logging server
CISCO_SWITCH_MGMT_VLAN_CONFIG        Configure management vlan parameters
CISCO_SWITCH_NAME_SERVER_CONFIG      Configure name server parameters
CISCO_SWITCH_NTP_SERVER_CONFIG       Configure NTP server
CISCO_SWITCH_RADIUS_SERVER_CONFIG    Configure radius server
CISCO_SWITCH_SETUP_SNMP_TRAPS        Configure SNMP trap parameters
CISCO_SWITCH_SETUP_USR_CONFIG        Configure the user parameters
CISCO_SWITCH_SNMP_SOURCE_CONFIG      Configure snmp source interface
CISCO_SWITCH_TACACS_SERVER_CONFIG    Configure tacacs server
CISCO_SWITCH_USER_PASS_CONFIG        Configure username and password
```

This example shows how to display the parameters for a specific macro:

```
Device# macro auto config CISCO_SWITCH_AUTO_IP_CONFIG ?
CISCO_SWITCH_DOMAIN_NAME_CONFIG      domain name parameters
CISCO_SWITCH_LOGGING_SERVER_CONFIG   logging host parameters
CISCO_SWITCH_NAME_SERVER_CONFIG      name server parameters
CISCO_SWITCH_NTP_SERVER_CONFIG       ntp server parameters
LINE                                 Provide parameters of form [Parameters
                                     name=value]
<cr>


Device# macro auto config CISCO_SWITCH_AUTO_PCI_CONFIG ?
CISCO_SWITCH_AAA_ACCOUNTING          aaa accounting parameters
CISCO_SWITCH_AAA_AUTHENTICATION      aaa authentication parameters
CISCO_SWITCH_AAA_AUTHORIZATION       aaa authorization parameters
CISCO_SWITCH_HTTP_SERVER_CONFIG      http server parameters
CISCO_SWITCH_RADIUS_SERVER_CONFIG    radius server parameters
CISCO_SWITCH_TACACS_SERVER_CONFIG    tacacs server parameters
LINE                                 Provide parameters of form [Parameters
                                     name=value]
<cr>


Device# macro auto config CISCO_SWITCH_SETUP_SNMP_TRAPS ?
CISCO_SWITCH_SNMP_SOURCE_CONFIG      snmp source parameters
LINE                                 Provide parameters of form [Parameters
                                     name=value]
<cr>


Device# macro auto config CISCO_SWITCH_SETUP_USR_CONFIG ?CISCO_AUTO_TIMEZONE_CONFIG timezone
 parameters
CISCO_SWITCH_HOSTNAME_CONFIG         hostname parameter
LINE                                 Provide parameters of form [Parameters
                                     name=value]
<cr>
```

This example shows how to set macro parameters and apply the macro using the CLI:

```
Device# macro auto config CISCO_SWITCH_ETHERCHANNEL_CONFIG
Enter the port channel id[1-48] for 3K & 2350,[1-6] for 2K: 2
Enter the port channel type, Layer:[2-3(L3 not supported on 2K)]: 2
Enter etherchannel mode for the interface[auto/desirable/on/active/passive]: active
Enter the channel protocol[lacp/none]: lacp
Enter the number of interfaces to join the etherchannel[8-PAGP/MODE:ON,16-LACP]: 7
Enter interface name[GigabitEthernet3/0/3]: gigabitethernet1/0/1
Enter interface name[GigabitEthernet3/0/3]: gigabitethernet1/0/2
Enter interface name[GigabitEthernet3/0/3]: gigabitethernet1/0/3
Enter interface name[GigabitEthernet3/0/3]: gigabitethernet1/0/4
Enter interface name[GigabitEthernet3/0/3]: gigabitethernet1/0/5
Enter interface name[GigabitEthernet3/0/3]: gigabitethernet1/0/6
Enter interface name[GigabitEthernet3/0/3]: gigabitethernet1/0/7
Do you want to apply the parameters? [yes/no]: yes
Enter configuration commands, one per line. End with CNTL/Z.
Enter configuration commands, one per line. End with CNTL/Z.
Enter configuration commands, one per line. End with CNTL/Z.
Enter configuration commands, one per line. End with CNTL/Z.
Enter configuration commands, one per line. End with CNTL/Z.
Enter configuration commands, one per line. End with CNTL/Z.
Enter configuration commands, one per line. End with CNTL/Z.
Device# macro auto apply CISCO_SWITCH_ETHERCHANNEL_CONFIG
Enter configuration commands, one per line. End with CNTL/Z.
Device#
```

macro auto apply (Cisco IOS shell scripting capability)

To configure and apply a global macro using the Cisco IOS shell scripting capability, use the **macro auto apply** command in privileged EXEC mode. Use the **no** form of this command to return to the default setting.

macro auto apply *macro-name*

Syntax Description		
apply		Applies the macro.
macro-name		Specifies the macro name.

Command Default No macros are applied to the switch.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines To remove the macro from the switch, enter the **no** forms of the macro commands.

Use the exact text string when entering the *macro-name*. The entries are case sensitive.

The user-defined values appear only in the **show macro auto** or **show running-config** command output.

You can also use the Cisco IOS shell scripting capability to set the parameters. For examples, see the

"Configuring and Applying Global Macros" section in the "Configuring Auto Smartports and Static Smartports Macros" chapter.

Example

This example shows how to display global macros:

```
Device# macro auto apply ?

CISCO_SWITCH_AAA_ACCOUNTING         Configure aaa accounting parameters
CISCO_SWITCH_AAA_AUTHENTICATION     Configure aaa authentication parameters
CISCO_SWITCH_AAA_AUTHORIZATION      Configure aaa authorization parameters
CISCO_SWITCH_AUTO_IP_CONFIG         Configure the ip parameters
CISCO_SWITCH_AUTO_PCI_CONFIG        Configure PCI compliant parameters
CISCO_SWITCH_DOMAIN_NAME_CONFIG     Configure domain name
CISCO_SWITCH_ETHERCHANNEL_CONFIG    Configure the etherchannel parameters
CISCO_SWITCH_HOSTNAME_CONFIG        Configure hostname
CISCO_SWITCH_HTTP_SERVER_CONFIG     Configure http server
CISCO_SWITCH_LOGGING_SERVER_CONFIG  Configure logging server
CISCO_SWITCH_MGMT_VLAN_CONFIG       Configure management vlan parameters
CISCO_SWITCH_NAME_SERVER_CONFIG     Configure name server parameters
CISCO_SWITCH_NTP_SERVER_CONFIG      Configure NTP server
CISCO_SWITCH_RADIUS_SERVER_CONFIG   Configure radius server
CISCO_SWITCH_SETUP_SNMP_TRAPS       Configure SNMP trap parameters
CISCO_SWITCH_SETUP_USR_CONFIG       Configure the user parameters
CISCO_SWITCH_SNMP_SOURCE_CONFIG     Configure snmp source interface
```

macro auto apply (Cisco IOS shell scripting capability)

```
CISCO_SWITCH_TACACS_SERVER_CONFIG    Configure tacacs server
CISCO_SWITCH_USER_PASS_CONFIG        Configure username and password
```

macro auto config (Cisco IOS shell scripting capability)

To configure and apply a global macro, use the **macro auto config** command in privileged EXEC mode. Use the **no** form of this command to return to the default setting.

macro auto config *macro-name* [*parameter=value* [*parameter=value*]**...**]

Syntax Description	config	Enters the macro parameters.
	macro-name	Specifies the macro name.
	parameter=value [parameter=value] ...	*parameter=value*—Replaces values for global macro parameter values. Enter values in the form of name value pair separated by a space: <name1>=<value1> [<name2>=<value2>...]

Command Default   No macros are applied to the switch.

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   To remove the macro from the switch, enter the **no** forms of the macro commands.

If you enter the **macro auto config** *macro-name* command, you are prompted to enter values for all the macro parameters.

Use the exact text string when entering the *macro-name* and *parameters*. The entries are case sensitive.

The user-defined values appear only in the **show macro auto** or **show running-config** command output.

You can also use the Cisco IOS shell scripting capability to set the parameters. For examples, see the "Configuring and Applying Global Macros" section in the "Configuring Auto Smartports and Static Smartports Macros" chapter.

macro auto control

To specify when the switch applies an Auto Smartports macro based on the detection method, device type, or trigger (referred to as event trigger control), use the **macro auto control** command in interface configuration mode. Use the **no** form of this command to disable trigger-to-macro mapping. The switch then does not apply macros based on event triggers.

macro auto control {**detection** [cdp] [**lldp**] [**mac-address**] | **device** [ip-camera] [**media-player**] [**phone**] [**lightweight-ap**] [**access-point**] [**router**] [**switch**] | **trigger** [**last-resort**]}
no macro auto control {**detection** [cdp] [**lldp**] [**mac-address**] | **device** [ip-camera] [**media-player**] [**phone**] [**lightweight-ap**] [**access-point**] [**router**] [**switch**] | **trigger** [**last-resort**]}

Syntax Description		
detection [cdp] [lldp] [mac-address]		detection—Sets one or more of these as an event trigger:
		• (Optional) **cdp**—CDP messages
		• (Optional) **lldp**—LLDP messages
		• (Optional) **mac-address**—User-defined MAC address groups
device [access-point] [ip-camera] [lightweight-ap] [media-player] [phone] [router] [switch]		device—Sets one or more of these devices as an event trigger:
		• (Optional) **access-point**—Autonomous access point
		• (Optional) **ip-camera**—Cisco IP video surveillance camera
		• (Optional) **lightweight-ap**—Lightweight access point
		• (Optional) **media-player**—Digital media player
		• (Optional) **phone**—Cisco IP phone
		• (Optional) **router**—Cisco router
		• (Optional) **switch**—Cisco switch
trigger [last-resort]		trigger—Sets a specific event trigger.
		• (Optional) **last-resort**—Last-resort trigger.

Command Default	The switch uses the device type as the event trigger. If the switch cannot determine the device type, it uses MAC address groups, MAB messages, 802.1x authentication messages, and LLDP messages in random order.

Command Modes	Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

If you do not set event triggers, the switch uses the device type as the event trigger. If the switch cannot determine the device type, it uses MAC address groups, MAB messages, 802.1x authentication messages, and LLDP messages in random order.

To verify that a macro is applied to an interface, use the **show macro auto interface** command in user EXEC mode.

Example

This example shows how to set LLDP messages and MAC address groups as event triggers:

```
Device(config)# interface gigabitethernet 5/0/2
Device(config-if)# macro auto control detection lldp mac-address
Device(config-if)# exit
Device(config)# end
```

This example shows how to set access points, video surveillance cameras, and digital media players as event triggers:

> **Note** The switch applies a built-in macro only when it detects an access point, video surveillance camera, or digital media player.

```
Device(config)# interface gigabitethernet 5/0/1
Device(config-if)# macro auto control device access-point ip-camera media-player
Device(config-if)# exit
Device(config)# end
```

macro auto execute

To replace built-in macro default values and to configure mapping from an event trigger to a built-in or user-defined macro, use the **macro auto execute** command in global configuration mode.

macro auto execute *event trigger* {**builtin** *built-in macro* | **remote** *url*} {*parameter=value*} {*function contents*}
no macro auto execute *event trigger* {**builtin** *built-in macro* | **remote** *url*} {*parameter=value*} {*function contents*}

Syntax Description		
event trigger	Defines mapping from an event trigger to a built-in macro. Specifies an event trigger:	

Specifies an event trigger:

- CISCO_CUSTOM_EVENT
- CISCO_DMP_EVENT
- CISCO_IPVSC_EVENT
- CISCO_LAST_RESORT_EVENT
- CISCO_PHONE_EVENT
- CISCO_ROUTER_EVENT
- CISCO_SWITCH_EVENT
- CISCO_WIRELESS_AP_EVENT
- CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT
- WORD—Apply a user-defined event trigger such as a MAC address group

builtin *built-in macro name*	(Optional) Specifies a builtin built-in macro name: • CISCO_AP_AUTO_SMARTPORT Specify the parameter value: NATIVE_VLAN=1 • CISCO_DMP_AUTO_SMARTPORT Specify the parameter value: ACCESS_VLAN=1. • CISCO_IPVSC_AUTO_SMARTPORT Specify the parameter value: ACCESS_VLAN=1. • CISCO_LWAP_AUTO_SMARTPORT Specify the parameter value: ACCESS_VLAN=1. • CISCO_PHONE_AUTO_SMARTPORT Specify the parameter values: ACCESS_VLAN=1 and VOICE_VLAN=2. • CISCO_ROUTER_AUTO_SMARTPORT Specify the parameter value: NATIVE_VLAN=1. • CISCO_SWITCH_AUTO_SMARTPORT Specify the parameter value: NATIVE_VLAN=1.
parameter=value	(Optional) *parameter=value*—Replaces default values for parameter values shown for the *bultin-macro name*, for example, ACCESS_VLAN=1. Enter new values in the form of name value pair separated by a space: [<name1>=<value1> <name2>=<value2>...].
{function contents}	(Optional) *{function contents}*— Specifies a user-defined macro to associate with the trigger. Enter the macro contents within braces. Begin the Cisco IOS shell commands with the left brace and end the command grouping with the right brace.

remote *url*	(Optional) Specifies a remote server location:
	• The syntax for the local flash file system on the standalone switch or the stack's active switch: **flash**:
	The syntax for the local flash file system on a stack member:
	flash *member number*:
	The syntax for the FTP:
	ftp:[[//*username*[:*password*]@*location*]/*directory*]/*filename*
	The syntax for an HTTP server:
	http://[[*username*:*password*]@]{*hostname*	*host-ip*}[/*directory*]/*filename*
	The syntax for a secure HTTP server:
	https://[[*username*:*password*]@]{*hostname*	*host-ip*}[/*directory*]/*filename*
	The syntax for the NVRAM:
	nvram://[[*username*:*password*]@][/*directory*]/*filename*
	The syntax for the Remote Copy Protocol (RCP):
	rcp:[[//*username*@*location*]/*directory*]/*filename*
	The syntax for the Secure Copy Protocol (SCP):
	scp:[[//*username*@*location*]/*directory*]/*filename*
	The syntax for the TFTP:
	tftp:[[//*location*]/*directory*]/*filename*

Command Default	None
Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use the **macro auto execute** command to replace the built-in macro default values with values that are specific to your switch.

The switch automatically maps from event triggers to built-in macros. The built-in macros are system-defined macros in the software image. You can also create user-defined macros by using the Cisco IOS shell scripting capability.

You can create new event triggers by using the **shell trigger** commands in global configuration mode. Use the **show shell triggers** command in privileged EXEC to display the contents of the user-defined triggers and macros.

You can use the **macro auto mac-address-group** command in global configuration mode to create event triggers for devices that do not support Cisco Discovery Protocol (CDP) or Link Layer Discovery Protocol (LLDP).

You can use the remote macro feature to store macros in a central location for designated network switches to use. You can then maintain and update the macro files for use by multiple switches. Use **remote** *url* to configure the remote server location and macro path information. There are no specific file extension requirements for saved macro files.

Auto Smartports macros and antimacros (the antimacro is the portion of the applied macro that removes it at link down) have these guidelines and limitations:

- You can delete or change the built-in macros. However, you can override a built-in macro by creating a user-defined macro with the same name. To restore the original built-in macro, delete the user-defined macro.

- If you enable both the **macro auto device** and the **macro auto execute** commands, the parameters specified in the command last executed are applied to the switch. Only one command is active on the switch.

- To avoid system conflicts when macros are applied, remove all port configurations except for 802.1x authentication.

- Do not configure port security when enabling Auto SmartPorts on the switch.

- If the macro conflicts with the original configuration, either the macro does not apply some of the original configuration commands, or the antimacro does not remove them. (The antimacro is the portion of the applied macro that removes the macro at a link-down event.)

- For example, if 802.1x authentication is enabled, you cannot remove the switchport-mode access configuration. Remove the 802.1x authentication before removing the switchport mode configuration.

- A port cannot be a member of an EtherChannel when you apply Auto SmartPorts macros.

- The built-in-macro default data VLAN is VLAN 1. The default voice VLAN is VLAN 2. If your switch uses different access, native, or voice VLANs, use the **macro auto device** or the **macro auto execute** commands to configure the values.

- For 802.1x authentication or MAC authentication bypass (MAB), to detect non-Cisco devices, configure the RADIUS server to support the Cisco attribute-value pair **auto-smart-port=***event trigger*

- The switch supports Auto SmartPort macros only on directly connected devices. Multiple device connections, such as hubs, are not supported.

- If authentication is enabled on a port, the switch ignores a MAC address trigger if authentication fails.

- The order of CLI commands within the macro and the corresponding antimacro can be different.

.

Example

This example shows how to use two built-in macros for connecting Cisco switches and Cisco IP phones to the switch. This example modifies the default voice VLAN, access VLAN, and native VLAN for the trunk interface:

```
Device(config)# !!! the next command modifies the access and voice vlans
Device(config)# !!! for the built in Cisco IP phone auto smartport macro
Device(config)# macro auto execute CISCO_PHONE_EVENT builtin CISCO_PHONE_AUTO_SMARTPORT
ACCESS_VLAN=10 VOICE_VLAN=20
Device(config)# !!! the next command modifies the Native vlan used for inter switch trunks
```

```
Device(config)# macro auto execute CISCO_SWITCH_EVENT builtin CISCO_SWITCH_AUTO_SMARTPORT
NATIVE_VLAN=10
Device(config)# !!! the next command enables auto smart ports globally
Device(config)# macro auto global processing
Device(config)# exit
Device# !!! here is the running configuration of the interface connected
Device# !!! to another Cisco Switch after the Macro is applied
Device# show running-config interface gigabitethernet1/0/1
Building configuration...

Current configuration : 284 bytes
!
interface GigabitEthernet1/0/1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 10
 switchport mode trunk
 srr-queue bandwidth share 10 10 60 20
 queue-set 2
 priority-queue out
 mls qos trust cos
 auto qos voip trust
 macro description CISCO_SWITCH_EVENT
end
```

This example shows how to map a user-defined event trigger called media player to a user-defined macro

1. Connect the media player to an 802.1x- or MAB-enabled switch port.

2. On the RADIUS server, set the attribute-value pair to auto-smart-port=DMP_EVENT

3. On the switch, create the event trigger DMP_EVENT, and enter the user-defined macro commands.

4. The switch recognizes the attribute-value pair=DMP_EVENT response from the RADIUS server and applies the macro associated with this event trigger.

```
Device(config)# shell trigger DMP_EVENT mediaplayer
Device(config)# macro auto execute DMP_EVENT {
if [[ $LINKUP == YES ]]; then
conf t
 interface $INTERFACE
   macro description $TRIGGER
   switchport access vlan 1
   switchport mode access
   switchport port-security
   switchport port-security maximum 1
   switchport port-security violation restrict
   switchport port-security aging time 2
   switchport port-security aging type inactivity
   spanning-tree portfast
   spanning-tree bpduguard enable
   exit
fi
if [[ $LINKUP == NO ]]; then
conf t
interface $INTERFACE
    no macro description $TRIGGER
    no switchport access vlan 1
    if [[ $AUTH_ENABLED == NO ]]; then
       no switchport mode access
    fi
```

```
        no switchport port-security
        no switchport port-security maximum 1
        no switchport port-security violation restrict
        no switchport port-security aging time 2
        no switchport port-security aging type inactivity
        no spanning-tree portfast
        no spanning-tree bpduguard enable
        exit
fi
```

Table 1: Supported Cisco IOS Shell Keywords

Command	Description
{	Begin the command grouping.
}	End the command grouping.
[[	Use as a conditional construct.
]]	Use as a conditional construct.
else	Use as a conditional construct.
==	Use as a conditional construct.
fi	Use as a conditional construct.
if	Use as a conditional construct.
then	Use as a conditional construct.
-z	Use as a conditional construct.
$	Variables that begin with the $ character are replaced with a parameter value.
#	Use the # character to enter comment text.

Table 2: Unsupported Cisco IOS Shell Reserved Keywords

Command	Description
|	Pipeline.
case	Conditional construct.
esac	Conditional construct.
for	Looping construct.
function	Shell function.
in	Conditional construct.
select	Conditional construct.

Command	Description
time	Pipeline.
until	Looping construct.
while	Looping construct.

macro auto global control

To specify when the switch applies an Auto Smartports macro based on the device type or trigger (referred to as event trigger control), use the **macro auto global control** command in global configuration mode. Use the **no** form of this command to disable trigger-to-macro mapping.

macro auto global control {**detection** [**cdp**] [**lldp**][**mac-address**] | **device** [**access-point**] [**ip-camera**] [**lightweight-ap**] [**media-player**] [**phone**] [**router**] [**switch**] | **trigger** [**last-resort**]}
no macro auto global control {**detection** [**cdp**] [**lldp**] [**mac-address**] | **device** [**access-point**] [**ip-camera**] [**lightweight-ap**] [**media-player**] [**phone**] [**router**] [**switch**] | **trigger** [**last-resort**]}

Syntax Description		
detection [cdp] [lldp] [mac-address]	detection—Sets one or more of these as an event trigger:	
	• (Optional) **cdp**—CDP messages	
	• (Optional) **lldp**—LLDP messages	
	• (Optional) **mac-address**—User-defined MAC address groups	
device [access-point] [ip-camera] [lightweight-ap] [media-player] [phone] [router] [switch]	device—Sets one or more of these devices as an event trigger:	
	• (Optional) **access-point**—Autonomous access point	
	• (Optional) **ip-camera**—Cisco IP video surveillance camera	
	• (Optional) **lightweight-ap**—Lightweight access point	
	• (Optional) **media-player**—Digital media player	
	• (Optional) **phone**—Cisco IP phone	
	• (Optional) **router**—Cisco router	
	• (Optional) **switch**—Cisco switch	
trigger [last-resort]	trigger—Sets a specific event trigger.	
	• (Optional) **last-resort**—Last-resort trigger.	

Command Default The switch uses the device type as the event trigger. If the switch cannot determine the device type, it uses MAC address groups, MAB messages, 802.1x authentication messages, and LLDP messages in random order.

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

If you do not set event triggers, the switch uses the device type as the event trigger. If the switch cannot determine the device type, it uses MAC address groups, MAB messages, 802.1x authentication messages, and LLDP messages in random order.

To verify that a macro is applied to a switch, use the **show macro auto global** command in user EXEC mode.

Example

This example shows how to set CDP messages, LLDP messages and MAC address groups as event triggers:

```
Device(config)# macro auto global control detection cdp lldp mac-address
Device(config)# end
```

This example shows how to set autonomous access points, lightweight access points, and IP phones:

```
Device(config)# macro auto global control device access-point lightweight-ap phone
Device(config)# end
```

macro auto global processing

To enable Auto SmartPorts macros on the switch, use the **macro auto global processing** command in global configuration mode. Use the **no** form of this command to disable the macros.

macro auto global processing

no macro auto global processing

Command Default Auto Smartports is disabled.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines Use the **macro auto global processing** command to globally enable macros on the switch. To disable macros on a specific port, use the **no macro auto processing** command in interface mode.

When using 802.1x or MAB authentication, you need to configure the RADIUS server to support the Cisco attribute-value pair **auto-smart-port**=*event trigger*. If authentication fails, the macro is not applied. If the 802.1x or MAB authentication fails on the interface, the switch does not use the fallback CDP event trigger.

When CDP-identified devices advertise multiple capabilities, the switch chooses a capability first by switch and then by router.

To verify that a macro is applied to an interface, use the **show macro auto interface**command in privileged EXEC mode.

Example

This example shows how to enable Auto SmartPorts on the switch and to disable the feature on a specific interface:

```
Device(config)# macro auto global processing
Device(config)# interface gigabitethernet 0/1
Device(config-if)# no macro auto processing
Device(config-if)# exit
Device(config)#
```

macro auto mac-address-group

To create an event trigger for devices that do not support Cisco Discovery Protocol (CDP) or Link Layer Discover Protocol (LLDP), use the **macro auto mac-address-group** command in global configuration mode. Use the **no** form of this command to delete the group.

macro auto mac-address-group *name* {**mac-address list** *list* | **oui** {**list** *list* | **range** *start-value* **size** *number*}}
no macro auto mac-address-group *name* {**mac-address list** *list* | **oui** {**list** *list* | **range** *start-value* **size** *number*}}

Syntax Description	*name*	Specifies the group name.
	ui	(Optional) Specifies an operationally unique identifier (OUI) **list** or **range**.
		• **list**—Enter an OUI list in hexadecimal format separated by spaces.
		• **range**—Enter the starting OUI hexadecimal value (*start-value*).
		• **size**—Enter the length of the range (number) from 1 to 5 to create a list of sequential addresses.
	mac-address list *list*	(Optional) Configures a list of MAC addresses separated by a space.

Command Default	No groups are defined.

Command Modes	Group configuration (config-addr-grp-mac)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use the **macro auto mac-address-group** command to create an event trigger for devices that do not support CDP or LLDP. Use the MAC address group as a trigger to map to a built-in or user-defined macro by using the **macro auto execute** command. At link-up the switch detects the device type and applies the specified macro.

The switch supports up to ten MAC address groups. Each group can have up to 32 OUI and 32 MAC configured addresses.

Example

This example shows how to create a MAC-address-group event trigger called *address_trigger* and how to verify your entries:

```
Device(config)# macro auto mac-address-group mac address_trigger
Device(config-addr-grp-mac)# mac-address list 2222.3333.3334 22.33.44 a.b.c
Device(config-addr-grp-mac)# oui list 455555 233244
```

```
Device(config-addr-grp-mac)# oui range 333333 size 2
Device(config-addr-grp-mac)# exit
Device(config)# end
Device# show running configuration
!
!macro auto mac-address-group address_trigger
 oui list 333334
 oui list 333333
 oui list 233244
 oui list 455555
 mac-address list 000A.000B.000C
 mac-address list 0022.0033.0044
 mac-address list 2222.3333.3334
!

<output truncated>
```

macro auto processing

To enable Auto SmartPorts macros on an interface, use the **macro auto processing** command in interface configuration mode. Use the no form of this command to disable the macros.

macro auto processing

no macro auto processing

Command Default   Auto SmartPorts is disabled.

Command Modes   Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   Use the **macro auto processing** command, in interface configuration mode, to enable macros on a specific interface. To disable macros on a specific interface, use the no macro auto processing command, in interface configuration mode.

A port cannot be a member of an EtherChannel when you apply Auto SmartPorts macros. If you use EtherChannels, disable Auto SmartPorts on the EtherChannel interface by using the **no macro auto processing** command. The EtherChannel interface applies the configuration to the member interfaces.

To verify that a macro is applied to an interface, use the **show macro auto interface** command in privileged EXEC mode.

Example

This example shows how to enable Auto SmartPorts on the switch and to disable the feature on a specific interface:

```
Device(config)# interface gigabitethernet 0/1
Device(config-if)# no macro auto processing
Device(config-if)# exit
Device(config)# macro auto global processing
```

macro auto sticky

To configure macros to remain active after a link-down event, referred to as macro persistence, use the **macro auto sticky** command in global configuration mode. Use the **no** form of this command to disable the macro persistence.

macro auto sticky
no macro auto sticky

Command Default Macro persistence is disabled.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines Use the **macro auto sticky** command so that macros remain active after a link-down event.

Example

This example shows how to enable macro persistence on an interface:

```
Device(config)# interface gigabitethernet 5/0/2
Device(config-if)# macro auto port sticky
Device(config-if)# exit
Device(config)# end
```

macro auto trigger

To enter the configure-macro-trigger mode and define a trigger for a device that has no built-in trigger and associate the trigger with a device or profile, use the **macro auto trigger** command in global configuration mode. To remove the user-defined trigger, use the **no** form of this command.

macro auto trigger *trigger_name* {**device** | **exit** | **no** | **profile**}
no macro auto trigger *trigger_name* {**device** | **exit** | **no** | **profile**}

Syntax Description		
trigger_name	Specifies a trigger to be associated with the device type or profile name.
device	Specifies a device name to map to the named trigger.
exit	Exits device group configuration mode.
no	Removes any configured device.
profile	Specifies a profile name to map to the named trigger.

Command Default No user-defined triggers are configured.

Command Modes Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines If a device is classified by the Device Classifier, but does not have a built-in trigger defined, use the **macro auto trigger** command, in global configuration mode, to define a trigger based on a device name or a profile name. After you enter the command, the switch is in the configure-macro-trigger mode and the **device**, **exit**, **no**, and **profile** keywords are visible. In this mode, you can provide a device name or a profile name to map to the trigger. It is not necessary to map the trigger to both a device name and a profile name. If you map the trigger to both names, the trigger-to-profile name mapping has preference for macro application.

You must use this command to configure a trigger when you configure a user-defined macro. The trigger name is required for the custom macro configuration.

After the device is profiled, you must add the complete string to the device-group database.

Example

This example shows how to configure a user-defined trigger for a profile called DMP_EVENT mediaplayer for use with a media player that has no built-in trigger:

```
Device(config)# macro auto trigger DMP
Device(config-macro-trigger)# profile mediaplayer-DMP
Device(config-macro-trigger)# exit
```

macro description

To enter a description about which macros are applied to an interface, use the **macro description** command in interface configuration mode. Use the **no** form of this command to remove the description. This command is mandatory for Auto SmartPorts to work.

macro description *text*
no macro description *text*

Syntax Description	**description** *text*	Enters a description about the macros that are applied to the specified interface.

Command Default This command has no default setting.

Command Modes Interface configuration (config-if)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines Use the **description** keyword to associate comment text or the macro name with an interface. When multiple macros are applied on a single interface, the description text is from the last applied macro.

You can verify your settings by entering the **show parser macro description** command in privileged EXEC mode.

Example

This example shows how to add a description to an interface:

```
Device(config-if)# macro description duplex settings
```

macro global

To apply a macro to a switch or to apply and debug a macro on a switch, use the **macro global** command in global configuration mode.

macro global {**apply** | **trace**} *macro-name* [**parameter** {*value*}][**parameter** {*value*}][**parameter** {*value*}] parameter

Syntax Description		
apply	Applies a macro to the switch.
trace	Applies a macro to a switch and debugs the macro.
macro-name	Specifies the name of the macro.
parameter *value*	(Optional) Specifies unique parameter values that are specific to the switch. You can enter up to three keyword-value pairs. Parameter keyword matching is case sensitive. All matching occurrences of the keyword are replaced with the corresponding value.

Command Default This command has no default setting.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Note You can delete a global macro-applied configuration on a switch only by entering the no version of each command in the macro.

Use the **macro global apply** *macro-name* command to apply the macro to an interface.

Use the **macro global trace** *macro-name* command to apply and then debug the macro to find any syntax or configuration errors.

If a command fails when you apply a macro because of a syntax error or a configuration error, the macro continues to apply the remaining commands to the switch.

When creating a macro that requires the assignment of unique values, use the **parameter** *value* keywords to designate values specific to the switch.

Keyword matching is case sensitive. All matching occurrences of the keyword are replaced with the corresponding value. Any full match of a keyword, even if it is part of a larger string, is considered a match and is replaced by the corresponding value.

Some macros might contain keywords that require a parameter value. You can use the **macro global apply** *macro-name* ? command to display a list of any required values in the macro. If you apply a macro without entering the keyword values, the commands are invalid and are not applied.

There are Cisco-default Smartports macros embedded in the switch software. You can display these macros and the commands they contain by using the **show parser macro** command in user EXEC mode.

Follow these guidelines when you apply a Cisco-default Smartports macro on a switch:

- Display all macros on the switch by using the **show parser macro** command. Display the contents of a specific macro by using the **show parser macro name** *macro-name* command.

- Keywords that begin with $ mean that a unique parameter value is required. Append the Cisco-default macro with the required values by using the **parameter** *value* keywords.

  The Cisco-default macros use the $ character to help identify required keywords. There is no restriction on using the $ character to define keywords when you create a macro.

When you apply a macro to a switch, the macro name is automatically added to the switch. You can display the applied commands and macro names by using the **show running-config** command.

Example

After you have created a new macro by using the **macro auto execute** command, you can apply it to a switch. This example shows how to view the **snmp** macro, how to apply the macro, set the hostname to test-server, and set the IP precedence value to 7:

```
Device# show parser macro name snmp
Macro name : snmp
Macro type : customizable

#enable port security, linkup, and linkdown traps
snmp-server enable traps port-security
snmp-server enable traps linkup
snmp-server enable traps linkdown
#set snmp-server host
snmp-server host ADDRESS
#set SNMP trap notifications precedence
snmp-server ip precedence VALUE

--------------------------------------------------
Device(config)# macro global apply snmp ADDRESS test-server VALUE 7
```

To debug a macro, use the **macro global trace** command to find any syntax or configuration errors in the macro when you apply it to a switch. In this example, the **ADDRESS** parameter value was not entered, the **snmp-server host** command failed, and the remainder of the macro is applied to the switch:

```
Device(config)# macro global trace snmp VALUE 7
Applying command...'snmp-server enable traps port-security'
Applying command...'snmp-server enable traps linkup'
Applying command...'snmp-server enable traps linkdown'
Applying command...'snmp-server host'
%Error Unknown error.
Applying command...'snmp-server ip precedence 7'
```

macro global description

To enter a description about the macros that are applied to a switch, use the **macro global description** command in global configuration mode. Use the **no** form of this command to remove the description.

macro global description *text*

no macro global description *text*

Syntax Description	**description** *text*	Enters a description about the macros that are applied to the switch.

Command Default   This command has no default setting.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   Use the **description** keyword to associate comment text or the macro name with a switch. When multiple macros are applied on a switch, the description text is from the last applied macro.

You can verify your settings by entering the **show parser macro description** command in privileged EXEC mode.

Example

This example shows how to add a description to a switch:

```
Device(config)# macro global description udld aggressive mode enabled
```

max-endpoints (coap-proxy configuration)

To specify the maximum number of endpoints that can be learnt on the device, use the **max-endpoints** command in coap-proxy configuration mode. To return to the default settings, use the **no** form of the command.

max-endpoints *number*
no max-endpoints

Syntax Description	*number*	Range is from 1 to 500

Command Default The default number of endpoints is 10.

Command Modes coap-proxy configuration (config-coap-proxy)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to specify maximum endpoints as 12 that can be learnt on the device.

```
Device(config)# coap proxy
Device(config-coap-proxy)# max-endpoints 12
```

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 (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

When auto-MDIX is enabled, the interface automatically detects the required cable connection type (straight-through or crossover) and configures the connection appropriately.

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.

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.

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.

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.

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

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

monitoring

To enable monitoring of all optical transceivers and to specify the time period for monitoring the transceivers, use the **monitoring** command in transceiver type configuration mode. To disable the monitoring, use the **no** form of this command.

monitoring [**interval** *seconds*]
no monitoring [**interval**]

Syntax Description

interval *seconds*	(Optional) Specifies the time interval for monitoring optical transceivers.
	The range is from 300 to 3600 seconds, and the default interval time is 600 seconds.

Command Default

The interval time is 600 seconds.

Command Modes

Transceiver type configuration (config-xcvr-type)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

You need digital optical monitoring (DOM) feature and transceiver module compatibility information to configure the **monitoring** command. Refer to the compatibility matrix to get the lists of Cisco platforms and minimum required software versions to support Gigabit Ethernet transceiver modules.

Gigabit Ethernet Transceivers transmit and receive Ethernet frames at a rate of a gigabit per second, as defined by the IEEE 802.3-2008 standard. Cisco's Gigabit Ethernet Transceiver modules support Ethernet applications across all Cisco switching and routing platforms. These pluggable transceivers offer a convenient and cost effective solution for the adoption in data center, campus, metropolitan area access and ring networks, and storage area networks.

The **interval** keyword enables you to change the default polling interval. For example, if you set the interval as 1500 seconds, polling happens at every 1500th second. During the polling period entSensorStatus of optical transceivers is set to *Unavailable*, and once the polling finishes entSensorStatus shows the actual status.

Examples

This example shows how to enable monitoring of optical transceivers and set the interval time for monitoring to 1500 seconds:

```
Device# configure terminal
Device(config)# transceiver type all
Device(config-xcvr-type)# monitoring interval 1500
```

This example shows how to disable monitoring for all transceiver types:

```
Device(config-xcvr-type)# no monitoring
```

Related Commands

Command	Description
transceiver type all	Enables monitoring on all transceivers.

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 (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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:

```
Device(config)# interface gigabitethernet1/0/1
Device(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	*profile-number* Network-policy profile number. The range is 1 to 4294967295.

Command Default No network-policy profiles are defined.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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:

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

port-dtls (coap-proxy configuration)

To configure a Datagram Transport Layer Security (DTLS) port, use the **port-dtls** command in coap-proxy configuration mode. To return to the default settings, use the **no** form of the command.

port-dtls *number*
no port-dtls

Syntax Description		
	number	Range is from 1 to 65000.

Command Default The default port is 5683.

Command Modes coap-proxy configuration (config-coap-proxy)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to configure a dtls port .

```
Device(config)# coap proxy
Device(config-coap-proxy)# port-dtls 5899
```

port-unsecure (coap-proxy configuration)

To configure a port, use the **port-unsecure** command in coap-proxy configuration mode. To return to the default settings, use the **no** form of the command.

port-unsecure *number*
no port-dtls

Syntax Description	*number*	Range is from 1 to 65000.

Command Default The default port is 5683.

Command Modes coap-proxy configuration (config-coap-proxy)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to configure a port .

```
Device(config)# coap proxy
Device(config-coap-proxy)# port-unsecure 5899
```

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 *max-wattage*		(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 (config-if)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	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:

```
Device(config)# interface gigabitethernet1/0/1
Device(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:

```
Device(config)# interface gigabitethernet1/0/2
Device(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:

```
Device(config)# interface gigabitethernet1/0/2
Device(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:

```
Device(config)# interface gigabitethernet1/0/2
Device(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:

```
Device(config)# interface gigabitethernet1/0/2
Device(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 device 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 device 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 (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   This command is supported only on Power over Ethernet (PoE)-capable ports. If you enter this command on a device or 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 device takes action when a powered device consumes more power than the allocated maximum amount.

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

When power policing is enabled, the device 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 device automatically sets the power usage of the device by using CDP power negotiation or by the IEEE classification and LLPD power negotiation.

If you do not manually configure the cutoff-power value, the device 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 device 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 *Imax* limitation and might experience

an *Icut* 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 device 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 device is locked to CDP, it does not provide power to devices that send LLDP requests. If CDP is disabled after the device has locked on it, the device 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 device 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 device either turns power off to the port, or the device generates a syslog message and updates the LEDs (the port LEDs are blinking amber) while still providing power to the device.

- To configure the device 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 device 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 device.

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 device to generate a syslog message on the PoE port on a device:

```
Device(config)# interface gigabitethernet1/0/2
Device(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	

stack-member-number	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
Cisco IOS XE Fuji 16.9.2	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:

```
Device> 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
Device
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:

```
Device> 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:

```
Device> 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
```

resource directory (coap-proxy configuration)

To unicast upstream resource directory server to which the switch can act as a COAP client, use the **resource directory** command in coap-proxy configuration mode. To return to the default settings, use the **no** form of the command.

A maximum of five ip-lists can be configured, for each ipv4 or ipv6, using the resource directory command.

resource directory {**ipv4** | **ipv6**}[*ip-address*]
no resource directory

Syntax Description	**ipv4** *ip-address*	Specifies IPv4 address.
	ipv6 *ip-address*	Specifies IPv6 address.

Command Modes   coap-proxy configuration (config-coap-proxy)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to unicast upstream resource directory server to which the switch can act as a COAP client.

```
Device(config)# coap proxy
Device(config-coap-proxy)# resource-directory ipv4 192.168.1.1
```

security (coap-proxy configuration)

To configure CoAP security features, use the **security** command in coap-proxy configuration mode. To return to the default settings, use the **no** form of the command.

security {**none** [{**ipv4** { *ip-address ip-mask/prefix*} | **ipv6**{ *ip-address ip-mask/prefix*} | **list**{*ipv4-list-name ipv6-list-name*}}] | **dtls** {[**id-trustpoint** {*identity-trustpoint label*}][**verification-trustpoint** { *verification-trustpoint*}] | [{**ipv4** { *ip-address ip-mask/prefix*} | **ipv6**{ *ip-address ip-mask/prefix*} | **list**{*ipv4-list-name ipv6-list-name*}}]}}
no security

Syntax Description		
none	Indicates no security on that port.	
	Note	A maximum of five ipv4 and five ipv6 addresses can be associated.
dtls	The DTLS security takes RSA trustpoint and Verification trustpoint which are optional. Without 1.1.0.0 255.255.0.0 Verification trustpoint it does the normal Public Key Exchange.	
	Note	A maximum of five ipv4 and five ipv6 addresses can be associated.

Command Modes   coap-proxy configuration (config-coap-proxy)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to configure no security on the port.

```
Device(config)# coap proxy
Device(config-coap-proxy)# security none ipv4 1.1.0.0 255.255.0.0
```

shell trigger

To create an event trigger, use the **shell trigger** command in global configuration mode. Use the **no** form of this command to delete the trigger.

shell trigger *identifier description*

no shell trigger *identifier description*

Syntax Description	*identifier*	Specifies the event trigger identifier. The identifier should have no spaces or hyphens between words.
	description	Specifies the event trigger description text.

Command Default

System-defined event triggers:

- CISCO_DMP_EVENT
- CISCO_IPVSC_AUTO_EVENT
- CISCO_PHONE_EVENT
- CISCO_SWITCH_EVENT
- CISCO_ROUTER_EVENT
- CISCO_WIRELESS_AP_EVENT
- CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use this command to create user-defined event triggers for use with the **macro auto device** and the **macro auto execute** commands.

To support dynamic device discovery when using IEEE 802.1x authentication, you need to configure the RADIUS authentication server to support the Cisco attribute-value pair: **auto-smart-port**=*event trigger*.

Example

This example shows how to create a user-defined event trigger called RADIUS_MAB_EVENT:

```
Device(config)# shell trigger RADIUS_MAB_EVENT MAC_AuthBypass Event
Device(config)# end
```

show beacon all

To display the status of beacon LED on the device, use the **show beacon all** command in privileged EXEC mode.

show beacon {**rp** {**active** | **standby**} | **slot** *slot-number* } | **all**}

Syntax Description		
rp {**active**	**standby**}		Specifies the active or the standby Switch whose beacon LED status is to be displayed.
slot *slot-num*		Specifies the slot whose beacon LED status is to be displayed.
all		Displays the status of all beacon LEDs.

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Command Default This command has no default settings.

Command Modes Privileged EXEC (#)

Usage Guidelines Use the command **show beacon all** to know the status of all beacon LEDs.

Sample output of *show beacon all* command.

```
Device#show beacon all
Switch#   Beacon Status
----------------------
*1        OFF
```

Sample output of *show beacon rp* command.

```
Device#show beacon rp active
Switch#   Beacon Status
----------------------
*1        OFF


Device#show beacon slot 1
Switch#   Beacon Status
----------------------
*1        OFF
```

show coap dtls endpoints

To display the CoAP dtls endpoints, use the **show coap dtls endpoints** command in user EXEC or privileged EXEC mode.

show coap dtls endpoints

Command Default

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This example shows how to display the CoAP dtls endpoint:

```
Device# show coap dtls endpoints
#     Index StateString StateValue  Port IP
--------------------------------------------------------------
```

show coap endpoints

To display the CoAP endpoints, use the **show coap endpoints** command in user EXEC or privileged EXEC mode.

show coap endpoints

Command Default

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This example shows how to display the CoAP endpoint

```
Device# show coap endpoints
List of all endpoints :

Code : D - Discovered , N - New
#    Status  Age(s)    LastWKC(s)    IP
-------------------------------------------------------------

Endpoints - Total : 0 Discovered : 0 New : 0
```

show coap globals

To display the CoAP globals, use the **show coap globals** command in user EXEC or privileged EXEC mode.

show coap globals

Command Default

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

The following is sample output from the **show coap globals** command:

This example shows how to display the CoAP configuration:

```
Device# show coap dtls globals
Coap System Timer Values :
 Discovery  : 120 sec
 Cache Exp  : 5 sec
 Keep Alive : 120 sec
 Client DB  : 5 sec
 Query Queue: 500 ms
 Ack delay  : 500 ms
 Timeout    : 5 sec
 Ageout     : 300 sec

Max Endpoints       : 10

Max DTLS Endpoints : 20
Resource Disc Mode : POST
```

show coap resources

To display the CoAP resources, use the **show coap resources** command in user EXEC or privileged EXEC mode.

show coap resources

Command Default

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This example shows how to display the CoAP resources:

```
Device# show coap resources
Link format data =

</>
</cisco/flood>
</cisco/context>
</cisco/showtech>
</cisco/discover>
</cisco/sleep>
</cisco/lldp>
```

show coap stats

To display the CoAP stats, use the **show coap stats** command in user EXEC or privileged EXEC mode.

show coap stats

Command Default

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This example shows how to display the CoAP stats:

```
Device# show coap stats
Coap Stats :
Endpoints    : 0
Requests     : 20
Ext Queries  : 0
New Endpoints: 0
```

show coap version

To display the CoAP version, use the **show coap version** command in user EXEC or privileged EXEC mode.

show coap version

Command Default

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This example shows how to display the CoAP version:

```
Device# show coap version
CoAP version 1.0.5
RFC 7252
```

show device classifier attached

To display the devices connected to a switch and their associated properties, use the **show device classifier attached** command in user EXEC mode.

show device classifier attached [{**detail** | **interface** *interface_id* | **mac-address** *mac_address*}]

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

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   Use this command to display the devices connected to a switch. Use the **show device classifier attached** command in privileged EXEC mode to display the configurable parameters for a device.

Example

This example shows how to use the **show device classifier attached** command with no optional keywords to view the devices connected to the switch:

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

This example shows how to use the **show device classifier attached** command in privileged EXEC mode with the optional **mac-address** keyword to view summary information about the connected device with the specified MAC address:

```
Device# show device classifier attached mac-address 001f.9e90.1250
MAC_Address      Port_Id     Profile Name
==============   =======     ===========================
001f.9e90.1250   Gi1/0/4    Cisco-AP-Aironet-1130
======================================================
```

This example shows how to use the **show device classifier attached** command in privileged EXEC mode with the optional **mac-address** and **detail** keywords to view detailed information about the connected device with the specified MAC address:

```
Device# show device classifier attached mac-address 001f.9e90.1250 detail
MAC_Address       Port_Id      Certainty Parent    ProfileType     Profile Name
     Device_Name
==============    =======      ========= ======    ===========     ============================
     ===========
001f.9e90.1250    Gi1/0/4      40        2         Built-in        Cisco-AP-Aironet-1130
    cisco AIR-LAP1131AG-E-K9
==================================================================================================
```

This example shows how to use the **show device classifier attached** command in privileged EXEC mode with the optional **interface** keyword to view summary information about the device connected to the specified interface:

```
Device# show device classifier attached interface gi 1/0/2
MAC_Address       Port_Id         Profile Name
==============    =======      ============================
000a.b8c6.1e07    Gi1/0/2      Cisco-Device
=====================================================
```

This example shows how to use the **show device classifier attached** command in privileged EXEC mode with the optional **interface** and **detail** keywords to view detailed information about the device connected to the specified interface:

```
Device# show device classifier attached interface gi 1/0/2 detail
MAC_Address       Port_Id      Certainty Parent    ProfileType  Profile Name
     Device_Name
==============    =======      ========= ======    ===========  ============================
     ===========
000a.b8c6.1e07    Gi1/0/2      10        0         Default      Cisco-Device        cisco
WS-C2960-48TT-L
==================================================================================================
```

show device classifier clients

To display the clients using the device classifier facility on the switch, use the **show device classifier clients** command in user EXEC mode.

show device classifier clients

Command Default

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

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

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

Example

This example shows how to use the **show device classifier clients** command to view the clients using the DC on the switch:

```
Device# show device classifier clients
Client Name
===================
Auto Smart Ports

This example shows the error message that appears when you attempt to disable DC while a
client is using it:
Switch(config)# no device classifier
These subsystems should be disabled before disabling Device classifier
Auto Smart Ports

% Error - device classifier is not disabled
```

show device classifier profile type

To display all the device types recognized by the device classifier, use the **show device classifier profile type** command in user EXEC mode.

show device classifier profile type [{**table** [{*built-in default*}] | **string** *filter_string*}]

Syntax Description		
	table	Displays device classification in a table.
	built-in	Displays device classification information from the built-in device table.
	default	Displays device classification information from the default device table.
	filter *string*	Displays information for devices that match the filter.

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   This command displays all the device types recognized by the device classification engine. The number of available device types is the number of profiles stored on the switch. Because the number of profiles can be very large, you can use the **filter** keyword to limit the command output.

Example

This example shows how to use the **show device classifier profile type** command in privileged EXEC mode with no optional keywords to view the devices recognized by the device classifier:

```
Device# show device classifier profile type table
  Valid        Type      Profile Name                    min Conf   ID
=========== ========= ==================                ======== ====
  Valid       Default    Apple-Device                        10        0
  Valid       Default    Aruba-Device                        10        1
  Valid       Default    Avaya-Device                        10        2
  Valid       Default    Avaya-IP-Phone                      20        3
  Valid       Default    BlackBerry                          20        4
  Valid       Default    Cisco-Device                        10        5
  Valid       Default    Cisco-IP-Phone                      20        6
  Valid       Default    Cisco-IP-Phone-7902                 70        7
  Valid       Default    Cisco-IP-Phone-7905                 70        8
  Valid       Default    Cisco-IP-Phone-7906                 70        9
  Valid       Default    Cisco-IP-Phone-7910                 70       10
  Valid       Default    Cisco-IP-Phone-7911                 70       11
  Valid       Default    Cisco-IP-Phone-7912                 70       12
  Valid       Default    Cisco-IP-Phone-7940                 70       13
  Valid       Default    Cisco-IP-Phone-7941                 70       14
  Valid       Default    Cisco-IP-Phone-7942                 70       15
```

```
Valid       Default      Cisco-IP-Phone-7945                 70      16
Valid       Default      Cisco-IP-Phone-7945G                70      17
Valid       Default      Cisco-IP-Phone-7960                 70      18
Valid       Default      Cisco-IP-Phone-7961                 70      19
Valid       Default      Cisco-IP-Phone-7962                 70      20
Valid       Default      Cisco-IP-Phone-7965                 70      21
Valid       Default      Cisco-IP-Phone-7970                 70      22
Valid       Default      Cisco-IP-Phone-7971                 70      23
Valid       Default      Cisco-IP-Phone-7975                 70      24
Valid       Default      Cisco-IP-Phone-7985                 70      25
Valid       Default      Cisco-IP-Phone-9971                 70      26
Valid       Default      Cisco-WLC-2100-Series               40      27
Valid       Default      DLink-Device                        10      28
Valid       Default      Enterasys-Device                    10      29
Valid       Default      HP-Device                           10      30
Valid       Default      HP-JetDirect-Printer                30      31
Valid       Default      Lexmark-Device                      10      32
Valid       Default      Lexmark-Printer-E260dn              30      33
Valid       Default      Microsoft-Device                    10      34
Valid       Default      Netgear-Device                      10      35
Valid       Default      NintendoWII                         10      36
Valid       Default      Nortel-Device                       10      37
Valid       Default      Nortel-IP-Phone-2000-Series         20      38
Valid       Default      SonyPS3                             10      39
Valid       Default      XBOX360                             20      40
Valid       Default      Xerox-Device                        10      41
Valid       Default      Xerox-Printer-Phaser3250            30      42
Valid       Default      Aruba-AP                            20      43
Valid       Default      Cisco-Access-Point                  10      44
Valid       Default      Cisco-IP-Conference-Station-7935    70      45
Valid       Default      Cisco-IP-Conference-Station-7936    70      46
Valid       Default      Cisco-IP-Conference-Station-7937    70      47
Valid       Default      DLink-DAP-1522                      20      48
Valid       Default      Cisco-AP-Aironet-1130               30      49
Valid       Default      Cisco-AP-Aironet-1240               30      50
Valid       Default      Cisco-AP-Aironet-1250               30      51
Valid       Default      Cisco-AIR-LAP                       25      52
Valid       Default      Cisco-AIR-LAP-1130                  30      53
Valid       Default      Cisco-AIR-LAP-1240                  50      54
Valid       Default      Cisco-AIR-LAP-1250                  50      55
Valid       Default      Cisco-AIR-AP                        25      56
Valid       Default      Cisco-AIR-AP-1130                   30      57
Valid       Default      Cisco-AIR-AP-1240                   50      58
Valid       Default      Cisco-AIR-AP-1250                   50      59
Invalid     Default      Sun-Workstation                     10      60
Valid       Default      Linksys-Device                      20      61
Valid       Default      LinksysWAP54G-Device                30      62
Valid       Default      HTC-Device                          10      63
Valid       Default      MotorolaMobile-Device               10      64
Valid       Default      VMWare-Device                       10      65
Valid       Default      ISE-Appliance                       10      66
Valid       Built-in     Cisco-Device                        10      0
Valid       Built-in     Cisco-Router                        10      1
Valid       Built-in     Router                              10      2
Valid       Built-in     Cisco-IP-Camera                     10      3
Valid       Built-in     Cisco-IP-Camera-2xxx                30      4
Valid       Built-in     Cisco-IP-Camera-2421                50      5
Valid       Built-in     Cisco-IP-Camera-2500                50      6
Valid       Built-in     Cisco-IP-Camera-2520                50      7
Valid       Built-in     Cisco-IP-Camera-2530                50      8
Valid       Built-in     Cisco-IP-Camera-4xxx                50      9
Valid       Built-in     Cisco-Transparent-Bridge            8       10
Valid       Built-in     Transparent-Bridge                  8       11
Valid       Built-in     Cisco-Source-Bridge                 10      12
```

```
Valid      Built-in    Cisco-Switch                      10        13
Valid      Built-in    Cisco-IP-Phone                    20        14
Valid      Built-in    IP-Phone                          20        15
Valid      Built-in    Cisco-DMP                         10        16
Valid      Built-in    Cisco-DMP-4305G                   70        17
Valid      Built-in    Cisco-DMP-4310G                   70        18
Valid      Built-in    Cisco-DMP-4400G                   70        19
Valid      Built-in    Cisco-WLC-2100-Series             40        20
Valid      Built-in    Cisco-Access-Point                10        21
Valid      Built-in    Cisco-AIR-LAP                     30        22
Valid      Built-in    Cisco-AIR-AP                      30        23
Valid      Built-in    Linksys-Device                    20        24
```

show environment

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

show environment { **all** | **fan** | **power** | **stack** | **temperature** }

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.
	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.

Command Default	None

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

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines Use the **show environment** EXEC command to display the information for the switch being accessed—a standalone switch or the active switch. Use this command with the **stack** keyword to display all information for the stack or for the specified stack member.

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

You can also use the **show environment 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*.

Examples This example shows a sample output of the **show environment all** command:

```
Device> show environment all

Switch 1 FAN 1 is OK
Switch 1 FAN 2 is OK
Switch 1 FAN 3 is OK
FAN PS-1 is NOT PRESENT
FAN PS-2 is OK
Switch 1: SYSTEM TEMPERATURE is OK
Inlet Temperature Value: 25 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 46 Degree Celsius
```

```
Red Threshold    : 56 Degree Celsius

Hotspot Temperature Value: 35 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 105 Degree Celsius
Red Threshold    : 125 Degree Celsius
SW  PID                Serial#      Status           Sys Pwr  PoE Pwr  Watts
--  -----------------  ----------   ---------------  -------  -------  -----
1A  Unknown            Unknown       No Input Power  Bad      Bad      235
1B  PWR-C1-350WAC      DCB2137H04P  OK               Good     Good     350
```

This example shows a sample output of the **show environment power** command:

```
Device> show environment power

SW  PID                Serial#      Status           Sys Pwr  PoE Pwr  Watts
--  -----------------  ----------   ---------------  -------  -------  -----
1A  Unknown            Unknown       No Input Power  Bad      Bad      235
1B  PWR-C1-350WAC      DCB2137H04P  OK               Good     Good     350
```

This example shows a sample output of the **show environment stack** command:

```
Device# show environment stack

System Temperature Value: 41 Degree Celsius
System Temperature State: GREEN
Yellow Threshold : 66 Degree Celsius
Red Threshold    : 76 Degree Celsius
```

This example shows a sample output of the **show environment temperature** command:

```
Device> show environment temperature

Switch 1: SYSTEM TEMPERATURE is OK
Inlet Temperature Value: 25 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 46 Degree Celsius
Red Threshold    : 56 Degree Celsius

Hotspot Temperature Value: 35 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 105 Degree Celsius
Red Threshold    : 125 Degree Celsius
```

Table 3: States in the show environment temperature status Command Output

State	Description
Green	The switch temperature is in the *normal* operating range.
Yellow	The temperature is in the *warning* range. You should check the external temperature around the switch.
Red	The temperature is in the *critical* 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
Cisco IOS XE Fuji 16.9.2	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.

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

```
Device> show errdisable detect
ErrDisable Reason   Detection   Mode
----------------    ---------   ----
arp-inspection      Enabled     port
bpduguard           Enabled     vlan
channel-misconfig   Enabled     port
community-limit     Enabled     port
dhcp-rate-limit     Enabled     port
dtp-flap            Enabled     port
gbic-invalid        Enabled     port
inline-power        Enabled     port
invalid-policy      Enabled     port
l2ptguard           Enabled     port
link-flap           Enabled     port
loopback            Enabled     port
lsgroup             Enabled     port
pagp-flap           Enabled     port
psecure-violation   Enabled     port/vlan
security-violatio   Enabled     port
sfp-config-mismat   Enabled     port
storm-control       Enabled     port
```

```
udld                Enabled    port
vmps                Enabled    port
```

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
Cisco IOS XE Fuji 16.9.2	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.

show ip interface

To display the usability status of interfaces configured for IP, use the **show ip interface** command in privileged EXEC mode.

show **ip** **interface** [*type* *number*] [**brief**]

Syntax Description	

type	(Optional) Interface type.
number	(Optional) Interface number.
brief	(Optional) Displays a summary of the usability status information for each interface.

Note	The output of the **show ip interface brief** command displays information of all the available interfaces whether or not the corresponding network module for these interfaces are connected. These interfaces can be configured if the network module is connected. Run the **show interface status** command to see which network modules are connected.

Command Default   The full usability status is displayed for all interfaces configured for IP.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   The Cisco IOS software automatically enters a directly connected route in the routing table if the interface is usable (which means that it can send and receive packets). If an interface is not usable, the directly connected routing entry is removed from the routing table. Removing the entry lets the software use dynamic routing protocols to determine backup routes to the network, if any.

If the interface can provide two-way communication, the line protocol is marked "up." If the interface hardware is usable, the interface is marked "up."

If you specify an optional interface type, information for that specific interface is displayed. If you specify no optional arguments, information on all the interfaces is displayed.

When an asynchronous interface is encapsulated with PPP or Serial Line Internet Protocol (SLIP), IP fast switching is enabled. A **show ip interface** command on an asynchronous interface encapsulated with PPP or SLIP displays a message indicating that IP fast switching is enabled.

You can use the **show ip interface brief** command to display a summary of the device interfaces. This command displays the IP address, the interface status, and other information.

The **show ip interface brief** command does not display any information related to Unicast RPF.

Examples   The following example shows interface information on Gigabit Ethernet interface 1/0/1:

```
Device# show ip interface gigabitethernet 1/0/1
```

```
GigabitEthernet1/0/1 is up, line protocol is up
  Internet address is 10.1.1.1/16
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP Feature Fast switching turbo vector
  IP VPN Flow CEF switching turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Policy routing is enabled, using route map PBR
  Network address translation is disabled
  BGP Policy Mapping is disabled
  IP Multi-Processor Forwarding is enabled
     IP Input features, "PBR",
         are not supported by MPF and are IGNORED
     IP Output features, "NetFlow",
         are not supported by MPF and are IGNORED
```

The following example shows how to display the usability status for a specific VLAN:

```
Device# show ip interface vlan 1

Vlan1 is up, line protocol is up
  Internet address is 10.0.0.4/24
  Broadcast address is 255.255.255.255
Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP CEF switching is enabled
```

```
IP Fast switching turbo vector
IP Normal CEF switching turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, CEF
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled
Sampled Netflow is disabled
IP multicast multilayer switching is disabled
Netflow Data Export (hardware) is enabled
```

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

Table 4: show ip interface Field Descriptions

Field	Description
Broadcast address is	Broadcast address.
Peer address is	Peer address.
MTU is	MTU value set on the interface, in bytes.
Helper address	Helper address, if one is set.
Directed broadcast forwarding	Shows whether directed broadcast forwarding is enabled.
Outgoing access list	Shows whether the interface has an outgoing access list set.
Inbound access list	Shows whether the interface has an incoming access list set.
Proxy ARP	Shows whether Proxy Address Resolution Protocol (ARP) is enabled for the interface.
Security level	IP Security Option (IPSO) security level set for this interface.
Split horizon	Shows whether split horizon is enabled.
ICMP redirects	Shows whether redirect messages will be sent on this interface.
ICMP unreachables	Shows whether unreachable messages will be sent on this interface.
ICMP mask replies	Shows whether mask replies will be sent on this interface.
IP fast switching	Shows whether fast switching is enabled for this interface. It is generally enabled on serial interfaces, such as this one.
IP Flow switching	Shows whether Flow switching is enabled for this interface.

Field	Description
IP CEF switching	Shows whether Cisco Express Forwarding switching is enabled for the interface.
IP multicast fast switching	Shows whether multicast fast switching is enabled for the interface.
IP route-cache flags are Fast	Shows whether NetFlow is enabled on an interface. Displays "Flow init" to specify that NetFlow is enabled on the interface. Displays "Ingress Flow" to specify that NetFlow is enabled on a subinterface using the **ip flow ingress**command. Shows "Flow" to specify that NetFlow is enabled on a main interface using the **ip route-cache flow** command.
Router Discovery	Shows whether the discovery process is enabled for this interface. It is generally disabled on serial interfaces.
IP output packet accounting	Shows whether IP accounting is enabled for this interface and what the threshold (maximum number of entries) is.
TCP/IP header compression	Shows whether compression is enabled.
WCCP Redirect outbound is disabled	Shows the status of whether packets received on an interface are redirected to a cache engine. Displays "enabled" or "disabled."
WCCP Redirect exclude is disabled	Shows the status of whether packets targeted for an interface will be excluded from being redirected to a cache engine. Displays "enabled" or "disabled."
Netflow Data Export (hardware) is enabled	NetFlow Data Expert (NDE) hardware flow status on the interface.

The following example shows how to display a summary of the usability status information for each interface:

```
Device# show ip interface brief

Interface            IP-Address      OK? Method Status                Protocol
Vlan1                unassigned      YES NVRAM  administratively down down
GigabitEthernet0/0   unassigned      YES NVRAM  down                  down
GigabitEthernet1/0/1 unassigned      YES NVRAM  down                  down
GigabitEthernet1/0/2 unassigned      YES unset  down                  down
GigabitEthernet1/0/3 unassigned      YES unset  down                  down
GigabitEthernet1/0/4 unassigned      YES unset  down                  down
GigabitEthernet1/0/5 unassigned      YES unset  down                  down
GigabitEthernet1/0/6 unassigned      YES unset  down                  down
GigabitEthernet1/0/7 unassigned      YES unset  down                  down

<output truncated>
```

Table 5: show ip interface brief Field Descriptions

Field	Description
Interface	Type of interface.

Field	Description
IP-Address	IP address assigned to the interface.
OK?	"Yes" means that the IP Address is valid. "No" means that the IP Address is not valid.
Method	The Method field has the following possible values: • RARP or SLARP: Reverse Address Resolution Protocol (RARP) or Serial Line Address Resolution Protocol (SLARP) request. • BOOTP: Bootstrap protocol. • TFTP: Configuration file obtained from the TFTP server. • manual: Manually changed by the command-line interface. • NVRAM: Configuration file in NVRAM. • IPCP: **ip address negotiated** command. • DHCP: **ip address dhcp** command. • unset: Unset. • other: Unknown.
Status	Shows the status of the interface. Valid values and their meanings are: • up: Interface is up. • down: Interface is down. • administratively down: Interface is administratively down.
Protocol	Shows the operational status of the routing protocol on this interface.

Related Commands

Command	Description
ip interface	Configures a virtual gateway IP interface on a Secure Socket Layer Virtual Private Network (SSL VPN) gateway
show interface status	Displays the status of the interface.

show interfaces

To display the administrative and operational status of all interfaces or for a specified interface, use the **show interfaces** command in the EXEC mode.

show interfaces [{ *interface-id* | **vlan** *vlan-id* }] [{ **accounting** | **capabilities** [**module** *number*] | **description** | **etherchannel** | **flowcontrol** | **link** [**module** *number*] | **private-vlan mapping** | **pruning** | **stats** | **status** [{ **err-disabled** | **inactive** }] | **trunk** }]

Syntax Description		
interface-id	(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.	
vlan *vlan-id*	(Optional) VLAN identification. The range is 1 to 4094.	
accounting	(Optional) Displays accounting information on the interface, including active protocols and input and output packets and octets.	
	Note	The display shows only packets processed in software; hardware-switched packets do not appear.
capabilities	(Optional) Displays the capabilities of all interfaces or the specified interface, including the features and options that you can configure on the interface. Though visible in the command line help, this option is not available for VLAN IDs.	
module *number*	(Optional) Displays capabilities of all interfaces on the switch or specified stack member.	
	This option is not available if you entered a specific interface ID.	
description	(Optional) Displays the administrative status and description set for interfaces.	
	Note	The output of the **show interfaces description** command displays information of all the available interfaces whether or not the corresponding network module for these interfaces are connected. These interfaces can be configured if the network module is connected. Run the **show interface status** command to see which network modules are connected.
etherchannel	(Optional) Displays interface EtherChannel information.	
flowcontrol	(Optional) Displays interface flow control information.	
link [**module***number*]	(Optional) Displays the up time and down time of the interface.	

private-vlan mapping	(Optional) Displays private-VLAN mapping information for the VLAN switch virtual interfaces (SVIs). This keyword is not available if the switch is running the LAN base feature set.
pruning	(Optional) Displays trunk VTP pruning information for the interface.
stats	(Optional) Displays the input and output packets by switching the path for the interface.
status	(Optional) Displays the status of the interface. A status of unsupported in the Type field means that a non-Cisco small form-factor pluggable (SFP) module is inserted in the module slot.
err-disabled	(Optional) Displays interfaces in an error-disabled state.
inactive	(Optional) Displays interfaces in an inactive state.
trunk	(Optional) Displays interface trunk information. If you do not specify an interface, only information for active trunking ports appears.

Note Though visible in the command-line help strings, the **crb**, **fair-queue**, **irb**, **mac-accounting**, **precedence**, **random-detect**, **rate-limit**, and **shape** keywords are not supported.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.
Cisco IOS XE Gibraltar 16.12.1	The **link** keyword was introduced.

Usage Guidelines The **show interfaces capabilities** command with different keywords has these results:

- Use the **show interface capabilities module** *number* command to display the capabilities 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.

- Use the **show interfaces** *interface-id* **capabilities** to display the capabilities of the specified interface.

- Use the **show interfaces capabilities** (with no module number or interface ID) to display the capabilities of all interfaces in the stack.

Note The field **Last Input** displayed in the command output indicates the number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed by the CPU on the device. This information can be used to know when a dead interface failed.

Last Input is not updated by fast-switched traffic.

The field **output** displayed in the command output indicates the number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. The information provided by this field can useful for knowing when a dead interface failed.

The **show interfaces link** command with different keywords has these results:

- Use the **show interface link module** *number* command to display the up time and down time 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.

Note On a standalone switch, the **module** *number* refers to the slot number.

- Use the **show interfaces** *interface-id* **link** to display the up time and down time of the specified interface.

- Use the **show interfaces link** (with no module number or interface ID) to display the up time and down time of all interfaces in the stack.

- If the interface is up, the up time displays the time (hours, minutes, and seconds) and the down time displays 00:00:00.

- If the interface is down, only the down time displays the time (hours, minutes, and seconds).

Examples

This is an example of output from the **show interfaces** command for an interface on stack member 3:

```
Device# show interfaces gigabitethernet3/0/2

GigabitEthernet3/0/2 is down, line protocol is down (notconnect)
  Hardware is Gigabit Ethernet, address is 2037.064d.4381 (bia 2037.064d.4381)
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Auto-duplex, Auto-speed, media type is 10/100/1000BaseTX
  input flow-control is off, output flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/2000/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
```

```
         0 input packets with dribble condition detected
         0 packets output, 0 bytes, 0 underruns
         0 output errors, 0 collisions, 1 interface resets
         0 unknown protocol drops
         0 babbles, 0 late collision, 0 deferred
         0 lost carrier, 0 no carrier, 0 pause output
         0 output buffer failures, 0 output buffers swapped out


Device# show interfaces accounting

Vlan1
                Protocol    Pkts In    Chars In    Pkts Out    Chars Out
                      IP          0           0           6          378
Vlan200
                Protocol    Pkts In    Chars In    Pkts Out    Chars Out
No traffic sent or received on this interface.
GigabitEthernet0/0
                Protocol    Pkts In    Chars In    Pkts Out    Chars Out
                   Other     165476    11417844           0            0
           Spanning Tree    1240284    64494768           0            0
                     ARP       7096      425760           0            0
                     CDP      41368    18781072       82908     35318808
GigabitEthernet1/0/1
                Protocol    Pkts In    Chars In    Pkts Out    Chars Out
No traffic sent or received on this interface.
GigabitEthernet1/0/2
                Protocol    Pkts In    Chars In    Pkts Out    Chars Out
No traffic sent or received on this interface.

<output truncated>
```

This is an example of output from the **show interfaces** *interface* **description** command when the interface has been described as *Connects to Marketing* by using the **description** interface configuration command:

```
Device# show interfaces gigabitethernet1/0/2 description

Interface                      Status       Protocol Description
Gi1/0/2                        up           down     Connects to Marketing


Device# show interfaces etherchannel
----
Port-channel34:
Age of the Port-channel   = 28d:18h:51m:46s
Logical slot/port   = 12/34           Number of ports = 0
GC                  = 0x00000000      HotStandBy port = null
Passive port list   =
Port state          = Port-channel L3-Ag Ag-Not-Inuse
Protocol            =    -
Port security       = Disabled
```

This is an example of output from the **show interfaces** *interface-id* **pruning** command when pruning is enabled in the VTP domain:

```
Device# show interfaces gigabitethernet1/0/2 pruning

Port      Vlans pruned for lack of request by neighbor
Gi1/0/2   3,4

Port      Vlans traffic requested of neighbor
```

```
Gi1/0/2   1-3
```

This is an example of output from the **show interfaces stats** command for a specified VLAN interface:

```
Device# show interfaces vlan 1 stats

Switching path    Pkts In    Chars In    Pkts Out    Chars Out
     Processor    1165354   136205310      570800     91731594
   Route cache          0           0           0            0
         Total    1165354   136205310      570800     91731594
```

This is an example of output from the **show interfaces status err-disabled** command. It displays the status of interfaces in the error-disabled state:

```
Device# show interfaces status err-disabled

Port       Name        Status       Reason
Gi1/0/2                err-disabled  gbic-invalid
Gi2/0/3                err-disabled  dtp-flap
```

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

```
Device# show interfaces gigabitethernet1/0/2 pruning

Port Vlans pruned for lack of request by neighbor


Device# show interfaces gigabitethernet1/0/1 trunk

Port        Mode            Encapsulation Status        Native vlan
Gi1/0/1     on              802.1q        other         10

Port        Vlans allowed on trunk
Gi1/0/1     none

Port        Vlans allowed and active in management domain
Gi1/0/1     none

Port        Vlans in spanning tree forwarding state and not pruned
Gi1/0/1     none
```

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

```
Device# show interfaces description

Interface                 Status          Protocol Description
Vl1                       admin down      down
Gi0/0                     down            down
Gi1/0/1                   down            down
Gi1/0/2                   down            down
Gi1/0/3                   down            down
Gi1/0/4                   down            down
Gi1/0/5                   down            down
Gi1/0/6                   down            down
Gi1/0/7                   down            down

<output truncated>
```

The following is a sample output of the **show interfaces link** command:

```
Device> enable
Device# show interfaces link
Port            Name            Down Time       Up Time
Gi1/0/1                         6w0d
Gi1/0/2                         6w0d
Gi1/0/3                         00:00:00        5w3d
Gi1/0/4                         6w0d
Gi1/0/5                         6w0d
Gi1/0/6                         6w0d
Gi1/0/7                         6w0d
Gi1/0/8                         6w0d
Gi1/0/9                         6w0d
Gi1/0/10                        6w0d
Gi1/0/11                        2d17h
Gi1/0/12                        6w0d
Gi1/0/13                        6w0d
Gi1/0/14                        6w0d
Gi1/0/15                        6w0d
Gi1/0/16                        6w0d
Gi1/0/17                        6w0d
Gi1/0/18                        6w0d
Gi1/0/19                        6w0d
Gi1/0/20                        6w0d
Gi1/0/21                        6w0d
```

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** *member-number* | **protocol status** | **trunk**}]

Syntax Description		
interface-id		(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 *member-number*		(Optional) Displays counters for the specified member.
		The range is 1 to 9.
	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
Cisco IOS XE Fuji 16.9.2	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.

```
Device# 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 module 2. It displays all counters for the specified switch in the module.

```
Device# 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:

```
Device# 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.

```
Device# 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** [{**module** *number*}]

Syntax Description	*interface-id*	(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.
	module *number*	(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**

Release	Modification
Cisco IOS XE Fuji 16.9.2	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.

```
Device# 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
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.

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		
	interface-id	(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
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Examples

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

```
Device# show interfaces transceiver

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

                                              Optical   Optical
              Temperature  Voltage  Current   Tx Power  Rx Power
Port          (Celsius)    (Volts)  (mA)      (dBm)     (dBm)
---------     -----------  -------  --------  --------  --------
Gi5/1/2         42.9        3.28     22.1      -5.4      -8.1
Te5/1/3         32.0        3.28     19.8       2.4      -4.2


Device# show interfaces gigabitethernet1/1/1 transceiver properties
  Name : Gi1/1/1
  Administrative Speed: auto
```

```
Operational Speed: auto
Administrative Duplex: auto
Administrative Power Inline: enable
Operational Duplex: auto
Administrative Auto-MDIX: off
Operational Auto-MDIX: off
```

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

```
Device# 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.
```

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

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

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

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

```
Device# show interfaces transceiver supported-list
Transceiver Type          Cisco p/n min version
                              supporting DOM
------------------        ------------------------

  DWDM GBIC               ALL
  DWDM SFP                ALL
  RX only WDM GBIC        ALL
  DWDM XENPAK             ALL
  DWDM X2                 ALL
  DWDM XFP                ALL
  CWDM GBIC               NONE
  CWDM X2                 ALL
  CWDM XFP                ALL
  XENPAK ZR               ALL
  X2 ZR                   ALL
  XFP ZR                  ALL
  Rx_only_WDM_XENPAK      ALL
  XENPAK_ER               10-1888-04
  X2_ER                   ALL
  XFP_ER                  ALL
  XENPAK_LR               10-1838-04
```

```
                   X2_LR                     ALL
                   XFP_LR                    ALL
                   XENPAK_LW                 ALL
                   X2_LW                     ALL
                   XFP_LW                    NONE
                   XENPAK SR                 NONE
                   X2 SR                     ALL
                   XFP SR                    ALL
                   XENPAK LX4                NONE
                   X2 LX4                    NONE
                   XFP LX4                   NONE
                   XENPAK CX4                NONE
                   X2 CX4                    NONE
                   XFP CX4                   NONE
                   SX GBIC                   NONE
                   LX GBIC                   NONE
                   ZX GBIC                   NONE
                   CWDM_SFP                  ALL
                   Rx_only_WDM_SFP           NONE
                   SX_SFP                    ALL
                   LX_SFP                    ALL
                   ZX_SFP                    ALL
                   EX_SFP                    ALL
                   SX SFP                    NONE
                   LX SFP                    NONE
                   ZX SFP                    NONE
                   GIgE BX U SFP             NONE
                   GigE BX D SFP             ALL
                   X2 LRM                    ALL
                   SR_SFPP                   ALL
                   LR_SFPP                   ALL
                   LRM_SFPP                  ALL
                   ER_SFPP                   ALL
                   ZR_SFPP                   ALL
                   DWDM_SFPP                 ALL
                   GIgE BX 40U SFP           ALL
                   GigE BX 40D SFP           ALL
                   GigE BX 40DA SFP          ALL
                   GIgE BX 80U SFP           ALL
                   GigE BX 80D SFP           ALL
                   GIG BXU_SFPP              ALL
                   GIG BXD_SFPP              ALL
                   GIG BX40U_SFPP            ALL
                   GIG BX40D_SFPP            ALL
                   GigE Dual Rate LX SFP     ALL
                   CWDM_SFPP                 ALL
                   CPAK_SR10                 ALL
                   CPAK_LR4                  ALL
                   QSFP_LR                   ALL
                   QSFP_SR                   ALL
```

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

```
Device# 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>
```

Related Commands	Command	Description
	transceiver type all	Enters the transceiver type configuration mode.
	monitoring	Enables digital optical monitoring.

show macro auto

To display Auto Smartports macro information, use the **show macro auto** command in user EXEC mode.

show macro auto {**address-group** *address-group-name* | **device** [**access-point**] [**ip-camera**] [**lightweight-ap**] [**media-player**] [**phone**] [**router**] [**switch**] | **global** [*event_trigger*] | **interface** [*interface_id*]}

Syntax Description		
	address-group [*address-group-name*]	Displays address-group information.
		(Optional) *address-group-name*—Displays information for the specified address group.
	device [*access-point*] [*ip-camera*] [*lightweight-ap*] [*media-player*] [*phone*] [*router*] [*switch*]	Displays device information about one or more devices.
		• (Optional) **access-point**—Autonomous access point
		• (Optional) **ip-camera**—Cisco IP video surveillance camera
		• (Optional) **lightweight-ap**—Lightweight access point
		• (Optional) **media-player**—Digital media player
		• (Optional) phone—Cisco IP phone
		• (Optional) **router**—Cisco router
		• (Optional) **switch**—Cisco switch
	global [*event_trigger*]	Displays Auto Smartports information about the switch.
		(Optional) *event_trigger*—Displays information about the specified event trigger.
	interface [*interface_id*]	Displays interface status.
		(Optional) *interface_id*—isplays information about the specified interface.

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

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   Use this command to display the Auto SmartPorts information for the switch. Use the **show macro auto device** command to display the configurable parameters for a device.

Example

This example shows how to use the **show macro auto device** to view the configuration on the switch:

```
Device# show macro auto device
Device:lightweight-ap
Default Macro:CISCO_LWAP_AUTO_SMARTPORT
Current Macro:CISCO_LWAP_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN
Defaults Parameters:ACCESS_VLAN=1
Current Parameters:ACCESS_VLAN=1

Device:access-point
Default Macro:CISCO_AP_AUTO_SMARTPORT
Current Macro:CISCO_AP_AUTO_SMARTPORT
Configurable Parameters:NATIVE_VLAN
Defaults Parameters:NATIVE_VLAN=1
Current Parameters:NATIVE_VLAN=1

Device:phone
Default Macro:CISCO_PHONE_AUTO_SMARTPORT
Current Macro:CISCO_PHONE_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN VOICE_VLAN
Defaults Parameters:ACCESS_VLAN=1 VOICE_VLAN=2
Current Parameters:ACCESS_VLAN=1 VOICE_VLAN=2

Device:router
Default Macro:CISCO_ROUTER_AUTO_SMARTPORT
Current Macro:CISCO_ROUTER_AUTO_SMARTPORT
Configurable Parameters:NATIVE_VLAN
Defaults Parameters:NATIVE_VLAN=1
Current Parameters:NATIVE_VLAN=1

Device:switch
Default Macro:CISCO_SWITCH_AUTO_SMARTPORT
Current Macro:CISCO_SWITCH_AUTO_SMARTPORT
Configurable Parameters:NATIVE_VLAN
Defaults Parameters:NATIVE_VLAN=1
Current Parameters:NATIVE_VLAN=1

Device:ip-camera
Default Macro:CISCO_IP_CAMERA_AUTO_SMARTPORT
Current Macro:CISCO_IP_CAMERA_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN
Defaults Parameters:ACCESS_VLAN=1
Current Parameters:ACCESS_VLAN=1

Device:media-player
Default Macro:CISCO_DMP_AUTO_SMARTPORT
Current Macro:CISCO_DMP_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN
Defaults Parameters:ACCESS_VLAN=1
Current Parameters:ACCESS_VLAN=1
```

This example shows how to use the **show macro auto address-group name** command to view the TEST3 address group configuration on the switch:

```
Device# show macro auto address-group TEST3MAC Address Group Configuration:
```

```
Group Name OUI  MAC ADDRESS
-------------------------------------------------------------
TEST3 2233.33    0022.0022.0022
2233.34
```

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
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   Free memory is accurately computed and displayed in the Free Memory field of the command output.

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
  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	*switch-num*	(Optional) Number of the switch.

Command Default None

Command Modes User EXEC (>)

Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines Entering the **show module** command without the *switch-num* argument is the same as entering the show module all command.

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
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

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

```
Device# 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 parser macro

To display the parameters for all configured macros or for one macro on the switch, use the **show parser macro** command in user EXEC mode.

show parser macro {**brief** | **description** [**interface** *interface-id*] | **name** *macro-name*}

Syntax Description		
	brief	(Optional) Displays the name of each macro.
	description [**interface** *interface-id*]	(Optional) Displays all macro descriptions or the description of a specific interface.
	name *macro-name*	(Optional) Displays information about a single macro identified by the macro name.

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

This is a partial output example from the **show parser macro** command. The output for the Cisco-default macros varies depending on the switch platform and the software image running on the switch:

```
Device# show parser macro
Total number of macros = 6
--------------------------------------------------------------
Macro name : cisco-global
Macro type : default global
# Enable dynamic port error recovery for link state
# failures
errdisable recovery cause link-flap
errdisable recovery interval 60

<output truncated>


--------------------------------------------------------------
Macro name : cisco-desktop
Macro type : default interface
# macro keywords $AVID
# Basic interface - Enable data VLAN only
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access

<output truncated>


--------------------------------------------------------------
Macro name : cisco-phone
```

```
Macro type : default interface
# Cisco IP phone + desktop template
# macro keywords $AVID $VVID
# VoIP enabled interface - Enable data VLAN
# and voice VLAN (VVID)
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access

<output truncated>


--------------------------------------------------------------
Macro name : cisco-switch
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Do not apply to EtherChannel/Port Group
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID

<output truncated>


--------------------------------------------------------------
Macro name : cisco-router
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID

<output truncated>


--------------------------------------------------------------
Macro name : snmp
Macro type : customizable

#enable port security, linkup, and linkdown traps
snmp-server enable traps port-security
snmp-server enable traps linkup
snmp-server enable traps linkdown
#set snmp-server host
snmp-server host ADDRESS
#set SNMP trap notifications precedence
snmp-server ip precedence VALUE


--------------------------------------------------------------
```

This example shows the output from the **show parser macro name** command:

```
Device# show parser macro name standard-switch10
Macro name : standard-switch10
Macro type : customizable
macro description standard-switch10
# Trust QoS settings on VOIP packets
auto qos voip trust
# Allow port channels to be automatically formed
channel-protocol pagp
```

This example shows the output from the **show parser macro brief** command:

```
Device# show parser macro brief
    default global   : cisco-global
    default interface: cisco-desktop
    default interface: cisco-phone
    default interface: cisco-switch
    default interface: cisco-router
    customizable     : snmp
```

This exampe shows the output from the **show parser macro description** command:

```
Device# show parser macro description
Global Macro(s): cisco-global
Interface    Macro Description(s)
--------------------------------------------------------------
Gi1/0/1        standard-switch10
Gi1/0/2      this is test macro
--------------------------------------------------------------
```

This example shows the output from the **show parser macro description interface** command:

```
Device# show parser macro description interface gigabitethernet1/0/2
Interface    Macro Description
--------------------------------------------------------------
Gi1/0/2      this is test macro
--------------------------------------------------------------
```

show platform hardware bluetooth

To display information about Bluetooth interface, use the **show platform hardware bluetooth** command in privileged EXEC mode.

show platform hardware bluetooth

| **Command Default** | None |

| **Command Modes** | Privileged EXEC (#) |

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   The **show platform hardware bluetooth** command is to be used when an external USB Bluetooth dongle is connected on the device.

Examples   This example shows how to display the information of the Bluetooth interface using the **show platform hardware bluetooth** command.

```
Device> enable
Device# show platform hardware bluetooth
Controller: 0:1a:7d:da:71:13
Type: Primary
Bus: USB
State: DOWN
Name:
HCI Version:
```

show platform hardware fed switch forward interface

To debug forwarding information and to trace the packet path in the hardware forwarding plane, use the **show platform hardware fed switch** *switch_number* **forward interface** command. This command simulates a user-defined packet and retrieves the forwarding information from the hardware forwarding plane. A packet is generated on the ingress port based on the packet parameters that you have specified in this command. You can also provide a complete packet from the captured packets stored in a PCAP file.

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

show platform hardware fed switch {*switch_num* | **active** | **standby**} **forward interface** *interface-type interface-number* **source-mac-address** *destination-mac-address*{*protocol-number* | **arp** | **cos** | **ipv4** | **ipv6** | **mpls**}

show platform hardware fed switch {*switch_num* | **active** | **standby**} **forward interface** *interface-type interface-number* **pcap** *pcap-file-name* **number** *packet-number* **data**

show platform hardware fed switch {*switch_num* | **active** | **standby**} **forward interface** *interface-type interface-number* **vlan** *vlan-id source-mac-address destination-mac-address*{*protocol-number* | **arp** | **cos** | **ipv4** | **ipv6** | **mpls**}

Syntax Description		
switch { *switch_num*	**active**	**standby** }	The switch on which packet tracing has to be scheduled. The input port should be available on this switch. You have the following options : • *switch_num*—ID of the switch on which the ingress port is present. • **active**—indicates the active switch on which the the ingress port is present. • **standby**—indicates the standby switch on which the ingress port is present. **Note** This keyword is not supported.
interface *interface-type interface-number*	The input interface on which packet trace is simulated.
source-mac-address	The source MAC address of the packet you want to simulate.
destination-mac-address	The MAC address of the destination interface in hexadecimal format.
protocol-number	The number assigned to any L3 protocol.
arp	The Address Resolution Protocol (ARP) parameters.
ipv4	The IPv4 packet parameters.
ipv6	The IPv6 packet parameters.
mpls	The Multiprotocol Label Switching (MPLS) label parameters.

cos	The class of service (CoS) number from 0 to 7 to set priority.
pcap *pcap-file-name*	Name of the pcap file in internal flash (flash:).
	Ensure that the file already exists in flash:.
number *packet-number*	Specifies the packet number in the pcap file.
vlan *vlan-id*	VLAN id of the dot1q header in the simulated packet. The range is 1 to 4096.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.
Cisco IOS XE Fuji 16.9.1	The command was enhanced to support MPLS/ARP/VxLAN packet parameters and trace packets captured in a PCAP file.
Cisco IOS XE Gibraltar 16.10.1	The command was enhanced to support data capture across a stack.

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.

This command supports the following packet types:

- Non-IP packets with any L3 protocol

- ARP packets

- IPv4 packets with any L4 protocol

- IPv4 packets with TCP/UDP/IGMP/ICMP/SCTP payload

- VxLAN packets

- MPLS packets with up to 3 Labels and meta data

- MPLS packets with IPv4/IPv6 payload

- IPv6 packets with TCP/UDP/IGMP/ICMP/SCTP payload

In a stack environment, you can trace packets across the stack irrespective of the number of stack members and topology. The **show platform hardware fed switch** *switch-number* **forward interface** *interface-type* *interface-number* command consolidates packet-forwarding information of all the stack members on the ingress switch. To achieve this, ensure that the switch number specified in the *switch_num* and *interface-number* arguments are of the input switch and that the number matches.

To trace any particular packet from the captured packets stored in a PCAP file, use the **show platform hardware fed switch forward interface** *interface-type* *interface-number* **pcap** *pcap-file-name number* *packet-number* **data** command.

Example

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

```
Device#show platform hardware fed switch active forward interface gigabitEthernet 1/0/35
0000.0022.0055 0000.0055.0066 ipv4 44.44.0.2 55.55.0.2 udp 1222 3333

Show forward is running in the background. After completion, syslog will be generated.

*Sep 24 05:57:36.614: %SHFWD-6-PACKET_TRACE_DONE: Switch 1 R0/0: fed: Packet Trace Complete:
  Execute (show platform hardware fed switch <> forward last summary|detail)
*Sep 24 05:57:36.614: %SHFWD-6-PACKET_TRACE_FLOW_ID: Switch 1 R0/0: fed: Packet Trace Flow
 id is 150323855361
```

	Command	Description
Related Commands	**monitor capture interface**	Configures monitor capture points specifying an attachment point and the packet flow direction.
	monitor capture start	Starts the capture of packet data at a traffic trace point into a buffer.
	monitor capture stop	Stops the capture of packet data at a traffic trace point.
	monitor capture export	Saves the captured packets in the buffer. Use this command to export the monitor capture buffer to a pcap file in flash: that you can use as an input in the **show forward** with **pcap**.

show platform hardware fed active fwd-asic resource tcam utilization

To display hardware information about the Ternary Content Addressable Memory (TCAM) usage, use the **show platform hardware fed active fwd-asic resource tcam utilization** command in privileged EXEC mode.

show platform hardware fed active fwd-asic resource tcam utilization[{*asic-number* }]

Syntax Description

asic-number	ASIC number. Valid values are from 0 to 7.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced in a release prior to Cisco IOS XE Amsterdam 17.2.1 .

Usage Guidelines

On stackable switches, this command has the **switch** keyword, **show platform hardware fed switch active fwd-asic resource tcam utilization**. On non-stackable switches, the **switch** keyword is not available.

Example

The following is sample output from the **show platform hardware fed active fwd-asic resource tcam utilization** command:

```
Device# show platform hardware fed active fwd-asic resource tcam utilization

Codes: EM - Exact_Match, I - Input, O - Output, IO - Input & Output, NA - Not Applicable

CAM Utilization for ASIC  [0]
 Table                 Subtype     Dir     Max     Used     %Used     V4        V6
MPLS     Other

-------------------------------------------------------------------------------------------------

 OPENFLOW Table0       TCAM        I       5000     5        0%        3         0
      0       2
 OPENFLOW Table0 Ext.  EM          I       8192     3        0%        0         0
      0       3
 OPENFLOW Table1       TCAM        I       3600     1        0%        1         0
      0       0
 OPENFLOW Table1 Ext.  EM          I       8192     1        0%        0         0
      0       1
 OPENFLOW Table2       TCAM        I       3500     1        0%        1         0
      0       0
 OPENFLOW Table2 Ext.  EM          I       8192     1        0%        0         0
      0       1
 OPENFLOW Table3 Ext.  EM          I       8192     0        0%        0         0
      0       0
 OPENFLOW Table4 Ext.  EM          I       8192     0        0%        0         0
      0       0
```

```
OPENFLOW  Table5 Ext.    EM            I          8192         0         0%         0         0
      0         0
OPENFLOW  Table6 Ext.    EM            I          8192         0         0%         0         0
      0         0
OPENFLOW  Table7 Ext.    EM            I          8192         0         0%         0         0
      0         0
```

The table below lists the significant fields shown in the display.

Table 6: show platform hardware fed active fwd-asic resource tcam utilization Field Descriptions

Field	Description
Table	OpenFlow table numbers.
Subtype	What are the different subtypes available?
Dir	
Max	
Used	
%Used	
V4	
V6	
MPLS	
Other	

show platform resources

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

show platform resources

This command has no arguments or keywords.

Command Modes
Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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            Usage           Max        Warning        Critical
     State
---------------------------------------------------------------------------------

 Control Processor   7.20%           100%       90%            95%
     H
  DRAM               2701MB(69%)     3883MB     90%            95%
     H
```

show platform software audit

To display the SE Linux Audit logs, use the **show platform software audit** command in privileged EXEC mode.

show platform software audit {**all** | **summary** | [**switch** {*switch-number* | **active** | **standby**}] {**0** | **F0** | **R0** | {**FP** | **RP**} {**active**}}}

Syntax Description

all	Shows the audit log from all the slots.
summary	Shows the audit log summary count from all the slots.
switch	Shows the audit logs for a slot on a specific switch.
switch-number	Selects the switch with the specified switch number.
switch active	Selects the active instance of the switch.
standby	Selects the standby instance of the switch.
0	Shows the audit log for the SPA-Inter-Processor slot 0.
F0	Shows the audit log for the Embedded-Service-Processor slot 0.
R0	Shows the audit log for the Route-Processor slot 0.
FP active	Shows the audit log for the active Embedded-Service-Processor slot.
RP active	Shows the audit log for the active Route-Processor slot.

Command Modes   Privileged EXEC (#)

Command History

Usage Guidelines   This command was introduced in the Cisco IOS XE Gibraltar 16.10.1 as a part of the SELinux Permissive Mode feature. The **show platform software audit** command displays the system logs containing the access violation events.

In Cisco IOS XE Gibraltar 16.10.1, operation in a permissive mode is available - with the intent of confining specific components (process or application) of the IOS-XE platform. In the permissive mode, access violation events are detected and system logs are generated, but the event or operation itself is not blocked. The solution operates mainly in an access violation detection mode.

The following is a sample output of the **show software platform software audit summary** command:

```
Device# show platform software audit summary

===================================
AUDIT LOG ON switch 1
-----------------------------------
```

```
AVC Denial count: 58
==================================
```

The following is a sample output of the **show software platform software audit all** command:

```
Device# show platform software audit all

==================================
AUDIT LOG ON switch 1
----------------------------------
========== START ============
type=AVC msg=audit(1539222292.584:100): avc:  denied  { read } for  pid=14017
comm="mcp_trace_filte" name="crashinfo" dev="rootfs" ino=13667
scontext=system_u:system_r:polaris_trace_filter_t:s0
tcontext=system_u:object_r:polaris_disk_crashinfo_t:s0 tclass=lnk_file permissive=1
type=AVC msg=audit(1539222292.584:100): avc:  denied  { getattr } for  pid=14017
comm="mcp_trace_filte" path="/mnt/sd1" dev="sda1" ino=2
scontext=system_u:system_r:polaris_trace_filter_t:s0
tcontext=system_u:object_r:polaris_disk_crashinfo_t:s0 tclass=dir permissive=1
type=AVC msg=audit(1539222292.586:101): avc:  denied  { getattr } for  pid=14028 comm="ls"
 path="/tmp/ufs/crashinfo" dev="tmpfs" ino=58407
scontext=system_u:system_r:polaris_trace_filter_t:s0
tcontext=system_u:object_r:polaris_ncd_tmp_t:s0 tclass=dir permissive=1
type=AVC msg=audit(1539222292.586:102): avc:  denied  { read } for  pid=14028 comm="ls"
name="crashinfo" dev="tmpfs" ino=58407 scontext=system_u:system_r:polaris_trace_filter_t:s0
 tcontext=system_u:object_r:polaris_ncd_tmp_t:s0 tclass=dir permissive=1
type=AVC msg=audit(1539438600.896:119): avc:  denied  { execute } for  pid=8300 comm="sh"
name="id" dev="loop0" ino=6982 scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
 tcontext=system_u:object_r:bin_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438600.897:120): avc:  denied  { execute_no_trans } for  pid=8300
comm="sh"
path="/tmp/sw/mount/cat9k-rpbase.2018-10-02_00.13_mhungund.SSA.pkg/nyquist/usr/bin/id"
dev="loop0" ino=6982 scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:bin_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438615.535:121): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
type=AVC msg=audit(1539438624.916:122): avc:  denied  { execute_no_trans } for  pid=8600
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438648.936:123): avc:  denied  { execute_no_trans } for  pid=9307
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438678.649:124): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
type=AVC msg=audit(1539438696.969:125): avc:  denied  { execute_no_trans } for  pid=10057
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438732.973:126): avc:  denied  { execute_no_trans } for  pid=10858
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438778.008:127): avc:  denied  { execute_no_trans } for  pid=11579
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438800.156:128): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
type=AVC msg=audit(1539438834.099:129): avc:  denied  { execute_no_trans } for  pid=12451
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
```

```
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539440246.697:149): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
type=AVC msg=audit(1539440299.119:150): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
========== END ============
==================================
```

The following is a sample output of the **show software platform software audit switch** command:

```
Device# show platform software audit switch active R0

========== START ============
type=AVC msg=audit(1539222292.584:100): avc:  denied  { read } for  pid=14017
comm="mcp_trace_filte" name="crashinfo" dev="rootfs" ino=13667
scontext=system_u:system_r:polaris_trace_filter_t:s0
tcontext=system_u:object_r:polaris_disk_crashinfo_t:s0 tclass=lnk_file permissive=1
type=AVC msg=audit(1539222292.584:100): avc:  denied  { getattr } for  pid=14017
comm="mcp_trace_filte" path="/mnt/sd1" dev="sda1" ino=2
scontext=system_u:system_r:polaris_trace_filter_t:s0
tcontext=system_u:object_r:polaris_disk_crashinfo_t:s0 tclass=dir permissive=1
type=AVC msg=audit(1539222292.586:101): avc:  denied  { getattr } for  pid=14028 comm="ls"
 path="/tmp/ufs/crashinfo" dev="tmpfs" ino=58407
scontext=system_u:system_r:polaris_trace_filter_t:s0
tcontext=system_u:object_r:polaris_ncd_tmp_t:s0 tclass=dir permissive=1
type=AVC msg=audit(1539222292.586:102): avc:  denied  { read } for  pid=14028 comm="ls"
name="crashinfo" dev="tmpfs" ino=58407 scontext=system_u:system_r:polaris_trace_filter_t:s0
 tcontext=system_u:object_r:polaris_ncd_tmp_t:s0 tclass=dir permissive=1
type=AVC msg=audit(1539438624.916:122): avc:  denied  { execute_no_trans } for  pid=8600
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438648.936:123): avc:  denied  { execute_no_trans } for  pid=9307
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438678.649:124): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
type=AVC msg=audit(1539438696.969:125): avc:  denied  { execute_no_trans } for  pid=10057
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438732.973:126): avc:  denied  { execute_no_trans } for  pid=10858
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438778.008:127): avc:  denied  { execute_no_trans } for  pid=11579
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438800.156:128): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
type=AVC msg=audit(1539438834.099:129): avc:  denied  { execute_no_trans } for  pid=12451
comm="auto_upgrade_se" path="/bin/bash" dev="rootfs" ino=7276
scontext=system_u:system_r:polaris_auto_upgrade_server_rp_t:s0
tcontext=system_u:object_r:shell_exec_t:s0 tclass=file permissive=1
type=AVC msg=audit(1539438860.907:130): avc:  denied  { name_connect } for  pid=26421
comm="nginx" dest=8098 scontext=system_u:system_r:polaris_nginx_t:s0
tcontext=system_u:object_r:polaris_caf_api_port_t:s0 tclass=tcp_socket permissive=1
```

```
========= END ===========
==============================
```

show platform software fed switch punt cpuq rates

To display the rate at which packets are punted, including the drops in the punted path, use the **show platform software fed switch punt cpuq rates** command in privileged EXEC mode.

show platform software fed switch {*switch-number* | **active** | **standby**} **punt cpuq rates**

Syntax Description	

switch{*switch-number* | **active** | **standby**}	Displays information about the switch. You have the following options: • *switch-number.* • **active** —Displays information relating to the active switch. • **standby**—Displays information relating to the standby switch, if available. **Note** This keyword is not supported.
punt	Specifies the punt informtion.
cpuq	Specifies information about CPU receive queue.
rates	Specifies the rate at which the packets are punted.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The output of this command displays the rate in packets per second at intervals of 10 seconds, 1 minute and 5 minutes.

Example

The following is sample output from the **show platform software fed switch active punt cpuq rates** command.

```
Device#show platform software fed switch active punt cpuq rates

Punt Rate CPU Q Statistics


Packets per second averaged over 10 seconds, 1 min and 5 mins
================================================================================
Q  |        Queue          | Rx   | Rx   | Rx   | Drop  | Drop  | Drop
no |        Name            | 10s  | 1min | 5min | 10s   | 1min  | 5min
================================================================================
0   CPU_Q_DOT1X_AUTH              0      0      0       0       0       0
1   CPU_Q_L2_CONTROL             0      0      0       0       0       0
2   CPU_Q_FORUS_TRAFFIC        336    266    320       0       0       0
```

```
 3  CPU_Q_ICMP_GEN                    0      0      0      0      0      0
 4  CPU_Q_ROUTING_CONTROL             0      0      0      0      0      0
 5  CPU_Q_FORUS_ADDR_RESOLUTION       0      0      0      0      0      0
 6  CPU_Q_ICMP_REDIRECT               0      0      0      0      0      0
 7  CPU_Q_INTER_FED_TRAFFIC           0      0      0      0      0      0
 8  CPU_Q_L2LVX_CONTROL_PKT           0      0      0      0      0      0
 9  CPU_Q_EWLC_CONTROL                0      0      0      0      0      0
10  CPU_Q_EWLC_DATA                   0      0      0      0      0      0
11  CPU_Q_L2LVX_DATA_PKT              0      0      0      0      0      0
12  CPU_Q_BROADCAST                   0      0      0      0      0      0
13  CPU_Q_LEARNING_CACHE_OVFL         0      0      0      0      0      0
14  CPU_Q_SW_FORWARDING               0      0      0      0      0      0
15  CPU_Q_TOPOLOGY_CONTROL            0      0      0      0      0      0
16  CPU_Q_PROTO_SNOOPING              0      0      0      0      0      0
17  CPU_Q_DHCP_SNOOPING               0      0      0      0      0      0
18  CPU_Q_TRANSIT_TRAFFIC             0      0      0      0      0      0
19  CPU_Q_RPF_FAILED                  0      0      0      0      0      0
20  CPU_Q_MCAST_END_STATION_SERVICE 0      0      0      0      0      0
21  CPU_Q_LOGGING                     0      0      0      0      0      0
22  CPU_Q_PUNT_WEBAUTH                0      0      0      0      0      0
23  CPU_Q_HIGH_RATE_APP               0      0      0      0      0      0
24  CPU_Q_EXCEPTION                   0      0      0      0      0      0
25  CPU_Q_SYSTEM_CRITICAL             0      0      0      0      0      0
26  CPU_Q_NFL_SAMPLED_DATA            0      0      0      0      0      0
27  CPU_Q_LOW_LATENCY                 0      0      0      0      0      0
28  CPU_Q_EGR_EXCEPTION               0      0      0      0      0      0
29  CPU_Q_FSS                         0      0      0      0      0      0
30  CPU_Q_MCAST_DATA                  0      0      0      0      0      0
31  CPU_Q_GOLD_PKT                    0      0      0      0      0      0

-----------------------------------------------------------------------------
```

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

Table 7: **show platform software fed switch active punt cpuq rates** Field Descriptions

Field	Description
Queue Name	Name of the queue.
Rx	The rate at which the packets are received per second in 10s, 1 minute and 5 minutes.
Drop	The rate at which the packets are dropped per second in 10s, 1 minute and 5 minutes.

show platform software fed switch punt packet-capture display

To display packet capture information during high CPU utilization, use the **show platform software fed switch active punt packet-capture display** command in privileged EXEC mode.

show platform software fed switch active punt packet-capture display { **detailed** | **hexdump**}

Syntax Description	**switch**{*switch-number*|**active**|**standby**}	Displays information about a switch. You have the following options:
		• **active** —Displays information relating to the active switch.
		• **standby**—Displays information relating to the standby switch, if available.
		Note The **standby** keyword is not supported.
	punt	Specifies punt information.
	packet-capture display	Specifies information about the captured packet.
	detailed	Specifies detailed information about the captured packet.
	hex-dump	Specifies information about the captured packet, in hex format.

Command Modes	Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The output of this command displays the periodic and persistent logs of CPU-bound packets, inband CPU traffic rates, and running CPU processes when the CPU passes a high CPU utilization threshold.

Examples   The following is a sample output from the **show platform software fed switch active punt packet-capture display detailed** command:

```
Device# show platform software fed switch active punt packet-capture display detailed
Punt packet capturing: disabled. Buffer wrapping: disabled
Total captured so far: 101 packets. Capture capacity : 4096 packets

------ Packet Number: 1, Timestamp: 2018/09/04 23:22:10.179 ------
 interface : GigabitEthernet2/0/2 [if-id: 0x00000032] (physical)
 ether hdr : dest mac: 0100.0ccc.cccd, src mac: 2c36.f8fc.4884
 ether hdr : ethertype: 0x0032

 Doppler Frame Descriptor :
```

```
     0000000044004E04  C00F402D94510000  0000000000000100  0000400401000000
     0000000001000050  000000006D000100  0000000025836200  0000000000000000

   Packet Data Dump (length: 68 bytes) :
     01000CCCCCCD2C36  F8FC48840032AAAA  0300000C010B0000  00000080012C36F8
     FC48800000000080  012C36F8FC488080  040000140002000F  0071000000020001
     244E733E

------ Packet Number: 2, Timestamp: 2018/09/04 23:22:10.179 ------
 interface : GigabitEthernet2/0/2 [if-id: 0x00000032] (physical)
 ether hdr : dest mac: 0180.c200.0000, src mac: 2c36.f8fc.4884
 ether hdr : ethertype: 0x0026
!
!
!
```

show platform software fed switch punt rates interfaces

To display the overall statistics of punt rate for all the interfaces, use the **show platform software fed switch punt rates interfaces** command in privileged EXEC mode.

show platform software fed switch {*switch-number* | **active** | **standby**} **punt rates interfaces**[**interface-id**]

Syntax Description	
switch{*switch-number*	**active**	**standby**}	Displays information about the switch. You have the following options:
	• *switch-number.*
	• **active** —Displays information relating to the active switch.
	• **standby**—Displays information relating to the standby switch, if available.
	Note This keyword is not supported.
punt	Specifies the punt informtion.
rates	Specifies the rate at which the packets are punted.
interfaces[**interface-id**]	(Optional) Displays the overall statistics for an interface and also the per-queue configuration for the interface at an interval of 10 seconds.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The output displays the punt rates in packets per second at intervals of 10 seconds, 1 minute and 5 minutes.

Example

The following is sample output from the **show platform software fed switch active punt rates interfaces** command for all the interfaces.

```
Device#show plataform software fed switch active punt rates interfaces

Punt Rate on Interfaces Statistics

Packets per second averaged over 10 seconds, 1 min and 5 mins

==========================================================================================

                              |         | Rx  | Rx   | Rx   | Drop | Drop  | Drop
        Interface Name        | IF_ID   | 10s | 1min | 5min | 10s  | 1min  | 5min
```

```
=====================================================================================
    Vlan3                          0x00000034    1000    1000    520      0       0       0
-------------------------------------------------------------------------------------
```

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

Table 8: show platform software fed switch active punt rates interfaces Field Descriptions

Field	Description
Interface Name	Name of the physical interface.
IF_ID	ID of the physical interface.
Rx	The per second rate at which the packets are received in 10s, 1 minute and 5 minutes.
Drop	The per second rate at which the packets are dropped in 10s, 1 minute and 5 minutes.

The following is sample output from the **show platform software fed switch active punt rates interfaces** *interface-id* command for a specific interface.

```
Device#show platform software fed switch active punt rates interfaces 0x31
Punt Rate on Single Interfaces Statistics

Interface : Port-channel1 [if_id: 0x31]

  Received                        Dropped
  --------                        -------
   Total         : 29617          Total          : 0
   10 sec average : 0             10 sec average  : 0
    1 min average : 0              1 min average  : 0
    5 min average : 0              5 min average  : 0

Per CPUQ punt stats on the interface (rate averaged over 10s interval)
======================================================================
Q  |        Queue              | Recv  | Recv  | Drop  | Drop  |
no |        Name               | Total | Rate  | Total | Rate  |
======================================================================
0   CPU_Q_DOT1X_AUTH                      0       0       0       0
1   CPU_Q_L2_CONTROL                  29519       0       0       0
2   CPU_Q_FORUS_TRAFFIC                   0       0       0       0
3   CPU_Q_ICMP_GEN                        0       0       0       0
4   CPU_Q_ROUTING_CONTROL                 0       0       0       0
5   CPU_Q_FORUS_ADDR_RESOLUTION           0       0       0       0
6   CPU_Q_ICMP_REDIRECT                   0       0       0       0
7   CPU_Q_INTER_FED_TRAFFIC               0       0       0       0
8   CPU_Q_L2LVX_CONTROL_PKT               0       0       0       0
9   CPU_Q_EWLC_CONTROL                    0       0       0       0
10  CPU_Q_EWLC_DATA                       0       0       0       0
11  CPU_Q_L2LVX_DATA_PKT                  0       0       0       0
12  CPU_Q_BROADCAST                       0       0       0       0
13  CPU_Q_LEARNING_CACHE_OVFL             0       0       0       0
14  CPU_Q_SW_FORWARDING                   0       0       0       0
15  CPU_Q_TOPOLOGY_CONTROL               98       0       0       0
16  CPU_Q_PROTO_SNOOPING                  0       0       0       0
17  CPU_Q_DHCP_SNOOPING                   0       0       0       0
18  CPU_Q_TRANSIT_TRAFFIC                 0       0       0       0
19  CPU_Q_RPF_FAILED                      0       0       0       0
```

```
20   CPU_Q_MCAST_END_STATION_SERVICE          0          0          0          0
21   CPU_Q_LOGGING                            0          0          0          0
22   CPU_Q_PUNT_WEBAUTH                        0          0          0          0
23   CPU_Q_HIGH_RATE_APP                      0          0          0          0
24   CPU_Q_EXCEPTION                          0          0          0          0
25   CPU_Q_SYSTEM_CRITICAL                    0          0          0          0
26   CPU_Q_NFL_SAMPLED_DATA                   0          0          0          0
27   CPU_Q_LOW_LATENCY                        0          0          0          0
28   CPU_Q_EGR_EXCEPTION                      0          0          0          0
29   CPU_Q_FSS                                0          0          0          0
30   CPU_Q_MCAST_DATA                         0          0          0          0
31   CPU_Q_GOLD_PKT                           0          0          0          0


-------------------------------------------------------------------------
```

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

Table 9: show platform software fed switch punt rates interfaces *interface-id Field Descriptions*

Field	Description
Queue Name	Name of the queue.
Recv Total	Total number of packets received.
Recv Rate	Per second rate at which the packets are received.
Drop Total	Total number of packets dropped.
Drop Rate	Per second rate at which the packets are dropped.

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		
details		Displays inline power details for all the interfaces.
port		Displays inline power port configuration.
GigabitEthernet *interface-number*		The GigabitEthernet interface number. Values range from 0 to 9.
system *slot-number*		Displays inline power system configuration.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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 memory

To display memory information for a specified switch, use the **show platform software memory** command in privileged EXEC mode.

show platform software memory [{**chunk** | **database** | **messaging**}] *process slot*

Syntax Description

Syntax Description	
chunk	(Optional) Displays chunk memory information for the specified process.
database	(Optional) Displays database memory information for the specified process.
messaging	(Optional) Displays messaging memory information for the specified process.
	The information displayed is for internal debugging purposes only.

process

Level that is being set. Options include:

- **bt-logger**—The Binary-Tracing Logger process.

- **btrace-manager**—The Btrace Manager process.

- **chassis-manager**—The Chassis Manager process.

- **cli-agent**—The CLI Agent process.

- **cmm**—The CMM process.

- **dbm**—The Database Manager process.

- **dmiauthd**—The DMI Authentication Daemon process.

- **emd**—The Environmental Monitoring process.

- **fed**—The Forwarding Engine Driver process.

- **forwarding-manager**—The Forwarding Manager process.

- **geo**—The Geo Manager process.

- **gnmi**—The GNMI process.

- **host-manager**—The Host Manager process.

- **interface-manager**—The Interface Manager process.

- **iomd**—The Input/Output Module daemon (IOMd) process.

- **ios**—The IOS process.

- **iox-manager**—The IOx Manager process.

- **license-manager**—The License Manager process.

- **logger**—The Logging Manager process.

- **mdt-pubd**—The Model Defined Telemetry Publisher process.

- **ndbman**—The Netconf DataBase Manager process.

- **nesd**—The Network Element Synchronizer Daemon process.

- **nginx**—The Nginx Webserver process.

- **nif_mgr**—The NIF Manager process.

- **platform-mgr**—The Platform Manager process.

- **pluggable-services**—The Pluggable Services process.

- **replication-mgr**—The Replication Manager process.

- **shell-manager**—The Shell Manager process.

- **sif**—The Stack Interface (SIF) Manager process.

- **smd**—The Session Manager process.

- **stack-mgr**—The Stack Manager process.

- **syncfd**—The SyncmDaemon process.

- **table-manager**—The Table Manager Server.

- **thread-test**—The Multithread Manager process.

- **virt-manager**—The Virtualization Manager process.

slot	Hardware slot where the process for which the level is set, is running. Options include:
	• *number*—Number of the SIP slot of the hardware module where the level is set. For instance, if you want to specify the SIP in SIP slot 2 of the switch, enter 2.
	• *SIP-slot / SPA-bay*—Number of the SIP switch slot and the number of the shared port adapter (SPA) bay of that SIP. For instance, if you want to specify the SPA in bay 2 of the SIP in switch slot 3, enter 3/2.
	• **F0**—The Embedded Service Processor slot 0.
	• **FP active**—The active Embedded Service Processor.
	• **R0**—The route processor in slot 0.
	• **RP active**—The active route processor.
	• **RP standby**—The standby route processor.
	• **switch** *<number>* —The switch, with its number specified.
	• **switch active**—The active switch.
	• **switch standby**—The standby switch.
	• *number*—Number of the SIP slot of the hardware module where the level is set. For instance, if you want to specify the SIP in SIP slot 2 of the switch, enter 2.
	• *SIP-slot / SPA-bay*—Number of the SIP switch slot and the number of the shared port adapter (SPA) bay of that SIP. For instance, if you want to specify the SPA in bay 2 of the SIP in switch slot 3, enter 3/2.
	• **F0**—The Embedded Service Processor in slot 0.
	• **FP active**—The active Embedded Service Processor.
	• **R0**—The route processor in slot 0.
	• **RP active**—The active route processor.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC (#)

The following is a sample output displaying the abbreviated (brief keyword) memory information
for the Forwarding Manager process for Cisco Catalyst 9000 Series ESP slot 0:

```
Device# show platform software memory forwarding-manager switch 1 fp active brief

  module                allocated      requested      allocs         frees
  -----------------------------------------------------------------------------
  Summary               5702540        5619788        121888         116716
  AOM object            1920374        1920310        4              0
  AOM links array       880379         880315         4              0
  smc_message           819575         819511         4              0
  AOM update state      640380         640316         4              0
  dpidb-config          208776         203544         351            24
  fman-infra-avl        178016         153680         1521           0
  AOM batch             152373         152309         4              0
  AOM asynchronous conte 128388        128324         4              0
  AOM basic data        124824         124760         5              1
  eventutil             118939         118299         50             10
  AOM tree node         96465          96385          5              0
  AOM tree root         72377          72313          4              0
  acl                   36090          31914          504            243
  fman-infra-ipc        35326          24366          115097         114412
  AOM uplink update node 32386         32322          4              0
  unknown               30528          23808          424            4
  uipeer                27232          27152          5              0
  fman-infra-qos        26872          24712          164            29
  cce-class             19427          15411          251            0
  l2 control protocol   15472          12896          325            164
  fman-infra-cce        15272          13576          106            0
  smc_channel           15223          15159          4              0
  unknown               14208          8736           447            105
  chunk                 12513          12033          33             3
  cce-bind              8496           7552           82             23
  MATM mac entry        8040           5928           544            412
  adj                   7064           6312           157            110
  route-pfx             6116           5412           157            113
  Filter_rules          4912           4896           1              0
  fman-infra-dpidb      4130           2338           112            0
  SMC Buffer            3794           3202           43             6
  urpf-list             3028           2100           85             27
  lookup                2480           2160           30             10
  MATM mac table        2432           1600           148            96
  cdllib                1688           1672           1              0
  route-tbl             1600           1264           21             0
  FNF Flowdef           1492           1460           3              1
  acl-ref               1120           1024           8              2
  cgm-lib               1120           880            410            395
  pbr_if_cfg            1088           976            205            198
  FNF Monitor           1048           1032           1              0
  pbr_routemap          960            864            18             12
!
!
!
```

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

Table 10: show platform software memory brief Field Descriptions

Field	Description
module	Name of submodule.
allocated	Memory, allocated in bytes.
requested	Number of bytes requested by application.
allocs	Number of discrete allocation event attempts.
frees	Number of free events.

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 *switch-number*	Displays information about the switch. Valid values for *switch-number* 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 *process-name*	(Optional) Displays information about the specified process. Enter the process name.
process-id *process-ID*	(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
Cisco IOS XE Fuji 16.9.2	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
-----------------------------------------------------------------------------
```

```
systemd                   1      0      1  S           20  4876
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
watchdog/0               10      2      0  S   4294967196  0
watchdog/1               11      2      0  S   4294967196  0
migration/1              12      2      0  S   4294967196  0
ksoftirqd/1              13      2      0  S           20  0
kworker/1:0H             15      2      0  S            0  0
watchdog/2               16      2      0  S   4294967196  0
migration/2              17      2      0  S   4294967196  0
ksoftirqd/2              18      2      0  S           20  0
kworker/2:0H             20      2      0  S            0  0
watchdog/3               21      2      0  S   4294967196  0
migration/3              22      2      0  S   4294967196  0
ksoftirqd/3              23      2      0  S           20  0
kworker/3:0              24      2      0  S           20  0
kworker/3:0H             25      2      0  S            0  0
kdevtmpfs                26      2      0  S           20  0
netns                    27      2      0  S            0  0
perf                     28      2      0  S            0  0
khungtaskd               29      2      0  S           20  0
writeback                30      2      0  S            0  0
ksmd                     31      2      0  S           25  0
khugepaged               32      2      0  S           39  0
crypto                   33      2      0  S            0  0
bioset                   34      2      0  S            0  0
kblockd                  35      2      0  S            0  0
ata_sff                  36      2      0  S            0  0
rpciod                   37      2      0  S            0  0
kswapd0                  63      2      0  S           20  0
vmstat                   64      2      0  S            0  0
fsnotify_mark            65      2      0  S           20  0
nfsiod                   66      2      0  S            0  0
.
.
.
```

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

Table 11: 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 memory

To display the amount of memory used by each system process, use the **show platform software process memory** command in privileged EXEC mode.

show platform process memory
switch { *switch-number* | **active** | **standby** } { **0** | **F0** | **FP** | **R0** } { **all** [**sorted** | **virtual** [**sorted**]] | **name** *process-name* { **maps** | **smaps** [**summary**] } | **process-id** *process-id* { **maps** | **smaps** [**summary**] } }

Syntax Description

switch *switch-number*	Displays information about the switch. Enter the switch number.
active	Specifies the active instance of the device.
standby	Specifies the standby instance of the device.
0	Specifies the Shared Port Adapter (SPA) Interface Processor slot 0.
F0	Specifies the Embedded Service Processor (ESP) slot 0.
FP	Specifies the Embedded Service Processor (ESP).
R0	Specifies the Route Processor (RP) slot 0.
all	Lists all processes.
sorted	(Optional) Sorts the output based on Resident Set Size (RSS).
virtual	(Optional) Specifies virtual memory.
name *process-name*	Specifies a process name.
maps	Specifies the memory maps of a process.
smaps summary	Specifies the smaps summary of a process.
process-id *process-id*	Specifies a process identifier.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Command Modes Privileged EXEC(#)

Examples:

The following is a sample output from the **show platform software process memory active R0 all** command:

```
Device# show platform software process memory switch active R0 all

     Pid      RSS       PSS      Heap    Shared   Private              Name
    ----------------------------------------------------------------------
       1     4876      3229      1064      1808      3068            systemd
     118     3184      1327       132      2352       832    systemd-journal
     159     3008      1191       396      1996      1012      systemd-udevd
     407     3192      1262       132      2196       996         dbus-daemon
    3406     4772      3064       264      1940      2832            virtlogd
    3411     5712      3474      2964      2344      3368         droputil.sh
    3416     2588       358       132      2336       252          libvirtd.sh
    3420     5708      3484      2976      2308      3400         reflector.sh
    3424     1804       263       132      1632       172             xinetd
    3425      964       118       132       872        92              sleep
    3434     3060       844       528      2304       756             oom.sh
    3442     2068       606       132      1604       464            rpcbind
    3485     2380       845       132      1636       744          rpc.statd
    3486     1632       338       132      1348       284     boothelper_evt.
    3493     1136       156       132      1004       132         inotifywait
    3504     2048       753       132      1372       676          rpc.mountd
    3584     2868       620        36      2384       484              rotee
    3649     1032       116       132       944        88              sleep
    3705     2784       613        36      2296       488              rotee
    3718     2856       610        36      2376       480              rotee
    3759     1292       184       132      1136       156         inotifywait
    3787     4256      2040      1640      2300      1956            iptbl.sh
    3894     2948       637        36      2460       488              rotee
    4017     1380       175       132      1236       144         inotifywait
    4866     1820       287       132      1624       196             xinetd
    5887     1692       257       132      1508       184             xinetd
    5891     7248      4984      4584      2348      4900     rollback_timer.
    5893     1764       257       132      1588       176             xinetd
    6031     2804       601        36      2332       472              rotee
    6037     1228       163       132      1092       136         inotifywait
    6077     4736      3389      2992      1368      3368            psvp.sh
    6115     1620       476        36      1152       468              rotee
    6122      624       149       132       480       144         inotifywait
    6127     5440      4077      3680      1384      4056             pvp.sh
    6165     1736       592        36      1152       584              rotee
    6245      624       149       132       480       144         inotifywait
    6353     2592      1260       924      1352      1240            pman.sh
    6470     1632       488        36      1152       480              rotee
    6499     2588      1262       924      1348      1240            pman.sh
    6666     1640       496        36      1152       488              rotee
    6718     2584      1258       800      1348      1236            pman.sh
    6736     8360      7020      6640      1360      7000     auto_upgrade_cl
    6909     1636       492        36      1152       484              rotee
    6955     2588      1262       928      1348      1240            pman.sh
    7029     2196       679        40      1552       644     auto_upgrade_se
    7149     1636       492        36      1152       484              rotee
    7224    13200      4595        48      9368      3832          bt_logger
    7295     2588      1262       800      1348      1240            pman.sh
.
.
.
```

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

Table 12: show platform software process memory Field Descriptions

Field	Description
PID	Displays the process ID that is used by the operating system to identify and keep track of the processes.
RSS	Displays the Resident Set Size (in kilobytes (KB)) that shows how much memory is allocated to that process in the RAM.
PSS	Displays the Proportional Set Size of a process. This is the count of pages it has in memory, where each page is divided by the number of processes sharing it.
Heap	Displays where all user-allocated memory is located.
Shared	Shared clean + Shared dirty
Private	Private clean + Private dirty
Name	Displays the command name associated with the process. Different threads in the same process may have different command values.

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	
switch-number	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.
cycles *no-of-tmes*	(Optional) Sets the number of times to run monitor command. Valid values are from 1 to 4294967295. The default is 5.
interval *delay*	(Optional) Sets a delay after each . Valid values are from 0 to 300. The default is 3.
lines *number*	(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
Cisco IOS XE Fuji 16.9.2	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 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_iosd-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
Cisco IOS XE Fuji 16.9.2	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:

```
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
          3   5.80   1.20   0.00  93.00   0.00   0.00   0.00
4-RP0     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
          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
9-RP0     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
          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 platform software thread list

To display the list of threads on a platform, use the **show platform software thread list** command in privileged EXEC mode.

show platform software thread list switch { *switch-number* | **active** | **standby** } { **0** | **F0** | **FP active** | **R0** } **pname** { **cdman** | **vidman** | **all** } **tname** { **main** | **pktio** | **rt** | **all** }

Syntax Description

switch *switch-number*	Displays information about the switch. Enter the switch number.
active	Specifies the active instance of the device.
standby	Specifies standby instance of the device.
0	Specifies the Shared Port Adapter (SPA) Interface Processor slot 0.
F0	Specifies the Embedded Service Processor (ESP) slot 0.
FP active	Specifies the active instance of Embedded Service Processor (ESP).
R0	Specifies the Route Processor (RP) slot 0.
pname	Specifies a process name. The possible values are **cdman**, **vidman**, and **all**.
tname	Specifies a thread name. The possible values are **main**, **pktio**, **rt**, and **all**.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Command Modes   Privileged EXEC(#)

Examples:

The following is sample output from the **show platform software thread list switch active R0 pname cdman tname all** command:

```
Device# show platform software thread list switch active R0 pname cdman tname all

Name            Tid    PPid  Group Id  Core   Vcswch   Nvcswch  Status     Priority
TIME+  Size
--------------------------------------------------------------------------------------------
cdman          8407   7295     8407    1        0        0 S                20
12309  36976
```

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

Table 13: show platform software thread 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.
Tid	Displays the process ID.
PPid	Displays the process ID of the parent process.
Group Id	Displays the group ID.
Core	Displays processor information.
Vcswch	Displays the number of voluntary context switches.
Nvcswch	Displays the number of non-voluntary context switches.
Status	Displays the process status in human readable form.
Priority	Displays the negated scheduling priority.
TIME+	Displays the time since the start of the process.
Size	Displays the Resident Set Size (in kilobytes (KB)) that shows how much memory is allocated to that process in the RAM.

show processes cpu platform

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

show processes cpu platform [[**sorted** [**1min** | **5min** | **5sec**]] **location switch** { *switch-number* | **active** | **standby** } { **F0** | **FP active** | **R0** | **RP active** }]

Syntax Description		
sorted	(Optional) Displays output sorted based on percentage of CPU usage on a platform.	
1min	(Optional) Sorts based on 1 minute intervals.	
5min	(Optional) Sorts based on 5 minute intervals.	
5sec	(Optional) Sorts based on 5 second intervals.	
location	Specifies the Field Replaceable Unit (FRU) location.	
switch *switch-number*	Displays information about the switch. Enter the switch number.	
active	Specifies the active instance of the device.	
standby	Specifies the standby instance of the device.	
F0	Specifies the Embedded Service Processor (ESP) slot 0.	
FP active	Specifies active instances on the Embedded Service Processor (ESP).	
R0	Specifies the Route Processor (RP) slot 0.	
RP active	Specifies active instances on the Route Processor (RP).	

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Command Modes Privileged EXEC (#)

Examples:

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

```
Device# show processes cpu platform

CPU utilization for five seconds: 1%, one minute:  3%, five minutes:  2%
Core 0: CPU utilization for five seconds:  2%, one minute:  2%, five minutes:  2%
Core 1: CPU utilization for five seconds:  2%, one minute:  1%, five minutes:  1%
Core 2: CPU utilization for five seconds:  3%, one minute:  1%, five minutes:  1%
Core 3: CPU utilization for five seconds:  2%, one minute:  5%, five minutes:  2%
   Pid   PPid   5Sec   1Min   5Min  Status       Size  Name
--------------------------------------------------------------------------
     1      0     0%     0%     0%  S            4876  systemd
```

```
     2      0     0%      0%      0%  S              0  kthreadd
     3      2     0%      0%      0%  S              0  ksoftirqd/0
     5      2     0%      0%      0%  S              0  kworker/0:0H
     7      2     0%      0%      0%  S              0  rcu_sched
     8      2     0%      0%      0%  S              0  rcu_bh
     9      2     0%      0%      0%  S              0  migration/0
    10      2     0%      0%      0%  S              0  watchdog/0
    11      2     0%      0%      0%  S              0  watchdog/1
    12      2     0%      0%      0%  S              0  migration/1
    13      2     0%      0%      0%  S              0  ksoftirqd/1
    15      2     0%      0%      0%  S              0  kworker/1:0H
    16      2     0%      0%      0%  S              0  watchdog/2
    17      2     0%      0%      0%  S              0  migration/2
    18      2     0%      0%      0%  S              0  ksoftirqd/2
    20      2     0%      0%      0%  S              0  kworker/2:0H
    21      2     0%      0%      0%  S              0  watchdog/3
    22      2     0%      0%      0%  S              0  migration/3
    23      2     0%      0%      0%  S              0  ksoftirqd/3
    24      2     0%      0%      0%  S              0  kworker/3:0
    25      2     0%      0%      0%  S              0  kworker/3:0H
    26      2     0%      0%      0%  S              0  kdevtmpfs
    27      2     0%      0%      0%  S              0  netns
    28      2     0%      0%      0%  S              0  perf
    29      2     0%      0%      0%  S              0  khungtaskd
    30      2     0%      0%      0%  S              0  writeback
    31      2     7%      8%      8%  S              0  ksmd
    32      2     0%      0%      0%  S              0  khugepaged
    33      2     0%      0%      0%  S              0  crypto
    34      2     0%      0%      0%  S              0  bioset
    35      2     0%      0%      0%  S              0  kblockd
    36      2     0%      0%      0%  S              0  ata_sff
    37      2     0%      0%      0%  S              0  rpciod
    63      2     0%      0%      0%  S              0  kswapd0
    64      2     0%      0%      0%  S              0  vmstat
    65      2     0%      0%      0%  S              0  fsnotify_mark
     .
     .
     .
```

The following is sample output from the **show processes cpu platform sorted 5min location switch 5 R0**

```
Device# show processes cpu platform sorted 5min location switch 5 R0

CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  0%
Core 0: CPU utilization for five seconds: 1%, one minute: 1%, five minutes: 1%
Core 1: CPU utilization for five seconds: 1%, one minute: 1%, five minutes: 1%
Core 2: CPU utilization for five seconds: 1%, one minute: 1%, five minutes: 1%
Core 3: CPU utilization for five seconds: 2%, one minute: 2%, five minutes: 1%
Core 4: CPU utilization for five seconds: 0%, one minute: 0%, five minutes: 0%
Core 5: CPU utilization for five seconds: 0%, one minute: 0%, five minutes: 0%
Core 6: CPU utilization for five seconds: 0%, one minute: 0%, five minutes: 0%
Core 7: CPU utilization for five seconds: 0%, one minute: 0%, five minutes: 0%
   Pid    PPid    5Sec    1Min    5Min  Status      Size  Name
--------------------------------------------------------------------------------
  16358   15516     4%      4%      4%  S          221376  fed main event
  14062   12756     1%      1%      1%  S           52140  sif_mgr
  32105    8618     0%      0%      0%  S             260  inotifywait
  31396   31393     0%      0%      0%  S           36516  python2.7
  31393   31271     0%      0%      0%  S            2744  rdope.sh
  31319       1     0%      0%      0%  S            2648  rotee
  31271       1     0%      0%      0%  S            3852  pman.sh
  29671       2     0%      0%      0%  S               0  kworker/u16:0
  29341   29329     0%      0%      0%  S            1780  sntp
  29329       1     0%      0%      0%  S            2788  stack_sntp.sh
     .
```

.
.

The following is sample output from the **show processes cpu platform location switch 7 R0** command:

```
Device# show processes cpu platform location switch 7 R0

CPU utilization for five seconds:  3%, one minute:  3%, five minutes:  3%
Core 0: CPU utilization for five seconds:  1%, one minute:  5%, five minutes:  5%
Core 1: CPU utilization for five seconds:  1%, one minute: 11%, five minutes:  5%
Core 2: CPU utilization for five seconds: 22%, one minute:  7%, five minutes:  6%
Core 3: CPU utilization for five seconds:  5%, one minute:  6%, five minutes:  6%
Core 4: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  0%
Core 5: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  0%
Core 6: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  0%
Core 7: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  6%
   Pid    PPid    5Sec    1Min    5Min  Status       Size  Name
--------------------------------------------------------------------------
     1       0      0%      0%      0%  S            8044  systemd
     2       0      0%      0%      0%  S               0  kthreadd
.
.
.
```

show processes cpu platform history

To display information about the CPU usage history of a system, use the **show processes cpu platform history** command.

show processes cpu platform history [**1min** | **5min** | **5sec** | **60min**] **location**
switch {*switch-number* | **active** | **standby**} {**0** | **F0** | **FP active** | **R0**}

1min	(Optional) Displays CPU utilization history with 1 minute intervals.
5min	(Optional) Displays CPU utilization history with 5 minute intervals.
5sec	(Optional) Displays CPU utilization history with 5 second intervals.
60min	(Optional) Displays CPU utilization history with 60 minute intervals.
location	Specifies the Field Replaceable Unit (FRU) location.
switch *switch-number*	Displays information about the switch. Enter the switch number.
active	Specifies the active instance of the device.
standby	Specifies the standby instance of the device.
0	Specifies the Shared Port Adapter (SPA) Interface Processor slot 0.
F0	Specifies the Embedded Service Processor (ESP) slot 0.
FP active	Specifies active instances on the Embedded Service Processor (ESP).
R0	Specifies the Route Processor (RP) slot 0.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Command Modes Privileged EXEC (#)

Examples:

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

```
Device# show processes cpu platform
```

```
CPU utilization for five seconds:  1%, one minute:  3%, five minutes:  2%
Core 0: CPU utilization for five seconds:  2%, one minute:  2%, five minutes:  2%
Core 1: CPU utilization for five seconds:  2%, one minute:  1%, five minutes:  1%
Core 2: CPU utilization for five seconds:  3%, one minute:  1%, five minutes:  1%
Core 3: CPU utilization for five seconds:  2%, one minute:  5%, five minutes:  2%
   Pid   PPid    5Sec    1Min    5Min  Status       Size  Name
--------------------------------------------------------------------------------
     1      0      0%      0%      0%  S            4876  systemd
     2      0      0%      0%      0%  S               0  kthreadd
     3      2      0%      0%      0%  S               0  ksoftirqd/0
     5      2      0%      0%      0%  S               0  kworker/0:0H
     7      2      0%      0%      0%  S               0  rcu_sched
     8      2      0%      0%      0%  S               0  rcu_bh
     9      2      0%      0%      0%  S               0  migration/0
    10      2      0%      0%      0%  S               0  watchdog/0
    11      2      0%      0%      0%  S               0  watchdog/1
    12      2      0%      0%      0%  S               0  migration/1
    13      2      0%      0%      0%  S               0  ksoftirqd/1
    15      2      0%      0%      0%  S               0  kworker/1:0H
    16      2      0%      0%      0%  S               0  watchdog/2
    17      2      0%      0%      0%  S               0  migration/2
    18      2      0%      0%      0%  S               0  ksoftirqd/2
    20      2      0%      0%      0%  S               0  kworker/2:0H
    21      2      0%      0%      0%  S               0  watchdog/3
    22      2      0%      0%      0%  S               0  migration/3
    23      2      0%      0%      0%  S               0  ksoftirqd/3
    24      2      0%      0%      0%  S               0  kworker/3:0
    25      2      0%      0%      0%  S               0  kworker/3:0H
    26      2      0%      0%      0%  S               0  kdevtmpfs
    27      2      0%      0%      0%  S               0  netns
    28      2      0%      0%      0%  S               0  perf
    29      2      0%      0%      0%  S               0  khungtaskd
    30      2      0%      0%      0%  S               0  writeback
    31      2      7%      8%      8%  S               0  ksmd
    32      2      0%      0%      0%  S               0  khugepaged
    33      2      0%      0%      0%  S               0  crypto
    34      2      0%      0%      0%  S               0  bioset
    35      2      0%      0%      0%  S               0  kblockd
    36      2      0%      0%      0%  S               0  ata_sff
    37      2      0%      0%      0%  S               0  rpciod
    63      2      0%      0%      0%  S               0  kswapd0
    64      2      0%      0%      0%  S               0  vmstat
    65      2      0%      0%      0%  S               0  fsnotify_mark
.
.
.
```

The following is sample output from the **show processes cpu platform history 5sec** command:

```
Device# show processes cpu platform history 5sec

5 seconds ago, CPU utilization: 0%
10 seconds ago, CPU utilization: 0%
15 seconds ago, CPU utilization: 0%
20 seconds ago, CPU utilization: 0%
25 seconds ago, CPU utilization: 0%
30 seconds ago, CPU utilization: 0%
35 seconds ago, CPU utilization: 0%
40 seconds ago, CPU utilization: 0%
45 seconds ago, CPU utilization: 0%
50 seconds ago, CPU utilization: 0%
55 seconds ago, CPU utilization: 0%
60 seconds ago, CPU utilization: 0%
65 seconds ago, CPU utilization: 0%
70 seconds ago, CPU utilization: 0%
```

```
75 seconds ago, CPU utilization: 0%
80 seconds ago, CPU utilization: 0%
85 seconds ago, CPU utilization: 0%
90 seconds ago, CPU utilization: 0%
95 seconds ago, CPU utilization: 0%
100 seconds ago, CPU utilization: 0%
105 seconds ago, CPU utilization: 0%
110 seconds ago, CPU utilization: 0%
115 seconds ago, CPU utilization: 0%
120 seconds ago, CPU utilization: 0%
125 seconds ago, CPU utilization: 0%
130 seconds ago, CPU utilization: 0%
135 seconds ago, CPU utilization: 0%
140 seconds ago, CPU utilization: 0%
145 seconds ago, CPU utilization: 1%
150 seconds ago, CPU utilization: 0%
155 seconds ago, CPU utilization: 0%
160 seconds ago, CPU utilization: 0%
165 seconds ago, CPU utilization: 0%
170 seconds ago, CPU utilization: 0%
175 seconds ago, CPU utilization: 0%
180 seconds ago, CPU utilization: 0%
185 seconds ago, CPU utilization: 0%
190 seconds ago, CPU utilization: 0%
195 seconds ago, CPU utilization: 0%
200 seconds ago, CPU utilization: 0%
205 seconds ago, CPU utilization: 0%
210 seconds ago, CPU utilization: 0%
215 seconds ago, CPU utilization: 0%
220 seconds ago, CPU utilization: 0%
225 seconds ago, CPU utilization: 0%
230 seconds ago, CPU utilization: 0%
235 seconds ago, CPU utilization: 0%
240 seconds ago, CPU utilization: 0%
245 seconds ago, CPU utilization: 0%
250 seconds ago, CPU utilization: 0%
.
.
.
```

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.
switch-number	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
Cisco IOS XE Fuji 16.9.2	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   0:00.07 top
17546 root      20   0 2044m 244m  79m S    7  6.3 187:02.07 fed main event
30276 root      20   0  171m  42m  33m S    7  1.1 125:15.54 repm
   16 root      20   0     0    0    0 S    5  0.0  22:07.92 rcuc/2
   21 root      20   0     0    0    0 R    5  0.0  22:13.24 rcuc/3
```

```
18662 root      20   0 1806m 678m 263m R   5 17.5 215:47.59 linux_iosd-imag
   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

To display the amount of memory used by each system process, use the **show processes memory** command in privileged EXEC mode.

show **processes** **memory** [{ *process-id* | **sorted** [{ **allocated** | **getbufs** | **holding** }] }]

Syntax Description	*process-id*	(Optional) Process ID (PID) of a specific process. When you specify a process ID, only details for the specified process will be shown.
	sorted	(Optional) Displays memory data sorted by the Allocated, Get Buffers, or Holding column. If the **sorted** keyword is used by itself, data is sorted by the Holding column by default.
	allocated	(Optional) Displays memory data sorted by the Allocated column.
	getbufs	(Optional) Displays memory data sorted by the Getbufs (Get Buffers) column.
	holding	(Optional) Displays memory data sorted by the Holding column. This keyword is the default.

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   The **show processes memory** command and the **show processes memory sorted** command displays a summary of total, used, and free memory, followed by a list of processes and their memory impact.

If the standard **show processes memory** *process-id* command is used, processes are sorted by their PID. If the **show processes memory sorted** command is used, the default sorting is by the Holding value.

✎

Note   Holding memory of a particular process can be allocated by other processes also, and so it can be greater than the allocated memory.

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

```
Device# show processes memory

Processor Pool Total:   25954228 Used:    8368640 Free:   17585588
 PID TTY  Allocated      Freed      Holding     Getbufs    Retbufs Process
   0   0   8629528     689900      6751716           0          0 *Init*
   0   0     24048      12928        24048           0          0 *Sched*
   0   0       260        328           68      350080          0 *Dead*
   1   0         0          0        12928           0          0 Chunk Manager
   2   0       192        192         6928           0          0 Load Meter
   3   0    214664        304       227288           0          0 Exec
   4   0         0          0        12928           0          0 Check heaps
   5   0         0          0        12928           0          0 Pool Manager
   6   0       192        192        12928           0          0 Timers
   7   0       192        192        12928           0          0 Serial Backgroun
```

```
     8   0         192        192       12928           0            0 AAA high-capacit
     9   0           0          0       24928           0            0 Policy Manager
    10   0           0          0       12928           0            0 ARP Input
    11   0         192        192       12928           0            0 DDR Timers
    12   0           0          0       12928           0            0 Entity MIB API
    13   0           0          0       12928           0            0 MPLS HC Counter
    14   0           0          0       12928           0            0 SERIAL A'detect
 .
 .
 .
    78   0           0          0       12992           0            0 DHCPD Timer
    79   0         160          0       13088           0            0 DHCPD Database
                                     8329440 Total
```

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

Table 14: show processes memory Field Descriptions

Field	Description
Processor Pool Total	Total amount of memory, in kilobytes (KB), held for the Processor memory pool.
Used	Total amount of used memory, in KB, in the Processor memory pool.
Free	Total amount of free memory, in KB, in the Processor memory pool.
PID	Process ID.
TTY	Terminal that controls the process.
Allocated	Bytes of memory allocated by the process.
Freed	Bytes of memory freed by the process, regardless of who originally allocated it.
Holding	Amount of memory, in KB, currently allocated to the process. This includes memory allocated by the process and assigned to the process.
Getbufs	Number of times the process has requested a packet buffer.
Retbufs	Number of times the process has relinquished a packet buffer.
Process	Process name.
Init	System initialization process.
Sched	The scheduler process.
Dead	Processes as a group that are now dead.
<value> Total	Total amount of memory, in KB, held by all processes (sum of the "Holding" column).

The following is sample output from the **show processes memory** command when the **sorted** keyword is used. In this case, the output is sorted by the Holding column, from largest to smallest.

```
Device# show processes memory sorted

Processor Pool Total:   25954228 Used:    8371280 Free:   17582948
 PID TTY   Allocated      Freed     Holding    Getbufs    Retbufs Process
   0   0     8629528     689900     6751716          0          0 *Init*
```

```
    3   0     217304       304    229928            0            0 Exec
   53   0     109248       192     96064            0            0 DHCPD Receive
   56   0          0         0     32928            0            0 COPS
   19   0      39048         0     25192            0            0 Net Background
   42   0          0         0     24960            0            0 L2X Data Daemon
   58   0        192       192     24928            0            0 X.25 Background
   43   0        192       192     24928            0            0 PPP IP Route
   49   0          0         0     24928            0            0 TCP Protocols
   48   0          0         0     24928            0            0 TCP Timer
   17   0        192       192     24928            0            0 XML Proxy Client
    9   0          0         0     24928            0            0 Policy Manager
   40   0          0         0     24928            0            0 L2X SSS manager
   29   0          0         0     24928            0            0 IP Input
   44   0        192       192     24928            0            0 PPP IPCP
   32   0        192       192     24928            0            0 PPP Hooks
   34   0          0         0     24928            0            0 SSS Manager
   41   0        192       192     24928            0            0 L2TP mgmt daemon
   16   0        192       192     24928            0            0 Dialer event
   35   0          0         0     24928            0            0 SSS Test Client
--More--
```

The following is sample output from the **show processes memory** command when a process ID (*process-id*) is specified:

```
Device# show processes memory 1

Process ID: 1
Process Name: Chunk Manager
Total Memory Held: 8428 bytes
Processor memory holding = 8428 bytes
pc = 0x60790654, size =      6044, count =    1
pc = 0x607A5084, size =      1544, count =    1
pc = 0x6076DBC4, size =       652, count =    1
pc = 0x6076FF18, size =       188, count =    1
I/O memory holding = 0 bytes


Device# show processes memory 2

Process ID: 2
Process Name: Load Meter
Total Memory Held: 3884 bytes
Processor memory holding = 3884 bytes
pc = 0x60790654, size =      3044, count =    1
pc = 0x6076DBC4, size =       652, count =    1
pc = 0x6076FF18, size =       188, count =    1
I/O memory holding = 0 bytes
```

Related Commands	Command	Description
	show memory	Displays statistics about memory, including memory-free pool statistics.
	show processes	Displays information about the active processes.

show processes memory platform

To display memory usage for each 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** } | **accounting**]

Syntax Description		
accounting		(Optional) Displays the top memory allocators for each Cisco IOS XE process.
detailed		(Optional) Displays detailed memory information for a specified Cisco IOS XE process.
name *process-name*		(Optional) Displays the Cisco IOS XE process name. Enter the process name.
process-id *process-ID*		(Optional) Displayss the Cisco IOS XE process ID. Enter the process ID.
location		(Optional) Displays information about the Field Replaceable Unit (FRU) location.
maps		(Optional) Displays memory maps of a process.
smaps		(Optional) Displays static memory maps of a process.
sorted		(Optional) Displays the sorted output based on the Resident Set Size (RSS) memory used by Cisco IOS XE process.
switch *switch-number*		Displays information about the device.
active		Displays information about the active instance of the device.
standby		Displays information about the standby instance of the device.
0		Displays information about Shared Port Adapter (SPA)-Inter-Processor slot 0.
F0		Displays information about Embedded Service Processor (ESP) slot 0.
R0		Displays information about Route Processor (RP) slot 0.

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.
	Cisco IOS XE Gibraltar 16.10.1	This command was modified. The keyword **accounting** was added.
		The **Total** column was deleted from the output.

Examples

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

```
device# show processes memory platform

System memory: 3976852K total, 2761580K used, 1215272K free,
Lowest: 1215272K
    Pid     Text     Data    Stack   Dynamic      RSS              Name
-------------------------------------------------------------------------
      1     1246     4400      132      1308     4400           systemd
     96      233     2796      132       132     2796    systemd-journal
    105      284     1796      132       176     1796      systemd-udevd
    707       52     2660      132       172     2660         in.telnetd
    744      968     3264      132      1700     3264          brelay.sh
    835       52     2660      132       172     2660         in.telnetd
    863      968     3264      132      1700     3264          brelay.sh
    928      968     3996      132      2312     3996       reflector.sh
    933      968     3976      132      2312     3976        droputil.sh
    934      968     2140      132       528     2140             oom.sh
    936      173      936      132       132      936             xinetd
    945      968     1472      132       132     1472        libvirtd.sh
    947      592    43164      132      3096    43164               repm
    954       45      932      132       132      932            rpcbind
    986      482     3476      132       132     3476            libvirtd
    988       66      940      132       132      940          rpc.statd
    993      968      928      132       132      928    boothelper_evt.
   1017       21      640      132       132      640         inotifywait
   1089      102     1200      132       132     1200          rpc.mountd
   1328        9     2940      132       148     2940              rotee
   1353       39      532      132       132      532              sleep
!
!
!
```

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

```
device# show processes memory platform accounting
Hourly Stats

  process               callsite_ID(bytes)  max_diff_bytes   callsite_ID(calls)
max_diff_calls   tracekey                                 timestamp(UTC)

_____

  smand_rp_0              3624155137          172389           3624155138          50
          1#a3e0e4361082c702e5bf1afbd90e6313      2018-09-04 14:23
  linux_iosd-imag_rp_0    3626295305           49188           3624155138          12
          1#545420bd869d25eb5ab826182ee5d9ce      2018-09-04 12:03
  btman_rp_0              3624737792           17080           2953915394          64
          1#d6888bd9564a3c4fcf049c31ba07a036      2018-09-04 22:29
```

```
    fman_fp_image_fp_0      3624059905              16960              4027402242              298
            1#921ba4d9df5b0a6e946a3b270bd6592d      2018-09-04 22:55
    fed_main_event_fp_0     3626295305              16396              4027402242              32
            1#27083f7bf3985d892505806cae2bfb0d      2018-09-04 12:03
    dbm_rp_0                3626295305              16396              4027402242              3
            1#2b878f802bd7703c5298d37e7a4e8ac3      2018-09-04 12:02
    tamd_proc_rp_0          3895208962              12632              3624667171              7
            1#5b0ed8f88ef5f873abcaf8a744037a44      2018-09-04 18:47
    btman_fp_0              3624233985              12288              3624737792              9
            1#d6888bd9564a3c4fcf049c31ba07a036      2018-09-04 15:23
    sif_mgr_rp_0            3624059907              8216               4027402242              4
            1#de2a951a8a7bae83ca2c04c56810eb72      2018-09-04 14:21
    python2.7_fp_0          2954560513              8000               2954560513              1
                                                    2018-09-04 12:16
    nginx_rp_0              3357041665              4608               4027402242              4
            1#32e56bb09e0509c5fa5ac32093631206      2018-09-04 16:18
    rotee_FRU_SLOT_NUM      3624667169              4097               3624667169              1
            1#ff68e5150a698cd59fa259828614995b      2018-09-04 10:43
    hman_rp_0               3893617664              1488               3893617664              1
            1#1c4aadada30083c5d6f66dc8ca8cd4cb      2018-09-04 10:42
    tams_proc_rp_0          3895096320              1024               3895096320              1
            1#a36a3afa9884c8dc4d40af1e80cacd26      2018-09-04 10:42
    stack_mgr_rp_0          4027402242              904                4027402242              4
            1#ca902eab11a18ab056b16554f49871e8      2018-09-04 14:21
    sessmgrd_rp_0           3491618816              848                3624155138              8
            1#720239fc8bddcabc059768c55a1640ed      2018-09-04 14:32
    psd_rp_0                4027402242              696                4027402242              4
            1#98cf04e0ddd78c2400b3ca3b5f298594      2018-09-04 14:21
    lman_rp_0               4027402242              592                4027402242              4
            1#dc8ed9e428d36477a617d56c51d5caf2      2018-09-04 14:21
    bt_logger_rp_0          4027402242              592                4027402242              4
            1#ba882be1ed783e72575e97cc0908e0e8      2018-09-04 14:21
    repm_rp_0               4027402242              592                4027402242              4
            1#ae461a05430efa767427f2ab40aba372      2018-09-04 14:21
    fman_rp_rp_0            4027402242              592                4027402242              3
            1#09def9cc1390911be9e3a7a9c89f4cf7      2018-09-04 12:16
    epc_ws_liaison_fp_0     4027402242              592                4027402242              4
            1#41451626dcce9d1478b22e2ebbbdcf54      2018-09-04 14:21
    cli_agent_rp_0          4027402242              592                4027402242              4
            1#92d3882919daf3a9e210807c61de0552      2018-09-04 14:21
    cmm_rp_0                4027402242              592                4027402242              4
            1#15ed1d79e96874b1e0621c42c3de6166      2018-09-04 14:21
    tms_rp_0                4027402242              352                4027402242              4
            1#5c6efe2e21f15aa16318576d3ec9153c      2018-09-04 12:03
    plogd_rp_0              4027402242              48                 4027402242              1
            1#2d7f2ef57206f4fa763d7f2f5400bf1b      2018-09-04 10:43
    cmand_rp_0              3624155137              17                 3624155137              1
            1#f1f41f61c44d73014023db5d8a46ecf5      2018-09-04 10:42
!
!
!
```

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

```
device# show processes memory platform sorted
System memory: 3976852K total, 2762884K used, 1213968K free,
Lowest: 1213968K

    Pid      Text      Data    Stack   Dynamic        RSS             Name
-------------------------------------------------------------------------
    7885    149848    684864    136        80      684864    linux_iosd-imag
    9655      3787    264964    136     18004      264964               wcm
```

```
    17261       324      248588      132      103908      248588       fed main event
     4268       391      102084      136        5596      102084          cli_agent
     4856       357       93388      132        3680       93388                dbm
    17067      1087       77912      136        1796       77912       platform_mgr
!
!
!
```

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

```
device# show processes memory platform sorted location switch active R0
System memory: 3976852K total, 2762884K used, 1213968K free,
Lowest: 1213968K

    Pid      Text      Data    Stack    Dynamic        RSS              Name
-------------------------------------------------------------------------
    7885    149848     684864     136          80     684864    linux_iosd-imag
    9655      3787     264964     136       18004     264964                wcm
   17261       324     248588     132      103908     248588     fed main event
    4268       391     102084     136        5596     102084          cli_agent
    4856       357      93388     132        3680      93388                dbm
   17067      1087      77912     136        1796      77912       platform_mgr
!
!
!
```

show processes platform

To display information about the IOS-XE processes running on a platform, use the **show processes platform** command in privileged EXEC mode.

show processes platform [**detailed name** *process-name*] [**location**
switch{*switch-number* | **active** | **standby**} {**0** | **F0** | **FP active** | **R0**}]

detailed	(Optional) Displays detailed information of the specified IOS-XE process.
name *process-name*	(Optional) Specifies the process name.
location	(Optional) Specifies the Field Replaceable Unit (FRU) location.
switch *switch-number*	(Optional) Displays information about the switch.
active	(Optional) Specifies the active instance of the device.
standby	(Optional) Specifies standby instance of the device.
0	Specifies the Shared Port Adapter (SPA) Interface Processor slot 0.
F0	Specifies the Embedded Service Processor (ESP) slot 0.
FP active	Specifies the active instance in the Embedded Service Processor (ESP).
R0	Specifies the Route Processor (RP) slot 0.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Command Modes   Privileged EXEC(#)

Examples:

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

```
Device# show processes platform

CPU utilization for five seconds: 1%, one minute: 2%, five minutes: 1%
   Pid    PPid  Status        Size  Name
--------------------------------------------------------
     1       0  S             4876  systemd
     2       0  S                0  kthreadd
     3       2  S                0  ksoftirqd/0
     5       2  S                0  kworker/0:0H
     7       2  S                0  rcu_sched
     8       2  S                0  rcu_bh
     9       2  S                0  migration/0
    10       2  S                0  watchdog/0
    11       2  S                0  watchdog/1
    12       2  S                0  migration/1
```

```
13      2   S              0   ksoftirqd/1
15      2   S              0   kworker/1:0H
16      2   S              0   watchdog/2
17      2   S              0   migration/2
18      2   S              0   ksoftirqd/2
20      2   S              0   kworker/2:0H
21      2   S              0   watchdog/3
22      2   S              0   migration/3
23      2   S              0   ksoftirqd/3
24      2   S              0   kworker/3:0
25      2   S              0   kworker/3:0H
26      2   S              0   kdevtmpfs
27      2   S              0   netns
28      2   S              0   perf
29      2   S              0   khungtaskd
30      2   S              0   writeback
31      2   S              0   ksmd
32      2   S              0   khugepaged
33      2   S              0   crypto
34      2   S              0   bioset
35      2   S              0   kblockd
36      2   S              0   ata_sff
37      2   S              0   rpciod
63      2   S              0   kswapd0
64      2   S              0   vmstat
65      2   S              0   fsnotify_mark
66      2   S              0   nfsiod
74      2   S              0   bioset
75      2   S              0   bioset
76      2   S              0   bioset
77      2   S              0   bioset
78      2   S              0   bioset
79      2   S              0   bioset
80      2   S              0   bioset
81      2   S              0   bioset
82      2   S              0   bioset
83      2   S              0   bioset
84      2   S              0   bioset
85      2   S              0   bioset
86      2   S              0   bioset
87      2   S              0   bioset
88      2   S              0   bioset
89      2   S              0   bioset
90      2   S              0   bioset
91      2   S              0   bioset
92      2   S              0   bioset
93      2   S              0   bioset
94      2   S              0   bioset
95      2   S              0   bioset
96      2   S              0   bioset
97      2   S              0   bioset
100     2   S              0   ipv6_addrconf
102     2   S              0   deferwq
```

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

Table 15: show processes platform Field Descriptions

Field	Description
Pid	Displays the process ID.

Field	Description
PPid	Displays the process ID of the parent process.
Status	Displays the process status in human readable form.
Size	Displays the Resident Set Size (in kilobytes (KB)) that shows how much memory is allocated to that process in the RAM.
Name	Displays the command name associated with the process. Different threads in the same process may have different command values.

show shell

To display shell information, use the **show shell** command in user EXEC mode.

show shell [{**enviornment** | **functions** [{**brief** *shell_function*}] | **triggers**}]

Syntax Description	**environment**	(Optional) Displays shell environment inform
	functions [**brief** |*shell_function*]	(Optional) Displays macro information.
		• **brief**—Names of the shell functions.
		• *shell_function*—Name of a shell functior
	triggers	(Optional) Displays event trigger information.

Command Modes
User EXEC (>)

Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines
Use this command to display the shell information for the switch.

Example

This example shows how to use the **show shell** *triggers* command to view the event triggers in the switch software:

```
Device# term shell
Device# show shell triggers
User defined triggers
--------------------
Built-in triggers
----------------
Trigger Id: CISCO_CUSTOM_EVENT
Trigger description: Custom macroevent to apply user defined configuration
Trigger environment: User can define the macro
Trigger mapping function: CISCO_CUSTOM_AUTOSMARTPORT

Trigger Id: CISCO_DMP_EVENT
Trigger description: Digital media-player device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_DMP_AUTO_SMARTPORT

Trigger Id: CISCO_IPVSC_EVENT
Trigger description: IP-camera device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
 The value in parenthesis is a default value
Trigger mapping function: CISCO_IP_CAMERA_AUTO_SMARTPORT
```

```
Trigger Id: CISCO_LAST_RESORT_EVENT
Trigger description: Last resortevent to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_LAST_RESORT_SMARTPORT

Trigger Id: CISCO_PHONE_EVENT
Trigger description: IP-phone device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
and $VOICE_VLAN=(2), The value in the parenthesis is a default value
Trigger mapping function: CISCO_PHONE_AUTO_SMARTPORT

Trigger Id: CISCO_ROUTER_EVENT
Trigger description: Router device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $NATIVE_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_ROUTER_AUTO_SMARTPORT

Trigger Id: CISCO_SWITCH_ETHERCHANNEL_CONFIG
Trigger description: etherchannel parameter
Trigger environment: $INTERFACE_LIST=(),$PORT-CHANNEL_ID=(),
                           $EC_MODE=(),$EC_PROTOCOLTYPE=(),
                           PORT-CHANNEL_TYPE=()
Trigger mapping function: CISCO_ETHERCHANNEL_AUTOSMARTPORT

Trigger Id: CISCO_SWITCH_EVENT
Trigger description: Switch device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $NATIVE_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_SWITCH_AUTO_SMARTPORT

Trigger Id: CISCO_WIRELESS_AP_EVENT
Trigger description: Autonomous ap device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $NATIVE_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_AP_AUTO_SMARTPORT

Trigger Id: CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT
Trigger description: Lightweight-ap device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
  The value in the parenthesis is a default value
Trigger mapping function: CISCO_LWAP_AUTO_SMARTPORT

Trigger Id: word
Trigger description: word
Trigger environment:
Trigger mapping function:
```

This example shows how to use the **show shell functions** command to view the built-in macros in the switch software:

```
Device# show shell functions
#User defined functions:

#Built-in functions:
function CISCO_AP_AUTO_SMARTPORT () {
    if [[ $LINKUP == YES ]]; then
        conf t
            interface  $INTERFACE
                macro description $TRIGGER
                switchport trunk encapsulation dot1q
                switchport trunk native vlan $NATIVE_VLAN
                switchport trunk allowed vlan ALL
```

```
                      switchport mode trunk
                      switchport nonegotiate
                      auto qos voip trust
                      mls qos trust cos
                      if [[ $LIMIT == 0 ]]; then
                        default srr-queue bandwidth limit
                      else
                        srr-queue bandwidth limit $LIMIT
                      fi
                      if [[ $SW_POE == YES ]]; then
                         if [[ $AP125X == AP125X ]]; then
                            macro description AP125X
                            macro auto port sticky
                            power inline port maximum 20000
                         fi
                      fi
                   exit
                end
         fi
         if [[ $LINKUP == NO ]]; then
             conf t
                 interface  $INTERFACE
                      no macro description
                      no switchport nonegotiate
                      no switchport trunk native vlan $NATIVE_VLAN
                      no switchport trunk allowed vlan ALL
                      no auto qos voip trust
                      no mls qos trust cos
                      default srr-queue bandwidth limit
                      if [[ $AUTH_ENABLED == NO ]]; then
                        no switchport mode
                        no switchport trunk encapsulation
                      fi
                      if [[ $STICKY == YES ]]; then
                         if [[ $SW_POE == YES ]]; then
                            if [[ $AP125X == AP125X ]]; then
                               no macro auto port sticky
                               no power inline port maximum
                            fi
                         fi
                      fi
                 exit
             end
         fi
}
<output truncated>
```

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
Cisco IOS XE Fuji 16.9.2	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:

```
Device# show system mtu
Global Ethernet MTU is 1500 bytes.
```

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**

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.	
isis	(Optional) Displays CLNS and ISIS related information.	
license	(Optional) Displays license related information.	
lisp	(Optional) Displays Locator/ID Separation Protocol related information.	
memory	(Optional) Displays Memory related information.	
mfib	(Optional) Displays MFIB related information.	
msrp	(Optional) Displays MSRP related information.	
mvrp	(Optional) Displays MVRP 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>".	

performance-monitor	(Optional) Displays Performance Monitor related information.
pki	(Optional) Displays PKI related information.
platform	(Optional) Displays Platform related information.
qos	(Optional) Displays QoS related information.
subscriber	(Optional) Displays subscriber related information.
switch-report	(Optional) Archives switch report.
vrrp	(Optional) Displays VRRP related information.
wccp	(Optional) Displays WCCP related information.

Command Modes	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	This command was implemented.

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 tech-support bgp

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

show tech-support bgp [**address-family** {**all** | **ipv4** [**flowspec** | **multicast** | **unicast** | [**mdt** | **mvpn**] {**all** | **vrf** *vrf-instance-name*}] | **ipv6** [**flowspec** | **multicast** | **mvpn** {**all** | **vrf** *vrf-instance-name*} | **unicast**] | **l2vpn** [**evpn** | **vpls**] | **link-state** [**link-state**] | [**nsap** | **rtfilter**] [**unicast**] | [**vpnv4** | **vpnv6**] [**flowspec** | **multicast** | **unicast**] {**all** | **vrf** *vrf-instance-name*} }] [**detail**]

Syntax Description		
address-family	(Optional) Displays the output for a specified address family.
address-family all	(Optional) Displays the output for all address families.
ipv4	(Optional) Displays the output for IPv4 address family.
ipv6	(Optional) Displays the output for IPv6 address family.
l2vpn	(Optional) Displays the output for L2VPN address family.
link-state	(Optional) Displays the output for Link State address family.
nsap	(Optional) Displays the output for NSAP address family.
rtfilter	(Optional) Displays the output for RT Filter address family.
vpnv4	(Optional) Displays the output for VPNv4 address family.
vpnv6	(Optional) Displays the output for VPNv6 address family.
flowspec	(Optional) Displays the flowspec related information for an address family.
multicast	(Optional) Displays the multicast related information for an address family.
unicast	(Optional) Displays the unicast related information for an address family.
mdt	(Optional) Displays the Multicast Distribution Tree (MDT) related information for an address family.

mvpn	(Optional) Displays the Multicast VPN (MVPN) related information for an address family.
vrf	Displays the information for a VPN Routing/Forwarding instance.
evpn	(Optional) Displays the Ethernet VPN (EVPN) related information for an address family.
vpls	(Optional) Displays the Virtual Private LAN Services (VPLS) related information for an address family.
vrf-instance-name	Specifies the name of the VPN Routing/Forwarding instance.
all	Displays the information about all VPN NLRIs.
detail	(Optional) Displays the detailed routes information.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

The **show tech-support bgp** command is used to display the outputs of various BGP show commands and log them to the show-tech file. The output from the **show tech-support bgp** 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.

The following **show** commands run automatically when the **show tech-support bgp** command is used:

  • **show clock**

  • **show version**

  • **show running-config**

  • **show process cpu sorted**

  • **show process cpu history**

  • **show process memory sorted**

The following **show** commands for a specific address family run automnatically when the **show tech-support bgp address-family***address-family-name address-family-modifier* command is used:

- **show bgp** *address-family-name address-family-modifier* **summary**

- **show bgp** *address-family-name address-family-modifier* **detail**

- **show bgp** *address-family-name address-family-modifier* **internal**

- **show bgp** *address-family-name address-family-modifier* **neighbors**

- **show bgp** *address-family-name address-family-modifier* **update-group**

- **show bgp** *address-family-name address-family-modifier* **replication**

- **show bgp** *address-family-name address-family-modifier* **community**

- **show bgp** *address-family-name address-family-modifier* **dampening dampened-paths**

- **show bgp** *address-family-name address-family-modifier* **dampening flap-statistics**

- **show bgp** *address-family-name address-family-modifier* **dampening parameters**

- **show bgp** *address-family-name address-family-modifier* **injected-paths**

- **show bgp** *address-family-name address-family-modifier* **cluster-ids**

- **show bgp** *address-family-name address-family-modifier* **cluster-ids internal**

- **show bgp** *address-family-name address-family-modifier* **peer-group**

- **show bgp** *address-family-name address-family-modifier* **pending-prefixes**

- **show bgp** *address-family-name address-family-modifier* **rib-failure**

In addition to the above commands, the following segment routing specific **show** commands also run when the **show tech-support bgp** command is used:

- **show bgp all binding-sid**

- **show segment-routing client**

- **show segment-routing mpls state**

- **show segment-routing mpls gb**

- **show segment-routing mpls connected-prefix-sid-map protocol ipv4**

- **show segment-routing mpls connected-prefix-sid-map protocol backup ipv4**

- **show mpls traffic-eng tunnel auto-tunnel client bgp**

show tech-support diagnostic

To display diagnostic information for technical support, use the **show tech-support diagnostic** command in privileged EXEC mode.

show tech-support diagnostic

Syntax Description   This command has no arguments or keywords.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The output of this command is very long. To better manage this output, you can redirect the output to a file (for example, **show tech-support diagnostic** > **flash:***filename*) in the local writable storage file system or remote file system.

Note   For devices that support stacking, this command is executed on every switch that is up. For devices that do not support stacking, this command is executed only on the active switch.

The output of this command displays the output of the following commands:

- **show clock**
- **show version**
- **show running-config**
- **show inventory**
- **show diagnostic bootup level**
- **show diagnostic status**
- **show diagnostic content switch all**
- **show diagnostic result switch all detail**
- **show diagnostic schedule switch all**
- **show diagnostic post**
- **show diagnostic description switch [switch number] test all**
- **show logging onboard switch [switch number] clilog detail**
- **show logging onboard switch [switch number] counter detail**
- **show logging onboard switch [switch number] environment detail**
- **show logging onboard switch [switch number] message detail**

- **show logging onboard switch [switch number] poe detail**

- **show logging onboard switch [switch number] status**

- **show logging onboard switch [switch number] temperature detail**

- **show logging onboard switch [switch number] uptime detail**

- **show logging onboard switch [switch number] voltage detail**

speed

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

✎

Note	Available configuration options depend on the switch model and transceiver module installed. Options include 10, 100, 1000, 2500, 5000, 10000, 25000, 40000, 100000

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**, **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 (config-if)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	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 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:

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

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

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

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

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

start (coap-proxy configuration)

To start CoAP on the switch, use the **start** command in coap-proxy configuration mode.

start

Command Modes   coap-proxy configuration (config-coap-proxy)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines   To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to start CoAP on the switch.

```
Device(config)# coap proxy
Device(config-coap-proxy)# start
```

stop (coap-proxy configuration)

To stop CoAP on the switch, use the **stop** command in coap-proxy configuration mode.

stop

Command Modes

coap-proxy configuration (config-coap-proxy)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This example shows how to stop CoAP on the switch.

```
Device(config)# coap proxy
Device(config-coap-proxy)# stop
```

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 (config-if)

Command History	**Release**	**Modification**
	Cisco IOS XE Fuji 16.9.2	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:

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

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

system mtu

To set the global maximum packet size or MTU size for switched packets on Gigabit Ethernet and 10-Gigabit Ethernet ports, use the **system mtu** command in global configuration mode. To restore the global MTU value to its default value, use the **no** form of this command.

system mtu *bytes*
no system mtu

Syntax Description	*bytes* The global MTU size in bytes. The range is 1500 to 9198 bytes; the default is 1500 bytes.

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

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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.

Examples This example shows how to set the global system MTU size to 6000 bytes:

```
Device(config)# system mtu 6000
Global Ethernet MTU is set to 6000 bytes.
Note: this is the Ethernet payload size, not the total
Ethernet frame size, which includes the Ethernet
header/trailer and possibly other tags, such as ISL or
802.1q tags.
```

transport (coap-proxy configuration)

To configure transport protocol, use the **transport** command in coap-proxy configuration mode.

transport{**tcp** | **udp**}

Syntax Description		
	tcp	Specifies a TCP protocol.
	udp	Specifies a UDP protocol.

Command Modes coap-proxy configuration (config-coap-proxy)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines To access coap-proxy configuration mode, enter the **coap proxy** command in global configuration mode.

Example

This is an example to configure tcp as transport protocol

```
Device(config)# coap proxy
Device(config-coap-proxy)# transport tcp
```

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		
vlan-id	(Optional) The VLAN for voice traffic. The range is 1 to 4094.
cos *cos-value*	(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 *dscp-value*	(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
	Cisco IOS XE Fuji 16.9.2	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:

```
Device(config)# network-policy profile 1
Device(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:

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

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

```
Device(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 *cos-value*	(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 *dscp-value*	(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
Cisco IOS XE Fuji 16.9.2	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:

```
Device(config)# network-policy profile 1
Device(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:

```
Device(config)# network-policy profile 1
Device(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:

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

voice vlan (network-policy configuration)