



# System Management Commands

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# arp

To display the contents of the Address Resolution Protocol (ARP) table, use the **arp** command in boot loader mode.

**arp** [*ip\_address*]

---

|                           |  |
|---------------------------|--|
| <b>Syntax Description</b> | <i>ip_address</i> (Optional) Shows the ARP table or the mapping for a specific IP address. |
|---------------------------|--|

---

|                        |                                |
|------------------------|--------------------------------|
| <b>Command Default</b> | No default behavior or values. |
|------------------------|--------------------------------|

|                      |             |
|----------------------|-------------|
| <b>Command Modes</b> | Boot loader |
|----------------------|-------------|

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

---

|                         |  |
|-------------------------|--|
| <b>Usage Guidelines</b> | The ARP table contains the IP-address-to-MAC-address mappings. |
|-------------------------|--|

|                 |  |
|-----------------|--|
| <b>Examples</b> | This example shows how to display the ARP table: |
|-----------------|--|

```
Device: arp 172.20.136.8
arp'ing 172.20.136.8...
172.20.136.8 is at 00:1b:78:d1:25:ae, via port 0
```

# boot

To load and boot an executable image and display the command-line interface (CLI), use the **boot** command in boot loader mode.

```
boot [-post | -n | -p | flag] filesystem:/file-url...
```

| Syntax Description |   |
|--------------------|---|
| <b>-post</b>       | (Optional) Run the loaded image with an extended or comprehensive power-on self-test (POST). Using this keyword causes POST to take longer to complete. |
| <b>-n</b>          | (Optional) Pause for the Cisco IOS Debugger immediately after launching.  |
| <b>-p</b>          | (Optional) Pause for the JTAG Debugger right after loading the image.   |
| <i>filesystem:</i> | Alias for a file system. Use <b>flash:</b> for the system board flash device; use <b>usbflash0:</b> for USB memory sticks.                              |
| <i>/file-url</i>   | Path (directory) and name of a bootable image. Separate image names with a semicolon.   |

**Command Default** No default behavior or values.

**Command Modes** Boot loader

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines**

When you enter the **boot** command without any arguments, the device attempts to automatically boot the system by using the information in the BOOT environment variable, if any.

If you supply an image name for the *file-url* variable, the **boot** command attempts to boot the specified image.

When you specify boot loader **boot** command options, they are executed immediately and apply only to the current boot loader session.

These settings are not saved for the next boot operation.

Filenames and directory names are case sensitive.

## Example

This example shows how to boot the device using the *new-image.bin* image:

```
Device: set BOOT flash:/new-images/new-image.bin  
Device: boot
```

After entering this command, you are prompted to start the setup program.

# cat

To display the contents of one or more files, use the **cat** command in boot loader mode.

**cat** *filesystem:/file-url...*

## Syntax Description

*filesystem:* Specifies a file system.

*/file-url* Specifies the path (directory) and name of the files to display. Separate each filename with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

Filenames and directory names are case sensitive.

If you specify a list of files, the contents of each file appears sequentially.

## Examples

This example shows how to display the contents of an image file:

```
Device: cat flash:image_file_name
version_suffix: universal-122-xx.SEx
version_directory: image_file_name
image_system_type_id: 0x00000002
image_name: image_file_name.bin
ios_image_file_size: 8919552
total_image_file_size: 11592192
image_feature: IP|LAYER_3|PLUS|MIN_DRAM_MEG=128
image_family: family
stacking_number: 1.34
board_ids: 0x00000068 0x00000069 0x0000006a 0x0000006b
info_end:
```

# copy

To copy a file from a source to a destination, use the **copy** command in boot loader mode.

```
copy filesystem:/source-file-url filesystem:/destination-file-url
```

## Syntax Description

|                              |   |
|------------------------------|---|
| <i>filesystem:</i>           | Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks. |
| <i>/source-file-url</i>      | Path (directory) and filename (source) to be copied.                  |
| <i>/destination-file-url</i> | Path (directory) and filename of the destination.                     |

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

Filenames and directory names are case sensitive.

Directory names are limited to 127 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

Filenames are limited to 127 characters; the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

If you are copying a file to a new directory, the directory must already exist.

## Examples

This example shows how to copy a file at the root:

```
Device: copy usbflash0:test1.text usbflash0:test4.text  
File "usbflash0:test1.text" successfully copied to "usbflash0:test4.text"
```

You can verify that the file was copied by entering the **dir filesystem:** boot loader command.

## copy startup-config tftp:

To copy the configuration settings from a switch to a TFTP server, use the **copy startup-config tftp:** command in Privileged EXEC mode.

**copy startup-config tftp:** *remote host {ip-address}/{name}*

---

|                           |  |
|---------------------------|--|
| <b>Syntax Description</b> | <i>remote host {ip-address}/{name}</i> Host name or IP-address of Remote host. |
|---------------------------|--|

---

|                        |                                |
|------------------------|--------------------------------|
| <b>Command Default</b> | No default behavior or values. |
|------------------------|--------------------------------|

---

|                      |                 |
|----------------------|-----------------|
| <b>Command Modes</b> | Privileged EXEC |
|----------------------|-----------------|

---

| <b>Command History</b> | <b>Release</b>            | <b>Modification</b>          |
|------------------------|---------------------------|------------------------------|
|                        | Cisco IOS XE Release 16.1 | This command was introduced. |

---

**Usage Guidelines** To copy your current configurations from the switch, run the command **copy startup-config tftp:** and follow the instructions. The configurations are copied onto the TFTP server.

Then, login to another switch and run the command **copy tftp: startup-config** and follow the instructions. The configurations are now copied onto the other switch.

**Examples** This example shows how to copy the configuration settings onto a TFTP server:

```
Device: copy startup-config tftp:
Address or name of remote host []?
```



## copy tftp: startup-config

To copy the configuration settings from a TFTP server onto a new switch, use the **copy tftp: startup-config** command in Privileged EXEC mode on the new switch.

**copy tftp: startup-config** *remote host {ip-address}/{name}*

|                           |  |
|---------------------------|--|
| <b>Syntax Description</b> | <i>remote host {ip-address}/{name}</i> Host name or IP-address of Remote host. |
|---------------------------|--|

|                        |                                |
|------------------------|--------------------------------|
| <b>Command Default</b> | No default behavior or values. |
|------------------------|--------------------------------|

|                      |                 |
|----------------------|-----------------|
| <b>Command Modes</b> | Privileged EXEC |
|----------------------|-----------------|

| <b>Command History</b> | <b>Release</b>            | <b>Modification</b>          |
|------------------------|---------------------------|------------------------------|
|                        | Cisco IOS XE Release 16.1 | This command was introduced. |

|                         |   |
|-------------------------|---|
| <b>Usage Guidelines</b> | After the configurations are copied, to save your configurations, use <b>write memory</b> command and then either reload the switch or run the <b>copy startup-config running-config</b> command. |
|-------------------------|---|

|                 |   |
|-----------------|---|
| <b>Examples</b> | This example shows how to copy the configuration settings from the TFTP server onto a switch: |
|-----------------|---|

```
Device: copy tftp: startup-config
Address or name of remote host []?
```

## debug voice diagnostics mac-address

To enable debugging of voice diagnostics for voice clients, use the **debug voice diagnostics mac-address** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

**debug voice diagnostics mac-address** *mac-address1* **verbose** **mac-address** *mac-address2* **verbose**  
**nodebug voice diagnostics mac-address** *mac-address1* **verbose** **mac-address** *mac-address2* **verbose**

| Syntax Description  |  |   |
|---|--|---|
| <b>voice diagnostics</b>  |  | Configures voice debugging for voice clients. |
| <b>mac-address</b> <i>mac-address1</i> <b>mac-address</b> <i>mac-address2</i> |  | Specifies MAC addresses of the voice clients. |
| <b>verbose</b>  |  | Enables verbose mode for voice diagnostics.   |

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

The following is sample output from the **debug voice diagnostics mac-address** command and shows how to enable debugging of voice diagnostics for voice client with MAC address of 00:1f:ca:cf:b6:60:

```
Device# debug voice diagnostics mac-address 00:1f:ca:cf:b6:60
```

# debug platform condition feature multicast controlplane

To enable radioactive tracing for the Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) snooping features, use the **debug platform condition feature multicast controlplane** command in privileged EXEC mode. To disable radioactive tracing, use the **no** form of this command.

**debug platform condition feature multicast controlplane** **{igmp-debug | pim}** **group-ip** {*ipv4 address* / *ipv6 address*} | **{mld-snooping | igmp-snooping}** **mac** *mac-address* **ip** {*ipv4 address* / *ipv6 address*} **vlan** *vlan-id* } **level** {**debug** | **error** | **info** | **verbose** | **warning**}

**no debug platform condition feature multicast controlplane** **{igmp-debug | pim}** **group-ip** {*ipv4 address* / *ipv6 address*} | **{mld-snooping | igmp-snooping}** **mac** *mac-address* **ip** {*ipv4 address* / *ipv6 address*} **vlan** *vlan-id* } **level** {**debug** | **error** | **info** | **verbose** | **warning**}

| Syntax  | Description   |
|---|---|
| <b>igmp-debug</b>   | Enables IGMP control radioactive tracing.                                 |
| <b>pim</b>  | Enables Protocol Independent Multicast (PIM) control radioactive tracing. |
| <b>mld-snooping</b>   | Enables MLD snooping control radioactive tracing.                         |
| <b>igmp-snooping</b>  | Enables IGMP snooping control radioactive tracing.                        |
| <b>mac</b> <i>mac-address</i>                                 | MAC address of the receiver.  |
| <b>group-ip</b> { <i>ipv4 address</i> / <i>ipv6 address</i> } | IPv4 or IPv6 address of the igmp-debug or pim group.                      |
| <b>ip</b> { <i>ipv4 address</i> / <i>ipv6 address</i> }       | IPv4 or IPv6 address of the mld-snooping or igmp-snooping group.          |
| <b>vlan</b> <i>vlan-id</i>                                    | VLAN ID. The range is from 1 to 4094.                                     |
| <b>level</b>  | Enables debug severity levels.  |
| <b>debug</b>  | Enables debugging level.  |
| <b>error</b>  | Enables error debugging.  |
| <b>info</b>   | Enables information debugging.  |
| <b>verbose</b>  | Enables detailed debugging.   |
| <b>warning</b>  | Enables warning debugging.  |

**Command Modes** Privileged EXEC (#)

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

The following example shows how to enable radioactive tracing for IGMP snooping:

```
Device# debug platform condition feature multicast controlplane igmp-snooping mac
000a.f330.344a ip 10.1.1.10 vlan 550 level warning
```

| Related Commands | Command                                   | Description  |
|------------------|---|--|
|                  | <b>clear debug platform condition all</b> | Removes the debug conditions applied to a platform.                                      |
|                  | <b>debug platform condition</b>           | Filters debugging output for <b>debug</b> commands on the basis of specified conditions. |
|                  | <b>debug platform condition start</b>     | Starts conditional debugging on a system.  |
|                  | <b>debug platform condition stop</b>      | Stops conditional debugging on a system.   |
|                  | <b>show platform condition</b>            | Displays the currently active debug configuration.                                       |

# debug platform condition mac

To enable radioactive tracing for MAC learning, use the **debug platform condition mac** command in privileged EXEC mode. To disable radioactive tracing for MAC learning, use the **no** form of this command.

**debug platform condition mac** {*mac-address* {**control-plane** | **egress** | **ingress**} | **access-list** *access-list name* {**egress** | **ingress**}}  
**no debug platform condition mac** {*mac-address* {**control-plane** | **egress** | **ingress**} | **access-list** *access-list name* {**egress** | **ingress**}}

| Syntax Description                         |  |   |
|--|--|---|
| <b>mac</b> <i>mac-address</i>              |  | Filters output on the basis of the specified MAC address. |
| <b>access-list</b> <i>access-list name</i> |  | Filters output on the basis of the specified access list. |
| <b>control-plane</b>                       |  | Displays messages about the control plane routines.       |
| <b>egress</b>                              |  | Filters output on the basis of outgoing packets.          |
| <b>ingress</b>                             |  | Filters output on the basis of incoming packets.          |

**Command Modes** Privileged EXEC (#)

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

The following example shows how to filter debugging output on the basis of a MAC address:

```
Device# debug platform condition mac bc16.6509.3314 ingress
```

| Related Commands | Command                                   | Description  |
|------------------|---|--|
|                  | <b>show platform condition</b>            | Displays the currently active debug configuration.                                       |
|                  | <b>debug platform condition</b>           | Filters debugging output for <b>debug</b> commands on the basis of specified conditions. |
|                  | <b>debug platform condition start</b>     | Starts conditional debugging on a system.  |
|                  | <b>debug platform condition stop</b>      | Stops conditional debugging on a system.   |
|                  | <b>clear debug platform condition all</b> | Removes the debug conditions applied to a platform.                                      |

# debug platform rep

To enable debugging of Resilient Ethernet Protocol (REP) functions, use the **debug platform rep** command in privileged EXEC mode. To remove the specified condition, use the **no** form of this command.

**debug platform rep** {all | error | event | packet | verbose}  
**no debug platform rep** {all | error | event | packet | verbose}

| Syntax Description |                |                                      |
|--------------------|----------------|--------------------------------------|
|                    | <b>all</b>     | Enables all REP debugging functions. |
|                    | <b>error</b>   | Enables REP error debugging.         |
|                    | <b>event</b>   | Enables REP event debugging.         |
|                    | <b>packet</b>  | Enables REP packet debugging.        |
|                    | <b>verbose</b> | Enables REP verbose debugging.       |

**Command Modes** Privileged EXEC (#)

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

The following example shows how to enable debugging for all functions:

```
Device# debug platform rep all

debug platform rep verbose debugging is on
debug platform rep control pkt handle debugging is on
debug platform rep error debugging is on
debug platform rep event debugging is on
```

| Related Commands | Command                                   | Description  |
|------------------|---|--|
|                  | <b>show platform condition</b>            | Displays the currently active debug configuration.                                       |
|                  | <b>debug platform condition</b>           | Filters debugging output for <b>debug</b> commands on the basis of specified conditions. |
|                  | <b>debug platform condition start</b>     | Starts conditional debugging on a system.  |
|                  | <b>debug platform condition stop</b>      | Stops conditional debugging on a system.   |
|                  | <b>clear debug platform condition all</b> | Removes the debug conditions applied to a platform.                                      |

# debug ilpower powerman

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

**Command Default** 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. |

This example shows the output for the **debug ilpower powerman** command for releases prior to Cisco IOS XE Gibraltar 16.10.1:

```
Device# debug ilpower powerman
1. %ILPOWER-3-CONTROLLER_PORT_ERR: Controller port error, Interface
Gix/y/z: Power Controller reports power Imax error detected
Mar 8 16:35:17.801: ilpower_power_assign_handle_event: event 0, pwrassign
is done by proto CDP
Port Gil/0/48: Selected Protocol CDP
Mar 8 16:35:17.801: Ilpowerinterface (Gil/0/48) process tlvfrom cdpINPUT:

Mar 8 16:35:17.801: power_consumption= 2640, power_request_id= 1,
power_man_id= 2,
Mar 8 16:35:17.801: power_request_level[] = 2640 0 0 0 0
Mar 8 16:35:17.801:
Mar 8 16:35:17.801: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.802: Ilpowerinterface (Gil/0/48) power negotiation:
consumption = 2640, alloc_power= 2640
Mar 8 16:35:17.802: Ilpowerinterface (Gil/0/48) setting ICUT_OFF threshold
to 2640.
Mar 8 16:35:17.802: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.802: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.803: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.803: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:18.115: ILP:: posting ilpslot 1 port 48 event 5 class 0
Mar 8 16:35:18.115: ILP:: Gil/0/48: State=NGWC_ILP_LINK_UP_S-6,
Event=NGWC_ILP_IMAX_FAULT_EV-5
Mar 8 16:35:18.115: ilpowerdelete power from pdlinkdownGil/0/48
Mar 8 16:35:18.115: Ilpowerinterface (Gil/0/48), delete allocated power
2640
Mar 8 16:35:18.116: Ilpowerinterface (Gil/0/48) setting ICUT_OFF threshold
to 0.
Mar 8 16:35:18.116: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:18.116: ilpower_notify_lldp_power_via_mdi_tlvGil/0/48 pwralloc0
Mar 8 16:35:18.116: Gil/0/48 AUTO PORT PWR Alloc130 Request 130
Mar 8 16:35:18.116: Gil/0/48: LLDP NOTIFY TLV:
```

```
(curr/prev) PSE Allocation: 13000/0
(curr/prev) PD Request : 13000/0
(curr/prev) PD Class : Class 4/
(curr/prev) PD Priority : low/unknown
(curr/prev) Power Type : Type 2 PSE/Type 2 PSE
(curr/prev) mdi_pwr_support: 7/0
(curr/prevPower Pair) : Signal/
(curr/prev) PSE PwrSource : Primary/Unknown
```

This example shows the output for the **debug ilpower powerman** command starting Cisco IOS XE Gibraltar 16.10.1. Power Unit (mW) has been added to the `power_request_level`, PSE Allocation and PD Request. `Power_request_level` has been enhanced to display only non-zero values.

```
Device# debug ilpower powerman
1. %ILPOWER-3-CONTROLLER_PORT_ERR: Controller port error, Interface
Gix/y/z: Power Controller reports power Imax error detected
Mar 8 16:35:17.801: ilpower_power_assign_handle_event: event 0, pwrassign
  is done by proto CDP
Port Gil/0/48: Selected Protocol CDP
Mar 8 16:35:17.801: Ilpowerinterface (Gil/0/48) process tlvfrom cdpINPUT:

Mar 8 16:35:17.801: power_consumption= 2640, power_request_id= 1,
power_man_id= 2,
Mar 8 16:35:17.801: power_request_level(mW) = 2640
<----- mW unit added, non-zero value display
Mar 8 16:35:17.801:
Mar 8 16:35:17.801: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.802: Ilpowerinterface (Gil/0/48) power negotiation:
consumption = 2640, alloc_power= 2640
Mar 8 16:35:17.802: Ilpowerinterface (Gil/0/48) setting ICUT_OFF threshold
to 2640.
Mar 8 16:35:17.802: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.802: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.803: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.803: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:17.803: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:18.115: ILP:: posting ilpslot 1 port 48 event 5 class 0
Mar 8 16:35:18.115: ILP:: Gil/0/48: State=NGWC_ILP_LINK_UP_S-6,
Event=NGWC_ILP_IMAX_FAULT_EV-5
Mar 8 16:35:18.115: ilpowerdelete power from pdlinkdownGil/0/48
Mar 8 16:35:18.115: Ilpowerinterface (Gil/0/48), delete allocated power
2640
Mar 8 16:35:18.116: Ilpowerinterface (Gil/0/48) setting ICUT_OFF threshold
to 0.
Mar 8 16:35:18.116: ILP:: Sending icutoffcurrent msgto slot:1 port:48
Mar 8 16:35:18.116: ilpower_notify_lldp_power_via_mdi_tlvGil/0/48 pwralloc0
Mar 8 16:35:18.116: Gil/0/48 AUTO PORT PWR Alloc130 Request 130
Mar 8 16:35:18.116: Gil/0/48: LLDP NOTIFY TLV:
(curr/prev) PSE Allocation (mW): 13000/0
<----- mW unit added
(curr/prev) PD Request (mW) : 13000/0
<----- mW unit added
```



```
(curr/prev) PD Class : Class 4/  
(curr/prev) PD Priority : low/unknown  
(curr/prev) Power Type : Type 2 PSE/Type 2 PSE  
(curr/prev) mdi_pwr_support: 7/0  
(curr/prevPower Pair) : Signal/  
(curr/prev) PSE PwrSource : Primary/Unknown
```

# delete

To delete one or more files from the specified file system, use the **delete** command in boot loader mode.

**delete** *filesystem:/file-url...*

---

## Syntax Description

*filesystem:* Alias for a file system. Use **usbflash0:** for USB memory sticks.

*/file-url...* Path (directory) and filename to delete. Separate each filename with a space.

---



---

## Command Default

No default behavior or values.

---

## Command Modes

Boot loader

---

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

---



---

## Usage Guidelines

Filenames and directory names are case sensitive.

The device prompts you for confirmation before deleting each file.

---

## Examples

This example shows how to delete two files:

```
Device: delete usbflash0:test2.text usbflash0:test5.text
Are you sure you want to delete "usbflash0:test2.text" (y/n)?y
File "usbflash0:test2.text" deleted
Are you sure you want to delete "usbflash0:test5.text" (y/n)?y
File "usbflash0:test2.text" deleted
```

You can verify that the files were deleted by entering the **dir usbflash0:** boot loader command.

# dir

To display the list of files and directories on the specified file system, use the **dir** command in boot loader mode.

**dir** *filesystem:/file-url*

| <b>Syntax Description</b>    | <i>filesystem:</i> Alias for a file system. Use <b>flash:</b> for the system board flash device; use <b>usbflash0:</b> for USB memory sticks.  |         |              |                              |                              |
|------------------------------|--|---------|--------------|------------------------------|------------------------------|
|                              | <i>/file-url</i> (Optional) Path (directory) and directory name that contain the contents you want to display. Separate each directory name with a space.  |         |              |                              |                              |
| <b>Command Default</b>       | No default behavior or values.   |         |              |                              |                              |
| <b>Command Modes</b>         | Boot Loader<br>Privileged EXEC   |         |              |                              |                              |
| <b>Command History</b>       | <table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Cisco IOS XE Everest 16.5.1a</td> <td>This command was introduced.</td> </tr> </tbody> </table> | Release | Modification | Cisco IOS XE Everest 16.5.1a | This command was introduced. |
| Release                      | Modification   |         |              |                              |                              |
| Cisco IOS XE Everest 16.5.1a | This command was introduced.   |         |              |                              |                              |
| <b>Usage Guidelines</b>      | Directory names are case sensitive.  |         |              |                              |                              |
| <b>Examples</b>              | This example shows how to display the files in flash memory:   |         |              |                              |                              |

```
Device: dir flash:
Directory of flash:/
  2  -rwx      561   Mar 01 2013 00:48:15  express_setup.debug
  3  -rwx    2160256  Mar 01 2013 04:18:48  c2960x-dmon-mz-150-2r.EX
  4  -rwx      1048   Mar 01 2013 00:01:39  multiple-fs
  6  drwx      512   Mar 01 2013 23:11:42  c2960x-universalk9-mz.150-2.EX
645 drwx      512   Mar 01 2013 00:01:11  dc_profile_dir
647 -rwx      4316   Mar 01 2013 01:14:05  config.text
648 -rwx        5    Mar 01 2013 00:01:39  private-config.text

96453632 bytes available (25732096 bytes used)
```

**Table 1: dir Field Descriptions**

| Field | Description  |
|-------|--|
| 2     | Index number of the file.  |
| -rwx  | File permission, which can be any or all of the following: <ul style="list-style-type: none"> <li>• d—directory</li> <li>• r—readable</li> <li>• w—writable</li> <li>• x—executable</li> </ul> |

| Field    | Description             |
|----------|-------------------------|
| 1644045  | Size of the file.       |
| <date>   | Last modification date. |
| env_vars | Filename.               |



```
Bootloader: Done loading app on core_mask: 0xf
```

```
### Launching Linux Kernel (flags = 0x5)
```

```
Initiating Emergency Installation of bundle
tftp:<url>
```

```
Downloading bundle tftp:<url>...
```

```
Validating bundle tftp:<url>...
```

```
Installing bundle tftp:<url>...
```

```
Verifying bundle tftp:<url>...
```

```
Package cat3k_caa-base.SPA.03.02.00SE.pkg is Digitally Signed
```

```
Package cat3k_caa-drivers.SPA.03.02.00.SE.pkg is Digitally Signed
```

```
Package cat3k_caa-infra.SPA.03.02.00SE.pkg is Digitally Signed
```

```
Package cat3k_caa-iosd-universalk9.SPA.150-1.EX.pkg is Digitally Signed
```

```
Package cat3k_caa-platform.SPA.03.02.00.SE.pkg is Digitally Signed
```

```
Package cat3k_caa-wcm.SPA.10.0.100.0.pkg is Digitally Signed
```

```
Preparing flash...
```

```
Syncing device...
```

```
Emergency Install successful... Rebooting
```

```
Restarting system.\ufffd
```

```
Booting...(use DDR clock 667 MHz)Initializing and Testing RAM
```

```
+++@@@#####...+@@+@@+@@+@@+@@+@@+@@+@@+@@+@@done.
```

```
Memory Test Pass!
```

```
Base ethernet MAC Address: 20:37:06:ce:25:80
```

```
Initializing Flash...
```

```
flashfs[7]: 0 files, 1 directories
```

```
flashfs[7]: 0 orphaned files, 0 orphaned directories
```

```
flashfs[7]: Total bytes: 6784000
```

```
flashfs[7]: Bytes used: 1024
```

```
flashfs[7]: Bytes available: 6782976
```

```
flashfs[7]: flashfs fsck took 1 seconds....done Initializing Flash.
```

```
The system is not configured to boot automatically. The
following command will finish loading the operating system
software:
```

```
boot
```

# exit

To return to the previous mode or exit from the CLI EXEC mode, use the **exit** command.

## exit

---

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

---

**Command Default** No default behavior or values.

---

**Command Modes** Privileged EXEC  
Global configuration

---

| <b>Command History</b> | <b>Release</b>                  | <b>Modification</b>             |
|------------------------|---------------------------------|---------------------------------|
|                        | Cisco IOS XE Everest<br>16.5.1a | This command was<br>introduced. |

---

This example shows how to exit the configuration mode:

```
Device(config)# exit  
Device#
```

# factory-reset

To erase all customer-specific data and restore a device to its factory configuration, use the **factory-reset** command in privileged EXEC mode.



**Note** The erasure is consistent with the clear method, as described in NIST SP 800-88 Rev. 1.

## Standalone Device

```
factory-reset { all [secure 3-pass] | boot-vars | config }
```

## Stacked Device

```
factory-reset { all [secure 3-pass] | boot-vars | config | switch switch_number | all { all [secure 3-pass] | boot-vars | config } }
```

## Syntax Description

|   |   |
|---|---|
| <b>all</b>  | Erases all the content from the NVRAM, all Cisco IOS images, including the current boot image, boot variables, startup and running configuration data, and user data.   |
| <b>secure 3-pass</b>                                | Erases all the content from the device with 3-pass overwrite. <ul style="list-style-type: none"> <li>• Pass 1: Overwrites all addressable locations with binary zeroes.</li> <li>• Pass 2: Overwrites all addressable locations with binary ones.</li> <li>• Pass 3: Overwrites all addressable locations with a random bit pattern.</li> </ul> |
| <b>boot-vars</b>                                    | Erases only the user-added boot variables.  |
| <b>config</b>                                       | Erases only the startup configurations.   |
| <b>switch</b> { <i>switch_number</i>   <b>all</b> } | Erases content on the selected switch: <ul style="list-style-type: none"> <li>• <i>switch-number</i>: Specifies the switch number. The range is from 1 to 16.</li> <li>• <b>all</b>: Selects all the switches in the stack.</li> </ul>  |

## Command Default

None

## Command Modes

Privileged EXEC (#)

## Command History

| Release                       | Modification   |
|-------------------------------|--|
| Cisco IOS XE Fuji 16.8.1a     | This command was introduced.                                       |
| Cisco IOS XE Amsterdam 17.2.1 | The <b>secure 3-pass</b> and <b>switch</b> keyword was introduced. |

## Usage Guidelines

The **factory-reset** command is used in the following scenarios:



- To return a device to Cisco for Return Material Authorization (RMA), use this command to remove all the customer-specific data before obtaining an RMA certificate for the device.
- If the key information or credentials that are stored on a device is compromised, use this command to reset the device to factory configuration, and then reconfigure the device.

After the factory reset process is successfully completed, the device reboots and enters ROMMON mode.

## Examples

The following example shows how to erase all the content from a device using the **factory-reset all** command:

```
Device> enable
Device# factory-reset all

The factory reset operation is irreversible for all operations. Are you sure? [confirm]
The following will be deleted as a part of factory reset:
1: Crash info and logs
2: User data, startup and running configuration
3: All IOS images, including the current boot image
4: OBFL logs
5: User added rommon variables
6: Data on Field Replaceable Units (USB/SSD/SATA)
The system will reload to perform factory reset.
It will take some time to complete and bring it to rommon.
You will need to load IOS image using USB/TFTP from rommon after
this operation is completed.
DO NOT UNPLUG THE POWER OR INTERRUPT THE OPERATION
Are you sure you want to continue? [confirm]
```

The following examples show how to perform a factory reset on stacked devices:

```
Device> enable
Device# factory-reset switch all all

The factory reset operation is irreversible for all operations. Are you sure? [confirm]
The following will be deleted as a part of factory reset:
1: Crash info and logs
2: User data, startup and running configuration
3: All IOS images, including the current boot image
4: OBFL logs
5: User added rommon variables
6: Data on Field Replaceable Units (USB/SSD/SATA)
The system will reload to perform factory reset.
It will take some time to complete and bring it to rommon.
You will need to load IOS image using USB/TFTP from rommon after
this operation is completed.
DO NOT UNPLUG THE POWER OR INTERRUPT THE OPERATION
Are you sure you want to continue? [confirm]
Chassis 1 reloading, reason - Factory Reset

Protection key not found
9300L#Oct 25 09:53:05.740: %PMAN-5-EXITACTION: F0/0: pvp: Process manager is exiting: reload
fp action requested
Oct 25 09:53:07.277: %PMAN-5-EXITACTION:vp: Process manager is exiting: rp processes exit
with reload switch code

Enabling factory reset for this reload cycle
Switch booted with
tftp://10.5.40.45/cat9k_iosxe.BLD_POLARIS_DEV_LATEST_20191007_224933_V17_2_0_21_2.SSA.bin
Switch booted via
//10.5.40.45/cat9k_iosxe.BLD_POLARIS_DEV_LATEST_20191007_224933_V17_2_0_21_2.SSA.bin
% FACTORYRESET - Started Cleaning Up...
```

```
% FACTORYRESET - Unmounting sd1
% FACTORYRESET - Cleaning Up sd1 [0]
% FACTORYRESET - erase In progress.. please wait for completion...
% FACTORYRESET - write zero...
% FACTORYRESET - finish erase

% FACTORYRESET - Making File System sd1 [0]
Discarding device blocks: done
Creating filesystem with 409600 4k blocks and 102544 inodes
Filesystem UUID: fcf01664-7c6f-41ce-99f0-6df1d941701e
Superblock backups stored on blocks:
 32768, 98304, 163840, 229376, 294912

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done

% FACTORYRESET - Mounting Back sd1 [0]
% FACTORYRESET - Handling Mounted sd1
% FACTORYRESET - Factory Reset Done for sd1

% FACTORYRESET - Unmounting sd3
% FACTORYRESET - Cleaning Up sd3 [0]
% FACTORYRESET - erase In progress.. please wait for completion...
% FACTORYRESET - write zero...

Chassis 2 reloading, reason - Factory Reset
Dec 12 01:02:12.500: %PMAN-5-EXITACTION: F0/0: pvp: Process manager is exiting: reload fp
action requested
De
Enabling factory reset for this reload cycle
Switch booted with
tftp://10.5.40.45/cat9k_iosxe.BLD_POLARIS_DEV_LATEST_20191007_224933_V17_2_0_21_2.SSA.bin
Switch booted via
//10.5.40.45/cat9k_iosxe.BLD_POLARIS_DEV_LATEST_20191007_224933_V17_2_0_21_2.SSA.bin
% FACTORYRESET - Started Cleaning Up...
% FACTORYRESET - Unmounting sd1
% FACTORYRESET - Cleaning Up sd1 [0]
% FACTORYRESET - erase In progress.. please wait for completion...
% FACTORYRESET - write zero...
```

After this the switch will come to boot prompt. Then the customer has to boot the device from TFTP.

# flash\_init

To initialize the flash: file system, use the **flash\_init** command in boot loader mode.

## **flash\_init**

---

**Syntax Description**

This command has no arguments or keywords.

---

**Command Default**

The flash: file system is automatically initialized during normal system operation.

---

**Command Modes**

Boot loader

---

**Command History**

| <b>Release</b>                  | <b>Modification</b>          |
|---------------------------------|------------------------------|
| Cisco IOS XE Everest<br>16.5.1a | This command was introduced. |

---

**Usage Guidelines**

During the normal boot process, the flash: file system is automatically initialized.

Use this command to manually initialize the flash: file system. For example, you use this command during the recovery procedure for a lost or forgotten password.

# help

To display the available commands, use the **help** command in boot loader mode.

## help

---

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

---

**Command Default** No default behavior or values.

---

**Command Modes** Boot loader

---

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

---

## Example

This example shows how to display a list of available boot loader commands:

```
Device:help
? -- Present list of available commands
arp -- Show arp table or arp-resolve an address
boot -- Load and boot an executable image
cat -- Concatenate (type) file(s)
copy -- Copy a file
delete -- Delete file(s)
dir -- List files in directories
emergency-install -- Initiate Disaster Recovery
...
...
...
unset -- Unset one or more environment variables
version -- Display boot loader version
```

# hostname

To specify or modify the hostname for the network server, use the **hostname** command in global configuration mode.

**hostname** *name*

|                           |             |                                      |
|---------------------------|-------------|--------------------------------------|
| <b>Syntax Description</b> | <i>name</i> | New hostname for the network server. |
|---------------------------|-------------|--------------------------------------|

**Command Default** The default hostname is switch.

**Command Modes** Global configuration (config)

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** The hostname is used in prompts and default configuration filenames.

Do not expect case to be preserved. Uppercase and lowercase characters look the same to many internet software applications. It may seem appropriate to capitalize a name the same way you might do in English, but conventions dictate that computer names appear all lowercase. For more information, refer to RFC 1178, *Choosing a Name for Your Computer*.

The name must also follow the rules for ARPANET hostnames. They must start with a letter, end with a letter or digit, and have as interior characters only letters, digits, and hyphens. Names must be 63 characters or fewer. Creating an all numeric hostname is not recommended but the name will be accepted after an error is returned.

```
Device(config)#hostname 123
% Hostname contains one or more illegal characters.
123(config)#
```

A hostname of less than 10 characters is recommended. For more information, refer to RFC 1035, *Domain Names--Implementation and Specification*.

On most systems, a field of 30 characters is used for the hostname and the prompt in the CLI. Note that the length of your hostname may cause longer configuration mode prompts to be truncated. For example, the full prompt for service profile configuration mode is:

```
(config-service-profile)#
```

However, if you are using the hostname of “Switch,” you will only see the following prompt (on most systems):

```
Switch(config-service-profil)#
```

If the hostname is longer, you will see even less of the prompt:

```
Basement-rtr2(config-service)#
```

Keep this behavior in mind when assigning a name to your system (using the **hostname** global configuration command). If you expect that users will be relying on mode prompts as a CLI navigation aid, you should assign hostnames of no more than nine characters.

The use of a special character such as \" (backslash) and a three or more digit number for the character setting like **hostname**, results in incorrect translation:

```
Device(config)#  
Device(config)#hostname \\99  
% Hostname contains one or more illegal characters.
```

## Examples

The following example changes the hostname to “host1”:

```
Device(config)# hostname host1  
host1(config)#
```

# install

To install Software Maintenance Upgrade (SMU) packages, use the **install** command in privileged EXEC mode.

```
install {abort | activate | file {bootflash: | flash: | harddisk: | webui:} [auto-abort-timer timer timer
prompt-level {all | none}] | add file {bootflash: | flash: | ftp: | harddisk: | http: | https: | rcp: | scp:
| tftp: | webui:} [activate [auto-abort-timer timer prompt-level {all | none}commit]}] | commit |
auto-abort-timer stop | deactivate file {bootflash: | flash: | harddisk: | webui:} | label id{description
description | label-name name} | remove {file {bootflash: | flash: | harddisk: | webui:} | inactive } |
rollback to {base | committed | id {install-ID } | label {label-name}}
```

| Syntax Description   |  |   |
|--|--|---|
| <b>abort</b>   |  | Terminates the current install operation.   |
| <b>activate</b>  |  | Validates whether the SMU is added through the <b>install add</b> command.<br><br>This keyword runs a compatibility check, updates package status, and if the package can be restarted, triggers post-install scripts to restart the necessary processes, or triggers a reload for nonrestartable packages.   |
| <b>file</b>  |  | Specifies the package to be activated.  |
| { <b>bootflash:</b>   <b>flash:</b>   <b>harddisk:</b>   <b>webui:</b> }   |  | Specifies the location of the installed package.  |
| <b>auto-abort-timer</b> <i>timer</i>   |  | (Optional) Installs an auto-abort timer.  |
| <b>prompt-level</b> { <b>all</b>   <b>none</b> }   |  | (Optional) Prompts a user about installation activities.<br><br>For example, the <b>activate</b> keyword automatically triggers a reload for packages that require a reload. Before activating the package, a message prompts users about wanting to continue or not.<br><br>The <b>all</b> keyword allows you to enable prompts. The <b>none</b> keyword disables prompts. |
| <b>add</b>   |  | Copies files from a remote location (through FTP or TFTP) to a device and performs SMU compatibility check for the platform and image versions.<br><br>This keyword runs base compatibility checks to ensure that a specified package is supported on a platform.   |
| { <b>bootflash:</b>   <b>flash:</b>   <b>ftp:</b>   <b>harddisk:</b>   <b>http:</b>   <b>https:</b>   <b>rcp:</b>   <b>scp:</b>   <b>tftp:</b>   <b>webui:</b> } |  | Specifies the package to be added.  |

|                               |   |
|-------------------------------|---|
| <b>commit</b>                 | Makes SMU changes persistent over reloads.<br><br>You can perform a commit after activating a package while the system is up, or after the first reload. If a package is activated, but not committed, it remains active after the first reload, but not after the second reload. |
| <b>auto-abort-timer stop</b>  | Stops the auto-abort timer.   |
| <b>deactivate</b>             | Deactivates an installed package.<br><br><b>Note</b> Deactivating a package also updates the package status and might trigger a process restart or reload.  |
| <b>label</b> <i>id</i>        | Specifies the ID of the install point to label.   |
| <b>description</b>            | Adds a description to the specified install point.  |
| <b>label-name</b> <i>name</i> | Adds a label name to the specified install point.   |
| <b>remove</b>                 | Removes the installed packages.<br><br>The <b>remove</b> keyword can only be used on packages that are currently inactive.  |
| <b>inactive</b>               | Removes all the inactive packages from the device.  |
| <b>rollback</b>               | Rolls back the data model interface (DMI) package SMU to the base version, the last committed version, or a known commit ID.  |
| <b>to base</b>                | Returns to the base image.  |
| <b>committed</b>              | Returns to the installation state when the last commit operation was performed.   |
| <b>id</b> <i>install-ID</i>   | Returns to the specific install point ID. Valid values are from 1 to 4294967295.  |

**Command Default**

Packages are not installed.

**Command Modes**

Privileged EXEC (#)

**Command History**

| <b>Release</b>              | <b>Modification</b>   |
|-----------------------------|---|
| Cisco IOS XE Everest 16.6.1 | This command was introduced.  |
| Cisco IOS XE Fuji 16.9.1    | Hot-patching support is introduced. Sample output updated with hot SMU outputs. |



## Usage Guidelines

An SMU is a package that can be installed on a system to provide a patch fix or security resolution to a released image. This package contains a minimal set of files for patching the release along with metadata that describes the contents of the package.

Packages must be added before the SMU is activated.

A package must be deactivated before it is removed from Flash. A removed packaged must be added again.

The following example shows how to add an install package to a device:

```
Device# install add file
flash:cat9k_iosxe.BLD_SMU_20180302_085005_TWIG_LATEST_20180306_013805.3.SSA.smu.bin

install_add: START Mon Mar  5 21:48:51 PST 2018
install_add: Adding SMU

--- Starting initial file syncing ---
Info: Finished copying
flash:cat9k_iosxe.BLD_SMU_20180302_085005_TWIG_LATEST_20180306_013805.3.SSA.smu.bin to the
selected switch(es)
Finished initial file syncing

Executing pre scripts....

Executing pre scripts done.
--- Starting SMU Add operation ---
Performing SMU_ADD on all members
  [1] SMU_ADD package(s) on switch 1
  [1] Finished SMU_ADD on switch 1
Checking status of SMU_ADD on [1]
SMU_ADD: Passed on [1]
Finished SMU Add operation

SUCCESS: install_add
/flash/cat9k_iosxe.BLD_SMU_20180302_085005_TWIG_LATEST_20180306_013805.3.SSA.smu.bin Mon
Mar  5 21:49:00 PST 2018
```

The following example shows how to activate an install package:

```
Device# install activate file
flash:cat9k_iosxe.BLD_SMU_20180302_085005_TWIG_LATEST_20180306_013805.3.SSA.smu.bin

install_activate: START Mon Mar  5 21:49:22 PST 2018
install_activate: Activating SMU
Executing pre scripts....

Executing pre sripts done.

--- Starting SMU Activate operation ---
Performing SMU_ACTIVATE on all members
  [1] SMU_ACTIVATE package(s) on switch 1
  [1] Finished SMU_ACTIVATE on switch 1
Checking status of SMU_ACTIVATE on [1]
SMU_ACTIVATE: Passed on [1]
Finished SMU Activate operation

SUCCESS: install_activate
/flash/cat9k_iosxe.BLD_SMU_20180302_085005_TWIG_LATEST_20180306_013805.3.SSA.smu.bin Mon
Mar  5 21:49:34 PST 2018
```

The following example shows how to commit an installed package:

```

Device# install commit

install_commit: START Mon Mar  5 21:50:52 PST 2018
install_commit: Committing SMU
Executing pre scripts....

Executing pre sripts done.
--- Starting SMU Commit operation ---
Performing SMU_COMMIT on all members
  [1] SMU_COMMIT package(s) on switch 1
  [1] Finished SMU_COMMIT on switch 1
Checking status of SMU_COMMIT on [1]
SMU_COMMIT: Passed on [1]
Finished SMU Commit operation

SUCCESS: install_commit
/flash/cat9k_iosxe.BLD_SMU_20180302_085005_TWIG_LATEST_20180306_013805.3.SSA.smu.bin Mon
Mar  5 21:51:01 PST 2018

```

**Related Commands**

| Command             | Description                                      |
|---------------------|--|
| <b>show install</b> | Displays information about the install packages. |

# ip http banner

To enable the HTTP or HTTP Secure (HTTPS) server banner, use the **ip http banner** command in global configuration mode. To disable the HTTP or HTTPS server banner, use the **no** form of this command.

**ip http banner**  
**no ip http banner**

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

**Command Default** The HTTP or HTTPS server banner is not enabled.

**Command Modes** Global configuration (config)

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** While the HTTP server processes a request, if the session ID is invalid or expired, the server redirects the user to a banner page. The banner page allows the user to log in with credentials. The server validates the credentials and processes the request.

## Examples

The following example shows how to enable the HTTP or HTTPS server banner:

```
Device> enable
Device# configure terminal
Device(config)# ip http banner
Device(config)# end
```

| Related Commands | Command                    | Description   |
|------------------|----------------------------|---|
|                  | <b>ip http banner-path</b> | Sets a custom path for the HTTP or HTTPS banner page. |

# ip http banner-path

To set a custom path for the HTTP or HTTP Secure (HTTPS) banner page, use the **ip http banner-path** command in global configuration mode. To disable the custom path for the HTTP or HTTPS banner page, use the **no** form of this command.

**ip http banner-path** *path-name*  
**no ip http banner-path** *path-name*

|                           |  |
|---------------------------|--|
| <b>Syntax Description</b> | <i>path-name</i> Custom path for the HTTP or HTTPS banner. |
|---------------------------|--|

**Command Default** The custom path for the HTTP or HTTPS banner is not set.

**Command Modes** Global configuration (config)

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** Use the **ip http banner-path** command to direct the user to the banner path. If the command is not configured or if the custom banner path does not exist, the server directs the user to the default banner page.

**Examples** The following example shows how to set the path to the HTTP or HTTPS banner page:

```
Device> enable
Device# configure terminal
Device(config)# ip http banner-path welcome
Device(config)# end
```

| <b>Related Commands</b> | <b>Command</b>        | <b>Description</b>                       |
|-------------------------|-----------------------|--|
|                         | <b>ip http banner</b> | Enables the HTTP or HTTPS server banner. |

# ip ssh bulk-mode

To enable the Secure Shell (SSH) bulk data transfer mode, use the **ip ssh bulk-mode** command in global configuration mode. To disable this mode, use the **no** form of this command.

**ip ssh bulk-mode**  
**no ip ssh bulk-mode**

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

**Command Default** SSH bulk mode is not enabled.

**Command Modes** Global configuration (config)

| Command History | Release                       | Modification                 |
|-----------------|-------------------------------|------------------------------|
|                 | Cisco IOS XE Amsterdam 17.2.1 | This command was introduced. |

**Usage Guidelines** SSH bulk mode enables optimizing the throughput performance of procedures that involve the transfer of large amounts of data. Secure Copy feature has been enhanced to leverage bulk mode optimizations. We recommend that you enable the **ip ssh bulk-mode** command for transferring large files only because this operation consumes more system resources such as, CPU and memory, compared to other file transfer operations. Do not use this command when the system resources are heavily loaded, and disable this command after the required file transfers are completed.



- Note**
- Bulk data transfer mode does not support the time or volume-based SSH rekey functionality.
  - Bulk data transfer mode is not supported with SSH Version 1.
  - Do not configure the **ip ssh window-size** command if the **ip ssh bulk-mode** command is enabled.

## Examples

The following example shows how to enable bulk data transfer mode on an SSH server:

```
Device> enable
Device# configure terminal
Device(config)# ip ssh bulk-mode
Device(config)# exit
```

# I2 traceroute

To enable the Layer 2 traceroute server, use the **I2 traceroute** command in global configuration mode. Use the **no** form of this command to disable the Layer 2 traceroute server.

**I2 traceroute**  
**no I2 traceroute**

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

**Command Modes** Global configuration (config#)

| Command History | Release                      | Modification                |
|-----------------|------------------------------|-----------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | The command was introduced. |

**Usage Guidelines** Layer 2 traceroute is enabled by default and opens a listening socket on User Datagram Protocol (UDP) port 2228. To close the UDP port 2228 and disable Layer 2 traceroute, use the **no I2 traceroute** command in global configuration mode.

The following example shows how to configure Layer 2 traceroute using the **I2 traceroute** command.

```
Device# configure terminal
Device(config)# I2 traceroute
```

# license air level

To configure AIR licenses on a wireless controller that is connected to Cisco Catalyst Access, Core, and Aggregation Switches, enter the **license air level** command in global configuration mode. To revert to the default setting, use the **no** form of this command.

**license air level** { **air-network-advantage** [ **addon air-dna-advantage** ] | **air-network-essentials** [ **addon air-dna-essentials** ] }

**no license air level**

## Syntax Description

|                                 |  |
|---------------------------------|--|
| <b>air-network-advantage</b>    | Configures the AIR network advantage license level.  |
| <b>addon air-dna-advantage</b>  | (Optional) Configures the add-on AIR DNA advantage license level.<br>This add-on option is available with the AIR network advantage license, and is the default license. |
| <b>air-network-essentials</b>   | Configures the AIR network essential license level.  |
| <b>addon air-dna-essentials</b> | (Optional) Configures the add-on AIR DNA essentials license level.<br>This add-on option is available with the AIR network essential license.                            |

## Command Default

AIR DNA Advantage is the default license

## Command Modes

Global configuration (Device(config)# )

## Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Gibraltar 16.10.1 | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | This command continues to be available and applicable with the introduction of Smart Licensing Using Policy in this release. See the <i>Usage Guidelines</i> section below for details. |

## Usage Guidelines

In the Smart Licensing Using Policy environment, you can use the **license air level** command to change the license level being used on the product instance, or to additionally configure an add-on license on the product instance. The change is effective after a reload.

The licenses that can be configured are:

- AIR Network Essential
- AIR Network Advantage
- AIR DNA Essential
- AIR DNA Advantage

You can configure AIR DNA Essential or AIR DNA Advantage license level, and on term expiry, you can move to the Network Advantage or Network Essentials license level, if you do not want to renew the DNA license.

Every connecting Access Point requires a Cisco DNA Center License to leverage the unique value properties of the controller.

For more information, see the [Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide](#) for the required release.

### Examples

The following example shows how to configure the AIR DNA Essential license level:

```
Device# configure terminal
Device(config)# license air level network-essentials addon air-dna-essentials
```

The following example shows how to configure the AIR DNA Advantage license level:

```
Device# configure terminal
Device(config)# license air level air-network-advantage addon air-dna-advantage
```



# license boot level

To boot a new software license on the device, use the **license boot level** command in global configuration mode. Use the **no** form of this command to remove all software licenses from the device.

```
license boot level { network-advantage [ addon dna-advantage ] | network-essentials [ addon dna-essentials ] }
```

```
no license boot level
```

## Syntax Description

|   |  |
|---|--|
| <b>network-advantage</b> [ <b>addon dna-advantage</b> ]   | Configures the Network Advantage license.<br>Optionally, you can also configure the Digital Networking Architecture (DNA) Advantage license.   |
| <b>network-essentials</b> [ <b>addon dna-essentials</b> ] | Configures the Network Essentials license.<br>Optionally, you can also configure the Digital Networking Architecture (DNA) Essentials license. |

## Command Default

Network Essentials

## Command Modes

Global configuration (config)

## Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | This command continues to be available and applicable with the introduction of Smart Licensing Using Policy in this release. See the <i>Usage Guidelines</i> section below for details. |

## Usage Guidelines

The software features available on Cisco Catalyst 9000 Series Switches fall under these base or add-on license levels:

Base Licenses:

- Network Essentials
- Network Advantage—Includes features available with the Network Essentials license and more.

Add-on Licenses:

- DNA Essentials
- DNA Advantage—Includes features available with the Network Essentials license and more.

Base licenses are permanent or perpetual licenses.

Add-on licenses are subscription or term licenses and can be purchased for a three, five, or seven year period. Base licenses are a prerequisite for add-on licenses. See the release notes for more information about this.

The sections below provide information about using the **license boot level** command in the earlier Smart Licensing environment, and in the Smart Licensing Using Policy environment.

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, Smart Licensing Using Policy is enabled by default and you can use the **license boot level** command for these purposes:

- To change the base or add-on license levels being used on the product instance.  
For example, if you are using Network Essentials and you want to use Network Advantage with the next reload, or if you are using DNA Advantage and you want to use DNA Essentials with the next reload.
- To add or remove add-on license levels being used on the product instance.  
For example, if you are using only Network Essentials and you want to use DNA Essentials with the next reload, or if you are using DNA Advantage and you do not want to use the add-on after the next reload.

The notion of evaluation or expired licenses does not exist in Smart Licensing Using Policy.

After the command is configured, the configured license is effective after the next reload. License usage continues to be recorded on device and this changed licensing consumption information may have to be sent via the next Resource Utilization Measurement Report (RUM report) to CSSM. The reporting requirements and frequency are determined by the policy that is applied. See the `Usage Reporting:` section of the **show license status** command output. For more information about Smart Licensing Using Policy, in the software configuration guide of the required release, see *System Management > Smart Licensing Using Policy*.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, Smart Licensing is enabled by default you can use the **license boot level** command for these purposes:

- Downgrade or upgrade licenses
- Enable or disable an evaluation or extension license
- Clear an upgrade license

This command forces the licensing infrastructure to boot the configured license level instead of the license hierarchy maintained by the licensing infrastructure for a given module:

- When the switch reloads, the licensing infrastructure checks the configuration in the startup configuration for licenses, if any. If there is a license in the configuration, the switch boots with that license. If there is no license, the licensing infrastructure follows the image hierarchy to check for licenses.
- If the forced boot evaluation license expires, the licensing infrastructure follows the regular hierarchy to check for licenses.
- If the configured boot license has already expired, the licensing infrastructure follows the hierarchy to check for licenses.

The following example shows how to configure the Network Essentials license at the next reload:

```
Device# configure terminal
Device(config)# license boot level network-essentials
Device(config)# exit
Device# copy running-config startup-config
Device# reload
```

The following example shows how to activate the DNA Essentials license at the next reload:

```
Device# configure terminal  
Device(config)# license boot level network-essentials add-on dna-essentials  
Device(config)# exit  
Device# copy running-config startup-config  
Device# reload
```

## license smart (global config)

To configure licensing-related settings such as the mode of transport and the URL that the product instance uses to communicate with Cisco Smart Software Manager (CSSM), or Cisco Smart Licensing Utility (CSLU), or Smart Software Manager On-Prem (SSM On-Prem), to configure the usage reporting interval, to configure the information that must be excluded or included in a license usage report (RUM report), enter the **license smart** command in global configuration mode. Use the **no** form of the command to revert to default values.

```
license smart { custom_id ID | enable | privacy { all | hostname | version } | proxy { address
address_hostname | port port } | reservation | server-identity-check | transport { automatic | callhome
| cslu | off | smart } | url { url | cslu cslu_or_on-prem_url | default | smart smart_url | utility secondary_url
} | usage { customer-tags { tag1 | tag2 | tag3 | tag4 } tag_value | interval interval_in_days } | utility [
customer_info { city city | country country | postalcode postalcode | state state | street street } ] }
```

```
no license smart { custom_id | enable | privacy { all | hostname | version } | proxy { address
address_hostname | port port } | reservation | server-identity-check | transport | url { url | cslu
cslu_or_on-prem_url | default | smart smart_url | utility secondary_url } | usage { customer-tags { tag1
| tag2 | tag3 | tag4 } tag_value | interval interval_in_days } | utility [ customer_info { city city | country
country | postalcode postalcode | state state | street street } ] }
```

| Syntax Description   |   |
|--|---|
| <b>custom_id</b> <i>ID</i>                                       | Although available on the CLI, this option is not supported.  |
| <b>enable</b>  | Although visible on the CLI, configuring this keyword has no effect. Smart licensing is always enabled.   |
| <b>privacy</b> { <b>all</b>   <b>hostname</b>   <b>version</b> } | <p>Enables you to <i>leave out</i> certain information from the usage reports that are sent to CSSM. Choose from the following options:</p> <ul style="list-style-type: none"> <li>• <b>all</b>: Sends only the minimal licensing information in any communication.</li> <li>• <b>hostname</b>: Excludes the hostname from any communication.</li> <li>• <b>version</b>: Excludes the product instance agent version from any communication.</li> </ul> |

---

**proxy** { **address** *address\_hostname* | **port** *port* }  
 Configures a proxy for license usage synchronization with CSLU or CSSM. This means that you can use this option to configure a proxy only if the transport mode is **license smart transport smart** (CSSM), or **license smart transport cslu** (CSLU).

However, you cannot configure a proxy for license usage synchronization in an SSM On-Prem deployment, which also uses **license smart transport cslu** as the transport mode.

Configure the following options:

- **address** *address\_hostname*: Configures the proxy address.

For *address\_hostname*, enter the IP address or hostname of the proxy.

- **port***port*: Configures the proxy port.

For *port*, enter the proxy port number.

---

**reservation** Enables or disables a license reservation feature.

**Note** Although available on the CLI, this option is not applicable because license *reservation* is not applicable in the Smart Licensing Using Policy environment.

---

**server-identity-check** Enables or disables the HTTP secure server identity check.

---

**transport** { **automatic** | **callhome** | **cslu** | **off** | **smart** }  
 Configures the mode of transport the product instance uses to communicate with CSSM. Choose from the following options:

- **automatic**: Sets the transport mode **cslu**.
- **callhome**: Enables Call Home as the transport mode.
- **cslu**: Enables CSLU as the transport mode. This is the default transport mode.

The same keyword applies to both CSLU *and* SSM On-Prem, but the URLs are different. See **cslu***cslu\_or\_on-prem\_url* in the following row.

- **off**: Disables all communication from the product instance.
  - **smart**: Enables Smart transport.
-

---

```
url { url | cslu cslu_url | default | smart  
smart_url | utility secondary_url }
```

---

Sets a URL for the configured transport mode. Choose from the following options:

- **url**: If you have configured the transport mode as **callhome**, configure this option. Enter the CSSM URL exactly as follows:

```
https://tools.cisco.com/its/service/odbc/services/DCEService
```

The **no license smart url url** command reverts to the default URL.

- **cslu cslu\_or\_on-prem\_url**: If you have configured the transport mode as **cslu**, configure this option, with the URL for CSLU or SSM On-Prem, as applicable:

- If you are using CSLU, enter the URL as follows:

```
http://<cslu_ip_or_host>:8182/cslu/v1/pi
```

For <cslu\_ip\_or\_host>, enter the hostname or the IP address of the windows host where you have installed CSLU. 8182 is the port number and it is the only port number that CSLU uses.

The **no license smart url cslu**

**cslu\_or\_on-prem\_url** command reverts to

```
http://cslu-local:8182/cslu/v1/pi
```

- If you are using SSM On-Prem, enter the URL as follows:

```
http://<ip>/cslu/v1/pi/<tenant ID>
```

For <ip>, enter the hostname or the IP address of the server where you have installed SSM On-Prem. The <tenantID> must be the default local virtual account ID.

**Tip**

You can retrieve the entire URL from SSM On-Prem. In the software configuration guide of the required release (17.3.x onwards), see *System Management > Smart Licensing Using Policy > Task Library for Smart Licensing Using Policy > Retrieving the Transport URL (SSM On-Prem UI)*.

The **no license smart url cslu**

**cslu\_or\_on-prem\_url** command reverts to

```
http://cslu-local:8182/cslu/v1/pi
```

- **default**: Depends on the configured transport mode. Only the **smart** and **cslu** transport modes are supported with this option.

If the transport mode is set to **cslu**, and you configure

**license smart url default**, the CSLU URL is configured automatically

(<https://cslu-local:8182/cslu/v1/pi>).

If the transport mode is set to **smart**, and you configure **license smart url default**, the Smart URL is configured automatically

(<https://smartreceiver.cisco.com/licservice/license>).

- **smart** *smart\_url*: If you have configured the transport type as **smart**, configure this option. Enter the URL exactly as follows:

<https://smartreceiver.cisco.com/licservice/license>

When you configure this option, the system automatically creates a duplicate of the URL in **license smart url url**. You can ignore the duplicate entry, no further action is required.

The **no license smart url smartsmart\_url** command reverts to the default URL.

- **utility** *smart\_url*: Although available on the CLI, this option is not supported.
-



---

**usage** { **customer-tags** { **tag1** | **tag2** | **tag3** | **tag4** } *tag\_value* | **interval** *interval\_in\_days* } Configures usage reporting settings. You can set the following options:

- **customer-tags** { **tag1** | **tag2** | **tag3** | **tag4** } *tag\_value*: Defines strings for inclusion in data models, for telemetry. Up to 4 strings (or tags) may be defined.  
For *tag\_value*, enter the string value for each tag that you define.
- **interval** *interval\_in\_days*: Sets the reporting interval in days. By default the RUM report is sent every 30 days. The valid value range is 1 to 3650.

If you set the value to zero, RUM reports are not sent, regardless of what the applied policy specifies - this applies to topologies where CSLU or CSSM may be on the receiving end.

If you set a value that is greater than zero and the transport type is set to **off**, then, between the *interval\_in\_days* and the policy value for `Ongoing reporting frequency(days)`, the lower of the two values is applied. For example, if *interval\_in\_days* is set to 100, and the value in the in the policy says `Ongoing reporting frequency (days):90`, RUM reports are sent every 90 days.

If you do not set an interval, and the default is effective, the reporting interval is determined entirely by the policy value. For example, if the default value is effective and only unenforced licenses are in use, if the policy states that reporting is not required, then RUM reports are not sent.

---

**utility** [ **customer\_info** { **city** *city* | **country** *country* | **postalcode** *postalcode* | **state** *state* | **street** *street* } ] Although visible on the CLI, this option is not supported.

---



---

#### Command Default

Cisco IOS XE Amsterdam 17.3.1 or earlier: Smart Licensing is enabled by default  
Cisco IOS XE Amsterdam 17.3.2a and later: Smart Licensing Using Policy is enabled by default.

---

#### Command Modes

Global config (Device(config)#)

---

#### Command History

| Release                  | Modification                 |
|--------------------------|------------------------------|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

---

| Release                           | Modification   |
|-----------------------------------|--|
| Cisco IOS XE<br>Amsterdam 17.3.2a | <p>The following keywords and variables were introduced with Smart Licensing Using Policy:</p> <ul style="list-style-type: none"> <li>Under the <b>url</b> keyword, these options were introduced: <ul style="list-style-type: none"> <li>{ <b>cslu</b> <i>cslu_url</i>   <b>smart</b> <i>smart_url</i> }</li> </ul> </li> <li>Under the <b>transport</b> keyword, these options were introduced: <ul style="list-style-type: none"> <li>{ <b>cslu</b>   <b>off</b> }</li> </ul> </li> </ul> <p>Further, the default transport type was changed from <b>callhome</b>, to <b>cslu</b>.</p> <ul style="list-style-type: none"> <li><b>usage</b> { <b>customer-tags</b> { <b>tag1</b>   <b>tag2</b>   <b>tag3</b>   <b>tag4</b> } <i>tag_value</i>   <b>interval</b> <i>interval_in_days</i> }</li> </ul> <p>The following keywords and variables under the <b>license smart</b> global command are deprecated and no longer available on the CLI: <b>enable</b> and <b>conversion automatic</b>.</p> |
| Cisco IOS XE<br>Amsterdam 17.3.3  | <p>SSM On-Prem support was introduced. For product instance-initiated communication in an SSM On-Prem deployment, the existing [<b>no</b>] <b>license smart url cslu</b> <i>cslu_or_on-prem_url</i> command supports the configuration of a URL for SSM On-Prem as well. But the required URL format for SSM On-Prem is:</p> <pre>http://&lt;ip&gt;/cslu/v1/pi/&lt;tenant ID&gt;.</pre> <p>The corresponding transport mode that must be configured is also an existing command (<b>license smart transport cslu</b>).</p>   |

## Usage Guidelines

The reporting interval that you configure (**license smart usage interval** *interval\_in\_days* command), determines the date and time at which the product instance sends out the RUM report. If the scheduled interval coincides with a communication failure, the product instance attempts to send out the RUM report for up to four hours after the scheduled time has expired. If it is still unable to send out the report (because the communication failure persists), the system resets the interval to 15 minutes. Once the communication failure is resolved, the system reverts the reporting interval to the value that you last configured.

The system message you may see in case of a communication failure is %SMART\_LIC-3-COMM\_FAILED. For information about resolving this error and restoring the reporting interval value, in the software configuration guide of the required release (17.3.x onwards), see *System Management > Smart Licensing Using Policy > Troubleshooting Smart Licensing Using Policy*.

- [Examples for Data Privacy, on page 50](#)
- [Examples for Transport Type and URL, on page 51](#)
- [Examples for Usage Reporting Options, on page 52](#)

## Examples for Data Privacy

The following examples show how to configure data privacy related information using **license smart privacy** command in global configuration mode. The accompanying **show license status** output displays configured information.

No private information is sent:

```
Device# configure terminal
Device(config)# license smart privacy all
Device(config)# license smart transport callhome
Device(config)# license smart url
https://tools.cisco.com/its/service/oddce/services/DDCEService
Device(config)# exit
Device# show license status
<output truncated>
Data Privacy:
  Sending Hostname: no
  Callhome hostname privacy: ENABLED
  Smart Licensing hostname privacy: ENABLED
  Version privacy: ENABLED

Transport:
  Type: Callhome
<output truncated>
```

Agent version on the product instance is not sent:

```
Device# configure terminal
Device(config)# license smart privacy version
Device(config)# license smart transport callhome
Device(config)# license smart url
https://tools.cisco.com/its/service/oddce/services/DDCEService
Device(config)# exit
Device# show license status
<output truncated>
Data Privacy:
  Sending Hostname: yes
  Callhome hostname privacy: DISABLED
  Smart Licensing hostname privacy: DISABLED
  Version privacy: ENABLED

Transport:
  Type: Callhome
<output truncated>
```

### Examples for Transport Type and URL

The following examples show how to configure some of the transport types using the **license smart transport** and the **license smart url** commands in global configuration mode. The accompanying **show license all** output displays configured information.

Transport: **cslu**:

```
Device# configure terminal
Device(config)# license smart transport cslu
Device(config)# license smart url default
Device(config)# exit
Device# show license all
<output truncated>
Transport:
  Type: cslu
  Cslu address: http://192.168.0.1:8182/cslu/v1/pi
  Proxy:
    Not Configured
<output truncated>
```

Transport: **smart**:

```

Device# configure terminal
Device(config)# license smart transport smart
Device(config)# license smart url smart https://smartreceiver.cisco.com/licservice/license
Device(config)# exit
Device# show license all
<output truncated>
Transport:
  Type: Smart
  URL: https://smartreceiver-stage.cisco.com/licservice/license
  Proxy:
    Not Configured
<output truncated>

```

### Examples for Usage Reporting Options

The following examples show how to configure some of the usage reporting settings using the **license smart usage** command in global configuration mode. The accompanying **show running-config** output displays configured information.

Configuring the **customer-tag** option:

```

Device# configure terminal
Device(config)# license smart usage customer-tags tag1 SA/VA:01
Device(config)# exit
Device# show running-config | include tag1
license smart usage customer-tags tag1 SA/VA:01

```

Configuring a narrower reporting interval than the currently applied policy:

```

Device# show license status
<output truncated>
Usage Reporting:
Last ACK received: Sep 22 13:49:38 2020 PST
Next ACK deadline: Dec 21 12:02:21 2020 PST
Reporting push interval: 30 days
Next ACK push check: Sep 22 12:20:34 2020 PST
Next report push: Oct 22 12:05:43 2020 PST
Last report push: Sep 22 12:05:43 2020 PST
Last report file write: <none>
<output truncated>

Device# configure terminal
Device(config)# license smart usage interval 20
Device(config)# exit
Device# show license status
<output truncated>

Usage Reporting:
Last ACK received: Sep 22 13:49:38 2020 PST
Next ACK deadline: Nov 22 12:02:21 2020 PST
Reporting push interval: 20 days
Next ACK push check: Sep 22 12:20:34 2020 PST
Next report push: Oct 12 12:05:43 2020 PST
Last report push: Sep 22 12:05:43 2020 PST
Last report file write: <none>
<output truncated>

```

## license smart (privileged EXEC)

To configure licensing functions such as requesting or returning authorization codes, saving Resource Utilization Measurement reports (RUM reports), importing a file on to a product instance, establishing trust with Cisco Smart Software Manager (CSSM), synchronizing the product instance with CSSM, or Cisco Smart License Utility (CSLU), or Smart Software Manager On-Prem (SSM On-Prem), and removing licensing information from the product instance, enter the **license smart** command in privileged EXEC mode with the corresponding keyword or argument.

```
license smart { authorization { request { add | replace } feature_name { all | local } | return { all | local } { offline [ path ] | online } } | clear eventlog | export return { all | local } feature_name | factory reset | import file_path | save { trust-request filepath_filename | usage { all | days days | rum-id rum-ID | unreported } { file file_path } } | sync { all | local } | trust idtoken id_token_value { local | all } [ { force } ] }
```

| Syntax Description | smart                           | Provides options for Smart Licensing.  |
|--------------------|---------------------------------|--|
|                    | <b>authorization</b>            | Provides the option to request for, or return, authorization codes.<br><br>Authorization codes are required <i>only</i> if you use licenses with enforcement type: export-controlled or enforced.  |
|                    | <b>request</b>                  | Requests an authorization code from CSSM, CSLU (CSLU in-turn fetches it from CSSM), or SSM On-Prem and installs it on the product instance.  |
|                    | <b>add</b>                      | Adds the requested license to the existing authorization code. The new authorization code will contain all the licenses of the existing authorization code and the requested license.  |
|                    | <b>replace</b>                  | Replaces the existing authorization code. The new authorization code will contain only the requested license. All licenses in the current authorization code are returned.<br><br>When you enter this option, the product instance verifies if licenses that correspond to the authorization codes that will be removed, are in-use. If licenses are being used, an error message tells you to first disable the corresponding features.                               |
|                    | <i>feature_name</i>             | Name of the license for which you are requesting an authorization code.  |
|                    | <b>all</b>                      | Performs the action for all product instances in a High Availability configuration.  |
|                    | <b>local</b>                    | Performs the action for the <i>active</i> product instance. This is the default option.  |
|                    | <b>return</b>                   | Returns an authorization code back to the license pool in CSSM.  |
|                    | <b>offline</b> <i>file_path</i> | Means the product instance is not connected to CSSM. The authorization code is returned offline. This option requires you to print the return code to a file.<br><br>Optionally, you can also specify a path to save the file. The file format can be any readable format, such as <code>.txt</code><br><br>If you choose the offline option, you must complete the additional step of copying the return code from the CLI or the saved file and entering it in CSSM. |

|  |  |
|--|--|
| <b>online</b>  | Means that the product instance is in a connected mode. The authorization code is returned to CSLU or CSSM directly.   |
| <b>clear eventlog</b>  | Clears all event log files from the product instance.  |
| <b>export return</b>   | Returns the authorization key for an export-controlled license.  |
| <b>factory reset</b>   | Clears all saved licensing information from the product instance.  |
| <b>import</b><br><i>filepath_filename</i>  | Imports a file on to the product instance. The file may be that of an authorization code, a trust code, or, or a policy.<br><br>For <i>filepath_filename</i> , specify the location, including the filename.   |
| <b>save</b>  | Provides options to save RUM reports or trust code requests.   |
| <b>trust-request</b><br><i>filepath_filename</i>   | Saves the trust code request for the active product instance in the specified location.<br><br>For <i>filepath_filename</i> , specify the absolute path to the file, including the filename.   |
| <b>usage</b> { <b>all</b>   <b>days</b> <i>days</i>   <b>rum-id</b> <i>rum-ID</i>   <b>unreported</b> } { <b>file</b> <i>file_path</i> } | Saves RUM reports (license usage information) in the specified location. You must specify one of these options: <ul style="list-style-type: none"> <li>• <b>all</b>: Saves all RUM reports.</li> <li>• <b>days</b> <i>days</i>: Saves RUM report for the last <i>n</i> number of days (excluding the current day). Enter a number. The valid range is 0 to 4294967295.<br/><br/>For example, if you enter 3, RUM reports of the last three days are saved.</li> <li>• <b>rum-Id</b> <i>rum-ID</i>: Saves a specified RUM ID. The valid value range is 0 to 18446744073709551615.</li> <li>• <b>unreported</b>: Saves all unreported RUM reports.</li> </ul> <p><b>file</b> <i>filepath_filename</i>: Saves the specified usage information to a file. Specify the absolute path to the file, including the filename.</p> |
| <b>sync</b> { <b>all</b>   <b>local</b> }  | Synchronizes with CSSM or CSLU, or SSM On-Prem, to send and receive any pending data. This includes uploading pending RUM reports, downloading the ACK response, any pending authorization codes, trust codes, and policies for the product instance.<br><br>Specify the product instance by entering one of these options: <ul style="list-style-type: none"> <li>• <b>all</b>: Performs synchronization for all the product instances in a High Availability set-up. If you choose this option, the product instance also sends the list of all the UDIs in the synchronization request.</li> <li>• <b>local</b>: Performs synchronization only for the active product instance sending the request, that is, its own UDI. This is the default option.</li> </ul>  |
| <b>trust idtoken</b><br><i>id_token_value</i>  | Establishes a trusted connection with CSSM.<br><br>To use this option, you must first generate a token in the CSSM portal. Provide the generated token value for <i>id_token_value</i> .   |

|              |  |
|--------------|--|
| <b>force</b> | Submits a trust code request even if a trust code already exists on the product instance.<br><br>A trust code is node-locked to the UDI of a product instance. If the UDI is already registered, CSSM does not allow a new registration for the same UDI. Entering the <b>force</b> keyword overrides this behavior. |
|--------------|--|

**Command Default**

Cisco IOS XE Amsterdam 17.3.1 and earlier: Smart Licensing is enabled by default.  
Cisco IOS XE Amsterdam 17.3.2a and later: Smart Licensing Using Policy is enabled by default.

**Command Modes**

Privileged EXEC (Device#)

**Command History**

| Release                        | Modification   |
|--------------------------------|--|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.   |
| Cisco IOS XE Amsterdam 17.3.2a | <p>The following keywords and variables were introduced with Smart Licensing Using Policy:</p> <ul style="list-style-type: none"> <li>• <b>authorization</b> { <b>request</b> { <b>add</b>   <b>replace</b> } <i>feature_name</i> { <b>all</b>   <b>local</b> }   <b>return</b> { <b>all</b>   <b>local</b> } { <b>offline</b> [ <i>path</i> ]   <b>online</b> } }</li> <li>• <b>import</b> <i>file_path</i></li> <li>• <b>save</b> { <b>trust-request</b> <i>filepath_filename</i>   <b>usage</b> { <b>all</b>   <b>days</b> <i>days</i>   <b>rum-id</b> <i>rum-ID</i>   <b>unreported</b> } { <b>file</b> <i>file_path</i> } }</li> <li>• <b>sync</b> { <b>all</b>   <b>local</b> }</li> <li>• <b>trust idtoken</b> <i>id_token_value</i> { <b>local</b>   <b>all</b> } [ <b>force</b> ]</li> </ul> <p>The following keywords and variables under the <b>license smart</b> command are deprecated and no longer available on the CLI:</p> <ul style="list-style-type: none"> <li>• <b>register idtoken</b> <i>token_id</i> [ <b>force</b> ]</li> <li>• <b>deregister</b></li> <li>• <b>renew id</b> { <b>ID</b>   <b>auth</b> }</li> <li>• <b>debug</b> { <b>error</b>   <b>debug</b>   <b>trace</b>   <b>all</b> }</li> <li>• <b>mfg reservation</b> { <b>request</b>   <b>install</b>   <b>install file</b>   <b>cancel</b> }</li> <li>• <b>conversion</b> { <b>start</b>   <b>stop</b> }</li> </ul> |
| Cisco IOS XE Amsterdam 17.3.3  | Support for SSM On-Prem was introduced. You can perform licensing-related tasks such as saving Resource Utilization Measurement reports (RUM reports), importing a file on to a product instance, synchronizing the product instance, returning authorization codes, and removing licensing information from the product instance in an SSM On-Prem deployment.  |

**Usage Guidelines****Overwriting a Trust Code**

Use case for the **force** option when configuring the **license smart trust idtoken** command: You use same token for all the product instances that are part of one Virtual Account. If the product instance has moved from one account to another (for instance, because it was added to a High Availability set-up, which is part of another Virtual Account), then there may be an existing trust code you have to overwrite.

### Removing Licensing Information

Entering the **license smart factory reset** command removes all licensing information (except the licenses in-use) from the product instance, including any authorization codes, RUM reports etc. Therefore, we recommend the use of this command only if the product instance is being returned (Return Material Authorization, or RMA), or being decommissioned permanently. We also recommend that you send a RUM report to CSSM, before you remove licensing information from the product instance - this is to ensure that CSSM has up-to-date usage information.

### Authorization Codes and License Reservations:

Options relating to authorization codes and license reservations:

- Since there are no export-controlled or enforced licenses on any of the Cisco Catalyst Access, Core, and Aggregation Switches, the following commands are not applicable:
  - **license smart authorization request** { **add** | **replace** } *feature\_name* { **all** | **local** }
  - **license smart export return**
- The following option is applicable and required for any SLR authorization codes you may want to return:

```
license smart authorization return { all | local } { offline [ path ] | online }
```

### Examples

- [Example for Saving Licensing Usage Information, on page 56](#)
- [Example for Installing a Trust Code, on page 57](#)
- [Example for Returning an SLR Authorization Code, on page 57](#)

### Example for Saving Licensing Usage Information

The following example shows how you can save license usage information on the product instance. You can use this option to fulfil reporting requirements in an air-gapped network. In the example, the file is first save to flash memory and then copied to a TFTP location:

```
Device> enable
Device# license smart save usage unreported file flash:RUM-unrep.txt
Device# copy flash:RUM-unrep.txt tftp://192.168.0.1//auto/tftp-user/user01/
Address or name of remote host [192.168.0.1]?
Destination filename [//auto/tftp-user/user01/RUM-unrep.txt]?
!!
15128 bytes copied in 0.161 secs (93963 bytes/sec)
```

After you save RUM reports to a file, you must upload it to CSSM (from a workstation that has connectivity to the internet, and Cisco).



### Example for Installing a Trust Code

The following example shows how to install a trust code even if one is already installed on the product instance. This requires connectivity to CSSM. The accompanying **show license status** output shows sample output after successful installation:

Before you can install a trust code, you must generate a token and download the corresponding file from CSSM.

Use the **show license status** command (Trust Code Installed:) to verify results.

```
Device> enable
Device# license smart trust idtoken
NGMwMjk5mYtNZaxMS00NzMZmtgWm local force
Device# show license status
<output truncated>
Trust Code Installed:
  Active: PID:C9500-24Y4C,SN:CAT2344L4GH
         INSTALLED on Sep 04 01:01:46 2020 EDT
  Standby: PID:C9500-24Y4C,SN:CAT2344L4GJ
         INSTALLED on Sep 04 01:01:46 2020 EDT
<output truncated>
```

### Example for Returning an SLR Authorization Code

The following example shows how to remove and return an SLR authorization code. Here the code is returned offline (no connectivity to CSSM). The accompanying **show license all** output shows sample output after successful return:

```
Device> enable
Device# license smart authorization return local online
Enter this return code in Cisco Smart Software Manager portal:
UDI: PID:C9500-16X,SN:FCW2233A5ZV
Return code: Cr9JHx-L1x5Rj-ftwzgl-h9QZAU-LE5DT1-babWeL-FABPt9-Wr1Dn7-Rp7
Device# configure terminal
Device(config)# no license smart reservation

Device# show license all
<output truncated>
License Authorizations
=====
Overall status:
  Active: UDI: PID:C9500-16X,SN:FCW2233A5ZV
         Status: NOT INSTALLED
         Last return code: Cr9JHx-L1x5Rj-ftwzgl-h9QZAU-LE5DT1-babWeL-FABPt9-Wr1Dn7-Rp7
<output truncated>
```

Complete the additional step of copying the return code from the CLI or the saved file and entering it in CSSM.

# license smart deregister

To cancel device registration from Cisco Smart Software Manager (CSSM), use the **license smart deregister** command in privileged EXEC mode.

## license smart deregister

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

**Command Modes** Privileged EXEC (#)

| Command History | Release                        | Modification   |
|-----------------|--------------------------------|--|
|                 | Cisco IOS XE Fuji 16.9.1       | This command was introduced.   |
|                 | Cisco IOS XE Amsterdam 17.3.2a | This command was deprecated and a replacement command is not available.<br><br>With the introduction of Smart Licensing Using Policy, in this release, you do not have to register or deregister licenses. |

**Usage Guidelines** **Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, Smart Licensing Using Policy is enabled by default.

The notion of registration or deregistration does not apply. If you want to decommission the product instance, or if you want to return a device to Cisco for replacement using the RMA process, use the **license smart factory reset** command in privileged EXEC mode. This removes all Smart licensing information from the product instance, including any authorization codes, RUM reports etc. We also recommend that you send a RUM report to CSSM, before licensing information is removed from the product instance, to ensure that CSSM has up-to-date usage information.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, Smart Licensing is enabled by default. With this licensing model, you can use the **license smart deregister** command for these purposes:

- When your device is taken off the inventory
- When your device is shipped elsewhere for redeployment
- When your device is returned to Cisco for replacement using the return merchandise authorization (RMA) process

## Example

This example shows how to deregister a device from CSSM:

```
Device# license smart deregister
*Jun 25 00:20:13.291 PDT: %SMART_LIC-6-AGENT_DEREG_SUCCESS: Smart Agent for Licensing
De-registration with the Cisco Smart Software Manager or satellite was successful
*Jun 25 00:20:13.291 PDT: %SMART_LIC-5-EVAL_START: Entering evaluation period
*Jun 25 00:20:13.291 PDT: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is Not Allowed for udi PID:ISR4461/K9,SN:FDO2213A0GL
```

**Related Commands**

| <b>Command</b>                        | <b>Description</b>                       |
|---------------------------------------|--|
| <b>license smart register idtoken</b> | Registers a device in CSSM.              |
| <b>show license all</b>               | Displays entitlements information.       |
| <b>show license status</b>            | Displays compliance status of a license. |
| <b>show license summary</b>           | Displays summary of all active licenses. |
| <b>show license usage</b>             | Displays license usage information       |

# license smart register idtoken

To register a device with the token generated from Cisco Smart Software Manager (CSSM), use the **license smart register idtoken** command in privileged EXEC mode.

**license smart register idtoken** *token\_ID* {**force**}

| Syntax Description |  |   |
|--------------------|--|---|
| <i>token_ID</i>    |  | Device with the token generated from CSSM.  |
| <b>force</b>       |  | Forcefully registers your device irrespective of whether the device is registered or not. |

**Command Modes** Privileged EXEC (#)

| Command History | Release                        | Modification   |
|-----------------|--------------------------------|--|
|                 | Cisco IOS XE Fuji 16.9.1       | This command was introduced.   |
|                 | Cisco IOS XE Amsterdam 17.3.2a | This command was deprecated and a replacement command is not available.<br><br>With the introduction of Smart Licensing Using Policy, in this release, you do not have to register or deregister licenses. |

**Usage Guidelines**

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, Smart Licensing Using Policy is enabled by default.

In the earlier version of Smart Licensing, a token was used to register and connect to Cisco Smart Software Manager (CSSM) portal. ID token registration is not required in Smart Licensing Using Policy. The token generation feature is still available in CSSM, and is used establish trust when the product instance is *directly connected to CSSM*. See the **license smart trust idtoken** *id\_token\_value* option in [license smart \(privileged EXEC\)](#), on page 53, for syntax details.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, Smart Licensing is enabled by default and this command continues to be applicable.

## Example

This example shows how to register a device on CSSM:

```
Device# license smart register idtoken
$T14UytrNXBzbeS1ck8veUtWaG5abnZJOFdDa1FwbVRa%0Ab1RMbz0%3D%0A
Registration process is in progress. Use the 'show license status' command to check the
progress and result
Device#% Generating 2048 bit RSA keys, keys will be exportable...
[OK] (elapsed time was 0 seconds)
```

| Related Commands | Command                         | Description                                |
|------------------|---------------------------------|--|
|                  | <b>license smart deregister</b> | Cancels the device registration from CSSM. |

| <b>Command</b>              | <b>Description</b>                       |
|-----------------------------|--|
| <b>show license all</b>     | Displays entitlements information.       |
| <b>show license status</b>  | Displays compliance status of a license. |
| <b>show license summary</b> | Displays summary of all active licenses. |
| <b>show license usage</b>   | Displays license usage information       |

# license smart renew

To manually renew your device's ID or authorization with Cisco Smart Software Manager (CSSM), use the **license smart renew** command in privileged EXEC mode.

**license smart renew** {**auth** | **id**}

| Syntax Description | auth | Renews your authorization. |
|--------------------|------|----------------------------|
|                    | id   | Renews your ID.            |

**Command Modes** Privileged EXEC (#)

| Command History | Release                        | Modification  |
|-----------------|--------------------------------|---|
|                 | Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
|                 | Cisco IOS XE Amsterdam 17.3.2a | This command was deprecated.<br><br>With the introduction of Smart Licensing Using Policy, you do not have to renew licenses, and a replacement command is not available. |

**Usage Guidelines** **Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, Smart Licensing Using Policy is enabled by default.

You do not have to renew licenses in this version of the licensing model. All licenses are IN-USE and you only have to send license usage information (Resource Utilization Measurement Report) to CSSM. License usage is recorded on your device with timestamps and the required reporting workflows can be completed at a later date. The method you use to report usage depends on the topology you implement. The reporting requirements and frequency are determined by the policy that is applied. For more information, in the software configuration guide of the required release, see *System Management > Smart Licensing Using Policy*.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, Smart Licensing is enabled by default. This

Authorization periods are renewed by the smart licensing system every 30 days. As long as the license is in an *Authorized* or *Out of compliance* state, the authorization period is renewed. The grace period starts when an authorization period expires. During the grace period or when the license is in the *Expired* state, the system continues to try and renew the authorization period. If a retry is successful, a new authorization period starts.

## Example

This example shows how to renew a device license:

```
Device# license smart renew auth
```

| Related Commands | Command          | Description                        |
|------------------|------------------|------------------------------------|
|                  | show license all | Displays entitlements information. |

| <b>Command</b>             | <b>Description</b>                       |
|----------------------------|--|
| <b>show license status</b> | Displays compliance status of a license. |
| <b>show license usage</b>  | Displays license usage information       |

# location

To configure location information for an endpoint, use the **location** command in global configuration mode. To remove the location information, use the **no** form of this command.

```
location {admin-tag string | civic-location identifier {hostid} | civic-location identifier {hostid} |
elin-location {string | identifier id} | geo-location identifier {hostid} | prefer {cdp weight
priority-value | lldp-med weight priority-value | static config weight priority-value}
no location {admin-tag string | civic-location identifier {hostid} | civic-location identifier {hostid} |
elin-location {string | identifier id} | geo-location identifier {hostid} | prefer {cdp weight
priority-value | lldp-med weight priority-value | static config weight priority-value}
```

## Syntax Description

|                                |  |
|--------------------------------|--|
| <b>admin-tag</b> <i>string</i> | Configures administrative tag or site information. Site or location information in alphanumeric format.  |
| <b>civic-location</b>          | Configures civic location information.   |
| <b>identifier</b>              | Specifies the name of the civic location, emergency, or geographical location.   |
| <b>host</b>                    | Defines the host civic or geo-spatial location.  |
| <i>id</i>                      | Name of the civic, emergency, or geographical location.<br><br><b>Note</b> The identifier for the civic location in the LLDP-MED switch TLV is limited to 250 bytes or less. To avoid error messages about available buffer space during switch configuration, be sure that the total length of all civic-location information specified for each civic-location identifier does not exceed 250 bytes. |
| <b>elin-location</b>           | Configures emergency location information (ELIN).  |
| <b>geo-location</b>            | Configures geo-spatial location information.   |
| <b>prefer</b>                  | Sets location information source priority.   |

## Command Default

No default behavior or values.

## Command Modes

Global configuration

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

After entering the **location civic-location identifier** global configuration command, you enter civic location configuration mode. After entering the **location geo-location identifier** global configuration command, you enter geo location configuration mode.



The civic-location identifier must not exceed 250 bytes.

The host identifier configures the host civic or geo-spatial location. If the identifier is not a host, the identifier only defines a civic location or geo-spatial template that can be referenced on the interface.

The **host** keyword defines the device location. The civic location options available for configuration using the **identifier** and the **host** keyword are the same. You can specify the following civic location options in civic location configuration mode:

- **additional-code**—Sets an additional civic location code.
- **additional-location-information**—Sets additional civic location information.
- **branch-road-name**—Sets the branch road name.
- **building**—Sets building information.
- **city**—Sets the city name.
- **country**—Sets the two-letter ISO 3166 country code.
- **county**—Sets the county name.
- **default**—Sets a command to its defaults.
- **division**—Sets the city division name.
- **exit**—Exits from the civic location configuration mode.
- **floor**—Sets the floor number.
- **landmark**—Sets landmark information.
- **leading-street-dir**—Sets the leading street direction.
- **name**—Sets the resident name.
- **neighborhood**—Sets neighborhood information.
- **no**—Negates the specified civic location data and sets the default value.
- **number**—Sets the street number.
- **post-office-box**—Sets the post office box.
- **postal-code**—Sets the postal code.
- **postal-community-name**—Sets the postal community name.
- **primary-road-name**—Sets the primary road name.
- **road-section**—Sets the road section.
- **room**—Sets room information.
- **seat**—Sets seat information.
- **state**—Sets the state name.
- **street-group**—Sets the street group.
- **street-name-postmodifier**—Sets the street name postmodifier.
- **street-name-premodifier**—Sets the street name premodifier.
- **street-number-suffix**—Sets the street number suffix.
- **street-suffix**—Sets the street suffix.
- **sub-branch-road-name**—Sets the sub-branch road name.
- **trailing-street-suffix**—Sets the trailing street suffix.
- **type-of-place**—Sets the type of place.
- **unit**—Sets the unit.

You can specify the following geo-spatial location information in geo-location configuration mode:

- **altitude**—Sets altitude information in units of floor, meters, or feet.
- **latitude**—Sets latitude information in degrees, minutes, and seconds. The range is from -90 degrees to 90 degrees. Positive numbers indicate locations north of the equator.

- **longitude**—Sets longitude information in degrees, minutes, and seconds. The range is from -180 degrees to 180 degrees. Positive numbers indicate locations east of the prime meridian.
- **resolution**—Sets the resolution for latitude and longitude. If the resolution value is not specified, default value of 10 meters is applied to latitude and longitude resolution parameters. For latitude and longitude, the resolution unit is measured in meters. The resolution value can also be a fraction.
- **default**—Sets the geographical location to its default attribute.
- **exit**—Exits from geographical location configuration mode.
- **no**—Negates the specified geographical parameters and sets the default value.

Use the **no lldp med-tlv-select location information** interface configuration command to disable the location TLV. The location TLV is enabled by default.

This example shows how to configure civic location information on the switch:

```
Device(config)# location civic-location identifier 1
Device(config-civic)# number 3550
Device(config-civic)# primary-road-name "Cisco Way"
Device(config-civic)# city "San Jose"
Device(config-civic)# state CA
Device(config-civic)# building 19
Device(config-civic)# room C6
Device(config-civic)# county "Santa Clara"
Device(config-civic)# country US
Device(config-civic)# end
```

You can verify your settings by entering the **show location civic-location** privileged EXEC command.

This example shows how to configure the emergency location information on the switch:

```
Device(config)# location elin-location 14085553881 identifier 1
```

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

The example shows how to configure geo-spatial location information on the switch:

```
Device(config)# location geo-location identifier host
Device(config-geo)# latitude 12.34
Device(config-geo)# longitude 37.23
Device(config-geo)# altitude 5 floor
Device(config-geo)# resolution 12.34
```

You can use the **show location geo-location identifier** command to display the configured geo-spatial location details.

# location plm calibrating

To configure path loss measurement (CCX S60) request for calibrating clients, use the **location plm calibrating** command in global configuration mode.

**location plm calibrating** {multiband | uniband}

| Syntax Description |   |
|--------------------|---|
| <b>multiband</b>   | Specifies the path loss measurement request for calibrating clients on the associated 802.11a or 802.11b/g radio. |
| <b>uniband</b>     | Specifies the path loss measurement request for calibrating clients on the associated 802.11a/b/g radio.          |

**Command Default** No default behavior or values.

**Command Modes** Global configuration

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** The uniband is useful for single radio clients (even if the radio is a dual band and can operate in the 2.4-GHz and the 5-GHz bands). The multiband is useful for multiple radio clients.

This example shows how to configure the path loss measurement request for calibrating clients on the associated 802.11a/b/g radio:

```
Device# configure terminal
Device(config)# location plm calibrating uniband
Device(config)# end
```

# mac address-table move update

To enable the MAC address table move update feature, use the **mac address-table move update** command in global configuration mode on the switch stack or on a standalone switch. To return to the default setting, use the **no** form of this command.

```
mac address-table move update {receive | transmit}
no mac address-table move update {receive | transmit}
```

## Syntax Description

|                 |  |
|-----------------|--|
| <b>receive</b>  | Specifies that the switch processes MAC address-table move update messages.  |
| <b>transmit</b> | Specifies that the switch sends MAC address-table move update messages to other switches in the network if the primary link goes down and the standby link comes up. |

## Command Default

By default, the MAC address-table move update feature is disabled.

## Command Modes

Global configuration

## Command History

### Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

The MAC address-table move update feature allows the switch to provide rapid bidirectional convergence if a primary (forwarding) link goes down and the standby link begins forwarding traffic.

You can configure the access switch to send the MAC address-table move update messages if the primary link goes down and the standby link comes up. You can configure the uplink switches to receive and process the MAC address-table move update messages.

## Examples

This example shows how to configure an access switch to send MAC address-table move update messages:

```
Device# configure terminal
Device(config)# mac address-table move update transmit
Device(config)# end
```

This example shows how to configure an uplink switch to get and process MAC address-table move update messages:

```
Device# configure terminal
Device(config)# mac address-table move update receive
Device(config)# end
```

You can verify your setting by entering the **show mac address-table move update** privileged EXEC command.

# mgmt\_init

To initialize the Ethernet management port, use the **mgmt\_init** command in boot loader mode.

## **mgmt\_init**

---

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

---

**Command Default** No default behavior or values.

---

**Command Modes** Boot loader

---

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

---

---

**Usage Guidelines** Use the **mgmt\_init** command only during debugging of the Ethernet management port.

---

**Examples** This example shows how to initialize the Ethernet management port:

Device: **mgmt\_init**

# mkdir

To create one or more directories on the specified file system, use the **mkdir** command in boot loader mode.

**mkdir** *filesystem:/directory-url...*

|                           |  |
|---------------------------|--|
| <b>Syntax Description</b> | <i>filesystem:</i> Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks.               |
|                           | <i>/directory-url...</i> Name of the directories to create. Separate each directory name with a space. |

|                        |                                |
|------------------------|--------------------------------|
| <b>Command Default</b> | No default behavior or values. |
|------------------------|--------------------------------|

|                      |             |
|----------------------|-------------|
| <b>Command Modes</b> | Boot loader |
|----------------------|-------------|

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

|                         |   |
|-------------------------|---|
| <b>Usage Guidelines</b> | <p>Directory names are case sensitive.</p> <p>Directory names are limited to 127 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.</p> |
|-------------------------|---|

## Example

This example shows how to make a directory called Saved\_Configs:

```
Device: mkdir usbflash0:Saved_Configs
Directory "usbflash0:Saved_Configs" created
```

## more

To display the contents of one or more files, use the **more** command in boot loader mode.

**more** *filesystem:/file-url...*

---

### Syntax Description

*filesystem*: Alias for a file system. Use **flash**: for the system board flash device.

*/file-url...* Path (directory) and name of the files to display. Separate each filename with a space.

---

### Command Default

No default behavior or values.

### Command Modes

Boot loader

### Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

---

### Usage Guidelines

Filenames and directory names are case sensitive.

If you specify a list of files, the contents of each file appears sequentially.

### Examples

This example shows how to display the contents of a file:

```
Device: more flash:image_file_name
version_suffix: universal-122-xx.SEx
version_directory: image_file_name
image_system_type_id: 0x00000002
image_name: image_file_name.bin
ios_image_file_size: 8919552
total_image_file_size: 11592192
image_feature: IP|LAYER_3|PLUS|MIN_DRAM_MEG=128
image_family: family
stacking_number: 1.34
board_ids: 0x00000068 0x00000069 0x0000006a 0x0000006b
info_end:
```

# no debug all

To disable debugging on a switch, use the **no debug all** command in Privileged EXEC mode.

## **no debug all**

---

**Command Default** No default behavior or values.

---

**Command Modes** Privileged EXEC

---

| <b>Command History</b> | <b>Release</b>            | <b>Modification</b>          |
|------------------------|---------------------------|------------------------------|
|                        | Cisco IOS XE Release 16.1 | This command was introduced. |

---

---

## **Examples**

This example shows how to disable debugging on a switch.

```
Device: no debug all
All possible debugging has been turned off.
```



# rename

To rename a file, use the **rename** command in boot loader mode.

```
rename filesystem:/source-file-url filesystem:/destination-file-url
```

## Syntax Description

|                              |   |
|------------------------------|---|
| <i>filesystem:</i>           | Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks. |
| <i>/source-file-url</i>      | Original path (directory) and filename.                               |
| <i>/destination-file-url</i> | New path (directory) and filename.                                    |

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

Filenames and directory names are case sensitive.

Directory names are limited to 127 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

Filenames are limited to 127 characters; the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

## Examples

This example shows a file named *config.text* being renamed to *config1.text*:

```
Device: rename usbflash0:config.text usbflash0:config1.text
```

You can verify that the file was renamed by entering the **dir filesystem:** boot loader command.

# request consent-token accept-response shell-access

To submit the Consent Token response to a previously generated challenge, use the **request consent-token accept-response shell-access** command.

**request consent-token accept-response shell-access** *response-string*

## Syntax Description

| Syntax                 | Description   |
|------------------------|---|
| <i>response-string</i> | Specifies the character string representing the response. |

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

| Command History | Release                        | Modification                 |
|-----------------|--------------------------------|------------------------------|
|                 | Cisco IOS XE Gibraltar 16.11.1 | This command was introduced. |

**Usage Guidelines** You must enter the response string within 30 minutes of challenge generation. If it is not entered, the challenge expires and a new challenge must be requested.

## Example

The following is sample output from the **request consent-token accept-response shell-access** *response-string* command:

```
Device# request consent-token accept-response shell-access
% Consent token authorization success
*Jan 18 02:51:37.807: %CTOKEN-6-AUTH_UPDATE: Consent Token Update (authentication success:
Shell access 0).
```

# request consent-token generate-challenge shell-access

To generate a Consent Token challenge for system shell access, use the **request consent-token generate-challenge shell-access** command.

**request consent-token generate-challenge shell-access auth-timeout *time-validity-slot***

## Syntax Description

| Syntax  | Description   |
|---|---|
| <b>auth-timeout</b> <i>time-validity-slot</i> | Specifies the time slot in minutes for which shell-access is requested. |

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

| Command History | Release                        | Modification                 |
|-----------------|--------------------------------|------------------------------|
|                 | Cisco IOS XE Gibraltar 16.11.1 | This command was introduced. |

**Usage Guidelines** When the requested time-slot for system shell expires, the session gets terminated automatically.  
The maximum authorization timeout for system shell access is seven days.

## Example

The following is sample output from the **request consent-token generate-challenge shell-access auth-timeout *time-validity-slot*** command:

```
Device# request consent-token generate-challenge shell-access auth-timeout 900
Device#
*Jan 18 02:47:06.733: %CTOKEN-6-AUTH_UPDATE: Consent Token Update (challenge generation attempt: Shell access 0).
```

# request consent-token terminate-auth

To terminate the Consent Token based authorization to system shell, use the **request consent-token terminate-auth** command.

## **request consent-token terminate-auth**

### Command Modes

Privileged EXEC mode (#)

### Command History

| Release                        | Modification                 |
|--------------------------------|------------------------------|
| Cisco IOS XE Gibraltar 16.11.1 | This command was introduced. |

### Usage Guidelines

In system shell access scenario, exiting the shell does not terminate authorization until the authorization timeout occurs.

We recommend that you force terminate system shell authorization by explicitly issuing the **request consent-token terminate-auth** command once the purpose of system shell access is complete.

If the current authentication is terminated using the **request consent-token terminate-auth** command, the user will have to repeat the authentication process to gain access to system shell.

### Example

The following is sample output from the **request consent-token terminate-auth** command:

```
Device# request consent-token terminate-auth shell-access
% Consent token authorization termination success

Device#
*Mar 13 01:45:39.197: %CTOKEN-6-AUTH_UPDATE: Consent Token Update (terminate authentication:
Shell access 0).
Device#
```

# request platform software console attach switch

To start a session on a member switch, use the **request platform software console attach switch** command in privileged EXEC mode.



**Note** On stacking switches (Catalyst 3650/3850/9200/9300 switches), this command can only be used to start a session on the standby console. On Catalyst 9500 switches, this command is supported only in a stackwise virtual setup. You cannot start a session on member switches. By default, all consoles are already active, so a request to start a session on the active console will result in an error.

**request platform software console attach switch** { *switch-number* | **active** | **standby** } { **0/0** | **R0** }

| Syntax Description   |  |
|----------------------|--|
| <i>switch-number</i> | Specifies the switch number. The range is from 1 to 9.                     |
| <b>active</b>        | Specifies the active switch.   |
| <b>Note</b>          | This argument is not supported on Catalyst 9500 switches.                  |
| <b>standby</b>       | Specifies the standby switch.  |
| <b>0/0</b>           | Specifies that the SPA-Inter-Processor slot is 0, and bay is 0.            |
| <b>Note</b>          | Do not use this option with stacking switches. It will result in an error. |
| <b>R0</b>            | Specifies that the Route-Processor slot is 0.                              |

**Command Default** By default, all switches in the stack are active.

**Command Modes** Privileged EXEC (#)

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** To start a session on the standby switch, you must first enable it in the configuration.

**Examples** This example shows how to session to the standby switch:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# redundancy
Device(config-red)# main-cpu
Device(config-r-mc)# standby console enable
Device(config-r-mc)# end
```

**request platform software console attach switch**

```
Device# request platform software console attach switch standby R0
#
# Connecting to the IOS console on the route-processor in slot 0.
# Enter Control-C to exit.
#
Device-stby> enable
Device-stby#
```

# reset

To perform a hard reset on the system, use the **reset** command in boot loader mode. A hard reset is similar to power-cycling the device; it clears the processor, registers, and memory.

**reset**

---

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

---

**Command Default** No default behavior or values.

---

**Command Modes** Boot loader

---

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

---

---

## Examples

This example shows how to reset the system:

```
Device: reset  
Are you sure you want to reset the system (y/n)? y  
System resetting...
```

# rmdir

To remove one or more empty directories from the specified file system, use the **rmdir** command in boot loader mode.

**rmdir** *filesystem:/directory-url...*

## Syntax Description

*filesystem:* Alias for a file system. Use **usbflash0:** for USB memory sticks.

*/directory-url...* Path (directory) and name of the empty directories to remove. Separate each directory name with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

Directory names are case sensitive and limited to 45 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

Before removing a directory, you must first delete all of the files in the directory.

The device prompts you for confirmation before deleting each directory.

## Example

This example shows how to remove a directory:

```
Device: rmdir usbflash0:Test
```

You can verify that the directory was deleted by entering the **dir filesystem:** boot loader command.



# sdm prefer

To specify the SDM template for use on the switch, use the **sdm prefer** command in global configuration mode.

```
sdm prefer
{ advanced }
```

|                           |   |
|---------------------------|---|
| <b>Syntax Description</b> | <b>advanced</b> Supports advanced features such as NetFlow. |
|---------------------------|---|

|                        |                                |
|------------------------|--------------------------------|
| <b>Command Default</b> | No default behavior or values. |
|------------------------|--------------------------------|

|                      |                      |
|----------------------|----------------------|
| <b>Command Modes</b> | Global configuration |
|----------------------|----------------------|

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

|                         |  |
|-------------------------|--|
| <b>Usage Guidelines</b> | <p>In a device stack, all stack members must use the same SDM template that is stored on the active device.</p> <p>When a new device is added to a stack, the SDM configuration that is stored on the active device overrides the template configured on an individual device.</p> |
|-------------------------|--|

## Example

This example shows how to configure the advanced template:

```
Device(config)# sdm prefer advanced
Device(config)# exit
Device# reload
```

# service private-config-encryption

To enable private configuration file encryption, use the **service private-config-encryption** command. To disable this feature, use the **no** form of this command.

**service private-config-encryption**  
**no service private-config-encryption**

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

**Command Default** No default behavior or values.

**Command Modes** Global configuration (config)

| Command History | Release                   | Modification                 |
|-----------------|---------------------------|------------------------------|
|                 | Cisco IOS XE Fuji 16.8.1a | This command was introduced. |

## Examples

The following example shows how to enable private configuration file encryption:

```
Device> enable
Device# configure terminal
Device(config)# service private-config-encryption
```

## Related Commands

| Command                                | Description   |
|--|---|
| <b>show parser encrypt file status</b> | Displays the private configuration encryption status. |

# set

To set or display environment variables, use the **set** command in boot loader mode. Environment variables can be used to control the boot loader or any other software running on the device.

**set** *variable value*

## Syntax Description

|                 |  |
|-----------------|--|
| <i>variable</i> | Use one of the following keywords for <i>variable</i> and the appropriate value for <i>value</i> :   |
| <i>value</i>    | <p><b>MANUAL_BOOT</b>—Decides whether the device boots automatically or manually.</p> <p>Valid values are 1/Yes and 0/No. If it is set to 0 or No, the boot loader attempts to automatically boot the system. If it is set to anything else, you must manually boot the device from the boot loader mode.</p> <hr/> <p><b>BOOT</b> <i>filesystem:/file-url</i>—Identifies a semicolon-separated list of executable files to try to load and execute when automatically booting.</p> <p>If the BOOT environment variable is not set, the system attempts to load and execute the first executable image it can find by using a recursive, depth-first search through the flash: file system. If the BOOT variable is set but the specified images cannot be loaded, the system attempts to boot the first bootable file that it can find in the flash: file system.</p> <hr/> <p><b>ENABLE_BREAK</b>—Allows the automatic boot process to be interrupted when the user presses the <b>Break</b> key on the console.</p> <p>Valid values are 1, Yes, On, 0, No, and Off. If set to 1, Yes, or On, you can interrupt the automatic boot process by pressing the <b>Break</b> key on the console after the flash: file system has initialized.</p> <hr/> <p><b>HELPER</b> <i>filesystem:/file-url</i>—Identifies a semicolon-separated list of loadable files to dynamically load during the boot loader initialization. Helper files extend or patch the functionality of the boot loader.</p> <hr/> <p><b>PS1</b> <i>prompt</i>—Specifies a string that is used as the command-line prompt in boot loader mode.</p> <hr/> <p><b>CONFIG_FILE flash:</b> <i>/file-url</i>—Specifies the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration.</p> <hr/> <p><b>BAUD</b> <i>rate</i>—Specifies the number of bits per second (b/s) that is used for the baud rate for the console. The Cisco IOS software inherits the baud rate setting from the boot loader and continues to use this value unless the configuration file specifies another setting. The range is from 0 to 128000 b/s. Valid values are 50, 75, 110, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 56000, 57600, 115200, and 128000.</p> <p>The most commonly used values are 300, 1200, 2400, 9600, 19200, 57600, and 115200.</p> <hr/> <p><b>SWITCH_NUMBER</b> <i>stack-member-number</i>—Changes the member number of a stack member.</p> <hr/> <p><b>SWITCH_PRIORITY</b> <i>priority-number</i>—Changes the priority value of a stack member.</p> |

## Command Default

The environment variables have these default values:

MANUAL\_BOOT: No (0)

BOOT: Null string

ENABLE\_BREAK: No (Off or 0) (the automatic boot process cannot be interrupted by pressing the **Break** key on the console).

HELPER: No default value (helper files are not automatically loaded).

PS1 device:

CONFIG\_FILE: config.text

BAUD: 9600 b/s

SWITCH\_NUMBER: 1

SWITCH\_PRIORITY: 1



**Note** Environment variables that have values are stored in the flash: file system in various files. Each line in the files contains an environment variable name and an equal sign followed by the value of the variable.

A variable has no value if it is not listed in these files; it has a value if it is listed even if the value is a null string. A variable that is set to a null string (for example, “”) is a variable with a value.

Many environment variables are predefined and have default values.

#### Command Modes

Boot loader

#### Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

#### Usage Guidelines

Environment variables are case sensitive and must be entered as documented.

Environment variables that have values are stored in flash memory outside of the flash: file system.

Under typical circumstances, it is not necessary to alter the setting of the environment variables.

The MANUAL\_BOOT environment variable can also be set by using the **boot manual** global configuration command.

The BOOT environment variable can also be set by using the **boot system filesystem:/file-url** global configuration command.

The ENABLE\_BREAK environment variable can also be set by using the **boot enable-break** global configuration command.

The HELPER environment variable can also be set by using the **boot helper filesystem: /file-url** global configuration command.

The CONFIG\_FILE environment variable can also be set by using the **boot config-file flash: /file-url** global configuration command.

The SWITCH\_NUMBER environment variable can also be set by using the **switch current-stack-member-number renumber new-stack-member-number** global configuration command.

The SWITCH\_PRIORITY environment variable can also be set by using the device *stack-member-number* **priority** *priority-number* global configuration command.

The boot loader prompt string (PS1) can be up to 120 printable characters not including the equal sign (=).

### Example

This example shows how to set the SWITCH\_PRIORITY environment variable:

```
Device: set SWITCH_PRIORITY 2
```

You can verify your setting by using the **set** boot loader command.

# show avc client

To display information about top number of applications, use the **show avc client** command in privileged EXEC mode.

**show avc client** *client-mac* **top n application** [**aggregate** | **upstream** | **downstream**]

|                           |   |
|---------------------------|---|
| <b>Syntax Description</b> | <b>client</b> <i>client-mac</i> Specifies the client MAC address.                           |
|                           | <b>top n application</b> Specifies the number of top "N" applications for the given client. |
| <b>Command Default</b>    | No default behavior or values.  |
| <b>Command Modes</b>      | Privileged EXEC   |
| <b>Command History</b>    | <b>Release</b> <b>Modification</b>  |
|                           | This command was introduced.  |

The following is sample output from the **show avc client** command:

```
Device# sh avc client 0040.96ae.65ec top 10 application aggregate
```

Cumulative Stats:

| No. | AppName | Packet-Count | Byte-Count | AvgPkt-Size | usage% |
|-----|---------|--------------|------------|-------------|--------|
| 1   | skinny  | 7343         | 449860     | 61          | 94     |
| 2   | unknown | 99           | 13631      | 137         | 3      |
| 3   | dhcp    | 18           | 8752       | 486         | 2      |
| 4   | http    | 18           | 3264       | 181         | 1      |
| 5   | tftp    | 9            | 534        | 59          | 0      |
| 6   | dns     | 2            | 224        | 112         | 0      |

Last Interval(90 seconds) Stats:

| No. | AppName | Packet-Count | Byte-Count | AvgPkt-Size | usage% |
|-----|---------|--------------|------------|-------------|--------|
| 1   | skinny  | 9            | 540        | 60          | 100    |

# show bootflash:

To display information about the bootflash: file system, use the **show bootflash:** command in user EXEC or privileged EXEC mode.

**show bootflash:** [{**all** | **fileys** | **namesort** | **sizesort** | **timesort** }]

| Syntax Description |                 |   |
|--------------------|-----------------|---|
|                    | <b>all</b>      | (Optional) Displays all possible Flash information. |
|                    | <b>fileys</b>   | (Optional) Displays Flash system information.       |
|                    | <b>namesort</b> | (Optional) Sorts the output by file name.           |
|                    | <b>sizesort</b> | (Optional) Sorts the output by file size.           |
|                    | <b>timesort</b> | (Optional) Sorts the output by time stamp.          |

| Command Default |                     |
|-----------------|---------------------|
|                 | User EXEC (>)       |
|                 | Privileged EXEC (#) |

| Command History | Release                       | Modification  |
|-----------------|-------------------------------|---|
|                 | Cisco IOS XE Everest 16.5.1a  | This command was introduced.  |
|                 | Cisco IOS XE Amsterdam 17.3.1 | The following keywords were introduced: <ul style="list-style-type: none"> <li>• <b>namesort</b></li> <li>• <b>sizesort</b></li> <li>• <b>timesort</b></li> </ul> |

## Example:

The following is a sample output from the **show bootflash: all** command:

```
Device# show bootflash: all
-#- --length-- -----date/time----- path
2      4096 May 11 2020 16:49:01.0000000000 +00:00 .installer
3      4096 Feb 27 2020 15:03:50.0000000000 +00:00 .installer/issu_crash
4          12 May 05 2020 22:06:48.0000000000 +00:00 .installer/issu_crash/fru_crash
5          50 May 11 2020 16:40:40.0000000000 +00:00 .installer/last_pkgconf_shasum
6           6 Feb 27 2020 16:33:59.0000000000 +00:00 .installer/install_issu_pid
7          13 Feb 27 2020 21:05:35.0000000000 +00:00 .installer/install_issu_prev_state
8          17 Feb 27 2020 21:05:36.0000000000 +00:00 .installer/install_issu_state
9          13 May 11 2020 16:41:12.0000000000 +00:00 .installer/watchlist
```

show bootflash:

```

10      8 Feb 28 2020 18:04:31.0000000000 +00:00 .installer/crdu_frus
11      0 Mar 01 2020 18:01:09.0000000000 +00:00 .installer/.install_add_pkg_list.prev.txt
12     1729 Mar 01 2020 18:02:54.0000000000 +00:00 .installer/install_add_oper.log
13      5 May 11 2020 16:40:40.0000000000 +00:00 .installer/install_global_trans_lock
14     10 May 11 2020 16:40:40.0000000000 +00:00 .installer/install_state
15    33554432 May 11 2020 16:42:37.0000000000 +00:00 nvram_config
16     396 May 11 2020 16:41:02.0000000000 +00:00 boothelper.log
17    4096 May 11 2020 16:40:42.0000000000 +00:00 rpr
18     80 May 11 2020 16:40:42.0000000000 +00:00 rpr/RPR_log.txt
19     80 May 05 2020 22:10:45.0000000000 +00:00 rpr/RPR_log_prev.txt
20    2183 May 11 2020 16:40:42.0000000000 +00:00 bootloader_evt_handle.log
21    4096 Mar 06 2020 21:00:51.0000000000 +00:00 .ssh
22     965 Dec 24 2019 15:23:55.0000000000 +00:00 .ssh/ssh_host_key
23     630 Dec 24 2019 15:23:55.0000000000 +00:00 .ssh/ssh_host_key.pub
24    1675 Dec 24 2019 15:23:56.0000000000 +00:00 .ssh/ssh_host_rsa_key
25     382 Dec 24 2019 15:23:56.0000000000 +00:00 .ssh/ssh_host_rsa_key.pub
26     668 Dec 24 2019 15:23:56.0000000000 +00:00 .ssh/ssh_host_dsa_key
27     590 Dec 24 2019 15:23:56.0000000000 +00:00 .ssh/ssh_host_dsa_key.pub
28     492 Mar 06 2020 21:00:51.0000000000 +00:00 .ssh/ssh_host_ecdsa_key
29     162 Mar 06 2020 21:00:51.0000000000 +00:00 .ssh/ssh_host_ecdsa_key.pub
30     387 Mar 06 2020 21:00:51.0000000000 +00:00 .ssh/ssh_host_ed25519_key
31     82 Mar 06 2020 21:00:51.0000000000 +00:00 .ssh/ssh_host_ed25519_key.pub
32    4096 Dec 24 2019 15:24:41.0000000000 +00:00 core
33    4096 May 11 2020 16:41:29.0000000000 +00:00 core/modules
34    4096 May 05 2020 22:11:47.0000000000 +00:00 .prst_sync
35    4096 Mar 01 2020 18:17:15.0000000000 +00:00 .rollback_timer
36    4096 Mar 06 2020 21:01:11.0000000000 +00:00 gs_script
37    4096 Mar 06 2020 21:01:11.0000000000 +00:00 gs_script/sss
38    4096 Apr 24 2020 18:56:40.0000000000 +00:00 tech_support
39   15305 May 11 2020 16:41:01.0000000000 +00:00 tech_support/igmp-snooping.tcl
40    1612 May 11 2020 16:41:01.0000000000 +00:00 tech_support/igmpsn_dump.tcl
.

```



.

.

The following is a sample output from the **show bootflash: sizesort** command:

```
Device# show bootflash: sizesort
-#- --length-- -----date/time----- path
126 968337890 Mar 27 2020 18:06:17.0000000000 +00:00 cat9k_iosxe.CSCvt37598.bin
136 967769293 May 05 2020 21:50:33.0000000000 +00:00 cat9k_iosxe.CSCvu05574
124 967321806 Mar 23 2020 18:48:45.0000000000 +00:00 cat9k_ts_2103.bin
133 951680494 Apr 13 2020 19:46:35.0000000000 +00:00
cat9k_iosxe.2020-04-13_17.34_rakoppak.SSA.bin
130 950434163 Apr 09 2020 09:03:47.0000000000 +00:00
cat9k_iosxe.2020-04-09_13.49_rakoppak.SSA.bin
132 950410332 Apr 09 2020 07:29:57.0000000000 +00:00
cat9k_iosxe.2020-04-09_12.28_rakoppak.SSA.bin
134 948402972 Apr 17 2020 23:02:04.0000000000 +00:00 cat9k_iosxe.tla.bin
77 810146146 Feb 27 2020 15:41:42.0000000000 +00:00 cat9k_iosxe.16.12.01c.SPA.bin
88 701945494 Feb 27 2020 16:23:55.0000000000 +00:00 cat9k_iosxe.16.09.03.SPA.bin
101 535442436 Mar 01 2020 18:01:41.0000000000 +00:00 cat9k-rpbase.16.12.01c.SPA.pkg
86 88884228 Mar 01 2020 18:01:41.0000000000 +00:00 cat9k-esppbase.16.12.01c.SPA.pkg
104 60167172 Mar 01 2020 18:01:41.0000000000 +00:00 cat9k-sipspa.16.12.01c.SPA.pkg
102 43111770 Mar 01 2020 18:02:07.0000000000 +00:00 cat9k-rpboot.16.12.01c.SPA.pkg
15 33554432 May 11 2020 16:42:37.0000000000 +00:00 nvram_config
131 33554432 May 11 2020 16:42:39.0000000000 +00:00 nvram_config_bkup
103 31413252 Mar 01 2020 18:01:41.0000000000 +00:00 cat9k-sipbase.16.12.01c.SPA.pkg
105 22676484 Mar 01 2020 18:01:41.0000000000 +00:00 cat9k-srdriver.16.12.01c.SPA.pkg
85 14226440 Mar 01 2020 18:01:41.0000000000 +00:00 cat9k-cc_srdriver.16.12.01c.SPA.pkg
.
```

# show debug

To display all the debug commands available on a switch, use the **show debug** command in Privileged EXEC mode.

**show debug**

**show debug condition** *Condition identifier* | *All conditions*

| Syntax Description |   |
|--------------------|---|
|                    | <i>Condition identifier</i> Sets the value of the condition identifier to be used. Range is between 1 and 1000. |
|                    | <i>All conditions</i> Shows all conditional debugging options available.  |

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

| Command History | Release                   | Modification                 |
|-----------------|---------------------------|------------------------------|
|                 | Cisco IOS XE Release 16.1 | This command was introduced. |

**Usage Guidelines** Because debugging output is assigned high priority in the CPU process, it can render the system unusable. For this reason, use debug commands only to troubleshoot specific problems or during troubleshooting sessions with Cisco technical support staff. Moreover, it is best to use debug commands during periods of lower network traffic and fewer users. Debugging during these periods decreases the likelihood that increased debug command processing overhead will affect system use.

**Examples** This example shows the output of a **show debug** command:

```
Device# show debug condition all
```

To disable debugging, use the **no debug all** command.

# show env

To display fan, temperature, and power information for the switch (standalone switch, stack's active switch, or stack member), use the **show env** command in EXEC modes.

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

| Syntax Description                 |  |  |
|------------------------------------|--|--|
| <b>all</b>                         |  | Displays fan, temperature and power environmental status.  |
| <b>fan</b>                         |  | Displays the switch fan status.  |
| <b>power</b>                       |  | Displays the power supply status.  |
| <b>all</b>                         |  | (Optional) Displays the status for all power supplies.   |
| <b>switch</b> <i>switch-number</i> |  | (Optional) Displays the power supply status for a specific switch.   |
| <b>stack</b> <i>switch-number</i>  |  | (Optional) Displays all environmental status for each switch in the stack or for a specified switch. The range is 1 to 9, depending on the switch member numbers in the stack. |
| <b>temperature</b>                 |  | Displays the switch temperature status.  |
| <b>status</b>                      |  | (Optional) Displays the temperature status and threshold values.   |

**Command Default** No default behavior or values.

**Command Modes** User EXEC  
Privileged EXEC

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** Use the **show env stack** [*switch-number*] command to display information about any switch in the stack from any member switch.

Use the **show env temperature status** command to display the switch temperature states and threshold levels.

## Examples

This example shows how to display information about stack member 1 from the active switch:

```
Device> show env stack 1
Device 1:
Device Fan 1 is OK
Device Fan 2 is OK
Device Fan 3 is OK
FAN-PS1 is OK
```

```
FAN-PS2 is NOT PRESENT
Device 1: SYSTEM TEMPERATURE is OK
Temperature Value: 32 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 41 Degree Celsius
Red Threshold : 56 Degree Celsius
```

```
Device>
```

This example shows how to display temperature value, state, and threshold values:

```
Device> show env temperature status
Temperature Value: 32 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 41 Degree Celsius
Red Threshold : 56 Degree Celsius
```

```
Device>
```

**Table 2: States in the show env temperature status Command Output**

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

# show env xps

To display budgeting, configuration, power, and system power information for the Cisco eXpandable Power System (XPS) 2200, use the **show env xps** command in privileged EXEC mode.

```
show env xps { budgeting | configuration | port [ all | number ] | power | system |
thermal | upgrade | version }
```

| Syntax Description          |  |   |
|-----------------------------|--|---|
| <b>budgeting</b>            |  | Displays XPS power budgeting, the allocated and budgeted power of all switches in the power stack.  |
| <b>configuration</b>        |  | Displays the configuration resulting from the power xps privileged EXEC commands. The XPS configuration is stored in the XPS. Enter the show env xps configuration command to retrieve the non-default configuration. |
| <b>port</b> [all   number ] |  | Displays the configuration and status of all ports or the specified XPS port. Port numbers are from 1 to 9.   |
| <b>power</b>                |  | Displays the status of the XPS power supplies.  |
| <b>system</b>               |  | Displays the XPS system status.   |
| <b>thermal</b>              |  | Displays the XPS thermal status.  |
| <b>upgrade</b>              |  | Displays the XPS upgrade status.  |
| <b>version</b>              |  | Displays the XPS version details.   |

**Command Modes** Privileged EXEC

| Command History | Release     | Modification                 |
|-----------------|-------------|------------------------------|
|                 | 12.2(55)SE1 | This command was introduced. |

**Usage Guidelines** Use the **show env xps** privileged EXEC command to display the information for XPS 2200.

## Examples

This is an example of output from the show env xps budgeting command:

```
Switch#
=====

XPS 0101.0100.0000 :
=====
Data          Current   Power    Power Port  Switch #  PS A  PS B  Role-State
Committed
Budget
-----
223          1543
----- 1 - - 715 SP-PS
```

```

2      -      -      -      SP-PS      223      223
3      -      -      -      -          -          -
4      -      -      -      -          -          -
5      -      -      -      -          -          -
6      -      -      -      -          -          -
7      -      -      -      -          -          -
8      -      -      -      -          -          -
9      1      1100 -      RPS-NB      223      070
XPS   -      -      1100 -      -          -          -

```

This is an example of output from the show env xps configuration command:

```

Switch# show env xps configuration
=====
XPS 0101.0100.0000 :
=====
power xps port 4 priority 5
power xps port 5 mode disable
power xps port 5 priority 6
power xps port 6 priority 7
power xps port 7 priority 8
power xps port 8 priority 9
power xps port 9 priority 4

```

This is an example of output from the show env xps port all command:

```

Switch#
XPS 010

-----
Port name          : -
Connected          : Yes
Mode               : Enabled (On)
Priority           : 1
Data stack switch # : - Configured role      : Auto-SP
Run mode           : SP-PS : Stack Power Power-Sharing Mode
Cable faults       : 0x0 XPS 0101.0100.0000 Port 2
-----
Port name          : -
Connected          : Yes
Mode               : Enabled (On)
Priority           : 2
Data stack switch # : - Configured role      : Auto-SP
Run mode           : SP-PS : Stack Power Power-Sharing Mode
Cable faults       : 0x0 XPS 0101.0100.0000 Port 3
-----
Port name          : -
Connected          : No
Mode               : Enabled (On)
Priority           : 3
Data stack switch # : - Configured role      : Auto-SP Run mode           : -
Cable faults       :
<output truncated>

```

This is an example of output from the show env xps power command:

```

=====
XPS 0101.0100.0000 :
=====
Port-Supply SW PID          Serial#      Status      Mode Watts
-----
XPS-A          Not present
XPS-B          NG3K-PWR-1100WAC  LIT13320NTV OK          SP   1100
1-A            -      -          -          -

```

```

1-B      - -      -      -      SP      715
2-A      - -      -      -
2-B      - -      -      -
9-A      - -      100WAC  LIT141307RK OK      RPS  1100
9-B      - -      esent

```

This is an example of output from the show env xps system command:

```

Switch#
=====

XPS 0101.0100.0000 :
=====
XPS              Cfg  Cfg      RPS Switch  Current  Data Port  XPS Port Name
-----
Mode Role      Pri Conn  Role-State  Switch #
-----
1      -              On  Auto-SP  1  Yes      SP-PS      -
2      -              On  Auto-SP  2  Yes      SP-PS      -
3      -              On  Auto-SP  3  No       -          -
4      none           On  Auto-SP  5  No       -          -
5      -              Off  Auto-SP  6  No       -          -
6      -              On  Auto-SP  7  No       -          -
7      -              On  Auto-SP  8  No       -          -
8      -              On  Auto-SP  9  No       -          -
9      test           On  Auto-SP  4  Yes      RPS-NB

```

This is an example of output from the show env xps thermal command:

```

Switch#
=====

XPS 0101.0100.0000 :
=====
Fan  Status
----
1      OK
2      OK
3      NOT PRESENT PS-1  NOT PRESENT PS-2  OK Temperature is OK

```

This is an example of output from the show env xps upgrade command when no upgrade is occurring:

```

Switch# show env xps upgrade
No XPS is connected and upgrading.

```

These are examples of output from the show env xps upgrade command when an upgrade is in process:

```

Switch# show env xps upgrade
XPS Upgrade Xfer

SW Status Prog
--
1 Waiting 0%
Switch#
*Mar 22 03:12:46.723: %PLATFORM_XPS-6-UPGRADE_START: XPS 0022.bdd7.9b14 upgrade has
started through the Service Port.
Switch# show env xps upgrade
XPS Upgrade Xfer
SW Status Prog
--
1 Receiving 1%
Switch# show env xps upgrade

```

```

XPS Upgrade Xfer
SW Status Prog
-- -----
1 Receiving 5%
Switch# show env xps upgrade
XPS Upgrade Xfer
SW Status Prog
-- -----
1 Reloading 100%
Switch#
*Mar 22 03:16:01.733: %PLATFORM_XPS-6-UPGRADE_DONE: XPS 0022.bdd7.9b14 upgrade has
completed and the XPS is reloading.

```

This is an example of output from the show env xps version command:

```

Switch# show env xps version
=====
XPS 0022.bdd7.9b14:
=====
Serial Number: FDO13490KUT
Hardware Version: 8
Bootloader Version: 7
Software Version: 18

```

**Table 3: Related Commands**

| Command                                 | Description                          |
|---|--------------------------------------|
| power xps(global configuration command) | Configures XPS and XPS port names.   |
| power xps(privileged EXEC command)      | Configures the XPS ports and system. |



# show flow monitor

To display the status and statistics for a flow monitor, use the **show flow monitor** command in privileged EXEC mode.

| Syntax Description | name                | (Optional) Specifies the name of a flow monitor.   |
|--------------------|---------------------|--|
|                    | <i>monitor-name</i> | (Optional) Name of a flow monitor that was previously configured.                              |
|                    | <b>cache</b>        | (Optional) Displays the contents of the cache for the flow monitor.                            |
|                    | <b>format</b>       | (Optional) Specifies the use of one of the format options for formatting the display output.   |
|                    | <b>csv</b>          | (Optional) Displays the flow monitor cache contents in comma-separated variables (CSV) format. |
|                    | <b>record</b>       | (Optional) Displays the flow monitor cache contents in record format.                          |
|                    | <b>table</b>        | (Optional) Displays the flow monitor cache contents in table format.                           |
|                    | <b>statistics</b>   | (Optional) Displays the statistics for the flow monitor.                                       |

**Command Modes** Privileged EXEC

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** The **cache** keyword uses the record format by default.

The uppercase field names in the display output of the **show flowmonitor monitor-name cache** command are key fields that uses to differentiate flows. The lowercase field names in the display output of the **show flow monitor monitor-name cache** command are nonkey fields from which collects values as additional data for the cache.

## Examples

The following example displays the status for a flow monitor:

```
Device# show flow monitor FLOW-MONITOR-1

Flow Monitor FLOW-MONITOR-1:
  Description:      Used for basic traffic analysis
  Flow Record:     flow-record-1
  Flow Exporter:   flow-exporter-1
                  flow-exporter-2

Cache:
  Type:            normal
  Status:          allocated
  Size:            4096 entries / 311316 bytes
  Inactive Timeout: 15 secs
  Active Timeout:  1800 secs
```

This table describes the significant fields shown in the display.

Table 4: show flow monitor monitor-name Field Descriptions

| Field            | Description   |
|------------------|---|
| Flow Monitor     | Name of the flow monitor that you configured.   |
| Description      | Description that you configured or the monitor, or the default description User defined.  |
| Flow Record      | Flow record assigned to the flow monitor.   |
| Flow Exporter    | Exporters that are assigned to the flow monitor.  |
| Cache            | Information about the cache for the flow monitor.   |
| Type             | Flow monitor cache type. The value is always normal, as it is the only supported cache type.  |
| Status           | Status of the flow monitor cache.<br>The possible values are: <ul style="list-style-type: none"> <li>• allocated—The cache is allocated.</li> <li>• being deleted—The cache is being deleted.</li> <li>• not allocated—The cache is not allocated.</li> </ul> |
| Size             | Current cache size.   |
| Inactive Timeout | Current value for the inactive timeout in seconds.  |
| Active Timeout   | Current value for the active timeout in seconds.  |

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-1:

This table describes the significant fields shown in the display.

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-1 in a table format:

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-IPv6 (the cache contains IPv6 data) in record format:

The following example displays the status and statistics for a flow monitor:

# show install

To display information about install packages, use the **show install** command in privileged EXEC mode.

**show install** {**active** | **committed** | **inactive** | **log** | **package** {**bootflash:** | **flash:** | **webui:**} | **rollback** | **summary** | **uncommitted**}

| Syntax Description                                |  |  |
|---|--|--|
| <b>active</b>                                     |  | Displays information about active packages.  |
| <b>committed</b>                                  |  | Displays package activations that are persistent.  |
| <b>inactive</b>                                   |  | Displays inactive packages.  |
| <b>log</b>  |  | Displays entries stored in the logging installation buffer.  |
| <b>package</b>                                    |  | Displays metadata information about the package, including description, restart information, components in the package, and so on. |
| <b>{bootflash:   flash:   harddisk:   webui:}</b> |  | Specifies the location of the install package.   |
| <b>rollback</b>                                   |  | Displays the software set associated with a saved installation.  |
| <b>summary</b>                                    |  | Displays information about the list of active, inactive, committed, and superseded packages.                                       |
| <b>uncommitted</b>                                |  | Displays package activations that are nonpersistent.   |

**Command Modes** Privileged EXEC (#)

| Command History | Release                     | Modification                 |
|-----------------|-----------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.6.1 | This command was introduced. |

**Usage Guidelines** Use the show commands to view the status of the install package.

## Example

The following is sample output from the **show install package** command:

```
Device# show install package bootflash:cat3k-universalk9.2017-01-10_13.15.1.
CSCxxx.SSA.dmp.bin
Name: cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SS
Version: 16.6.1.0.199.1484082952..Everest
Platform: Catalyst3k
Package Type: dmp
Defect ID: CSCxxx
Package State: Added
Supersedes List: {}
Smu ID: 1
```

The following is sample output from the **show install summary** command:

```
Device# show install summary

Active Packages:
  bootflash:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
Inactive Packages:
  No packages
Committed Packages:
  bootflash:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
Uncommitted Packages:
  No packages
Device#
```

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

**Table 5: show install summary Field Descriptions**

| Field                | Description  |
|----------------------|--|
| Active Packages      | Name of the active install package.  |
| Inactive Packages    | List of inactive packages.   |
| Committed Packages   | Install packages that have saved or committed changes to the harddisk, so that the changes become persistent across reloads. |
| Uncommitted Packages | Intall package activations that are nonpersistent.   |

The following is sample output from the **show install log** command:

```
Device# show install log

[0|install_op_boot]: START Fri Feb 24 19:20:19 Universal 2017
[0|install_op_boot]: END SUCCESS Fri Feb 24 19:20:23 Universal 2017
[3|install_add]: START Sun Feb 26 05:55:31 UTC 2017
[3|install_add( FATAL)]: File path (scp) is not yet supported for this command
[4|install_add]: START Sun Feb 26 05:57:04 UTC 2017
[4|install_add]: END SUCCESS
/bootflash/cat3k-universalk9.2017-01-10_13.15.1.CSCvb12345.SSA.dmp.bin
Sun Feb 26 05:57:22 UTC 2017
[5|install_activate]: START Sun Feb 26 05:58:41 UTC 2017
```

#### Related Commands

| Command        | Description            |
|----------------|------------------------|
| <b>install</b> | Installs SMU packages. |

# show location

To display location information for an endpoint, use the **show location** command in privileged EXEC mode.

## show location

```
[{admin-tag | civic-location{identifier identifier-string | interface type number | static} |
custom-location{identifier identifier-string | interface type number | static} | elin-location{identifier
identifier-string | interface type number | static} | geo-location{identifier identifier-string | interface
type number | static} | host}]
```

| Syntax Description                            |  |   |
|---|--|---|
| <b>admin-tag</b>                              |  | Displays administrative tag or site information.  |
| <b>civic-location</b>                         |  | Specifies civic location information.   |
| <b>identifier</b><br><i>identifier-string</i> |  | Information identifier of the civic location, custom location, or geo-spatial location.   |
| <b>interface</b> <i>type number</i>           |  | Interface type and number.<br><br>For information about the numbering syntax for your device, use the question mark (?) online help function. |
| <b>static</b>                                 |  | Displays configured civic, custom, or geo-spatial location information.   |
| <b>custom-location</b>                        |  | Specifies custom location information.  |
| <b>elin-location</b>                          |  | Specifies emergency location information (ELIN).  |
| <b>geo-location</b>                           |  | Specifies geo-spatial location information.   |
| <b>host</b>                                   |  | Specifies the civic, custom, or geo-spatial host location information.  |

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

The following sample output of the **show location civic-location** command displays civic location information for the specified identifier (*identifier 1*):

```
Device# show location civic-location identifier 1
Civic location information
-----
Identifier           : 1
County              : Santa Clara
Street number       : 3550
Building            : 19
Room                : C6
Primary road name   : Example
```

**show location**

```
City           : San Jose
State          : CA
Country        : US
```

**Related Commands**

| <b>Command</b>  | <b>Description</b>                               |
|-----------------|--|
| <b>location</b> | Configures location information for an endpoint. |

# show logging onboard switch uptime

To display a history of all reset reasons for all modules or switches in a system, use the **show logging onboard switch uptime** command.

**show logging onboard switch** { *switch-number* | **active** | **standby** } **uptime** [ [ **continuous** | **detail** ] [ **start** *hour day month* [*year*] [ **end** *hour day month year* ] ] ] | **summary** ]

| Syntax Description                      |  |  |
|---|--|--|
| <b>switch</b> <i>switch-number</i>      |  | Specifies a switch. Enter the switch number.         |
| <b>active</b>                           |  | Specifies the active instance.                       |
| <b>standby</b>                          |  | Specifies the standby instance.                      |
| <b>continuous</b>                       |  | (Optional) Displays continuous data.                 |
| <b>detail</b>                           |  | (Optional) Displays detailed data.                   |
| <b>start</b> <i>hour day month year</i> |  | (Optional) Specifies the start time to display data. |
| <b>end</b> <i>hour day month year</i>   |  | (Optional) Specifies the end time to display data.   |
| <b>summary</b>                          |  | (Optional) Displays summary data.                    |

**Command Modes** Privileged EXEC(#)

| Command History | Release                        | Modification   |
|-----------------|--------------------------------|--|
|                 | Cisco IOS XE Everest 16.5.1a   | This command was implemented on the Cisco Catalyst 9500 Series Switches                      |
|                 | Cisco IOS XE Gibraltar 16.10.1 | The output of this command was updated to display the reload reasons for members in a stack. |

## Examples:

The following is a sample output from the **show logging onboard switch active uptime continuous** command:

```
Device# show logging onboard switch active uptime continuous
-----
UPTIME CONTINUOUS INFORMATION
-----
Time Stamp          | Reset              | Uptime
MM/DD/YYYY HH:MM:SS | Reason            | years weeks days hours minutes
-----
06/17/2018 19:42:56 | Reload            | 0   0   0   0   5
06/17/2018 19:56:31 | Reload            | 0   0   0   0   5
06/17/2018 20:10:46 | Reload            | 0   0   0   0   5
06/17/2018 20:23:48 | Reload            | 0   0   0   0   5
06/17/2018 20:37:20 | Reload Command    | 0   0   0   0   5
06/18/2018 17:09:23 | Reload Command    | 0   0   0   20  5
06/18/2018 17:18:39 | redundancy force-switchover | 0   0   0   0   5
06/18/2018 18:33:33 | Reload            | 0   0   0   1   5
06/18/2018 19:03:05 | Reload            | 0   0   0   0   5
```

## show logging onboard switch uptime

```

06/18/2018 19:40:30 Reload 0 0 0 0 5
06/18/2018 20:37:47 Reload 0 0 0 0 5
06/18/2018 20:51:13 Reload 0 0 0 0 5
06/18/2018 21:04:08 Reload 0 0 0 0 5
06/18/2018 21:18:23 Reload 0 0 0 0 5
06/18/2018 21:31:25 Reload 0 0 0 0 5
06/18/2018 21:45:15 Reload 0 0 0 0 5
06/18/2018 21:59:02 Reload 0 0 0 0 5
06/18/2018 22:11:41 Reload 0 0 0 0 5
06/18/2018 22:24:27 Reload 0 0 0 0 5
06/18/2018 22:39:14 Reload Command 0 0 0 0 4
06/19/2018 00:01:59 Reload Command 0 0 0 1 5
06/19/2018 00:13:21 redundancy force-switchover 0 0 0 0 5
06/19/2018 01:05:42 redundancy force-switchover 0 0 0 0 5
06/20/2018 02:37:16 redundancy force-switchover 0 0 1 1 5
06/20/2018 02:50:03 redundancy force-switchover 0 0 0 0 5
06/20/2018 03:02:13 redundancy force-switchover 0 0 0 0 5
06/20/2018 03:14:26 redundancy force-switchover 0 0 0 0 5
06/20/2018 03:26:44 redundancy force-switchover 0 0 0 0 5
06/20/2018 03:38:58 redundancy force-switchover 0 0 0 0 5
06/20/2018 03:52:43 redundancy force-switchover 0 0 0 0 5
06/20/2018 04:05:16 redundancy force-switchover 0 0 0 0 5
.
.
.

```

The following is a sample output from the **show logging onboard switch active uptime detail** command:

```
Device# show logging onboard switch active uptime detail
```

```
-----
UPTIME SUMMARY INFORMATION
-----
```

```

First customer power on : 06/10/2017 09:28:22
Total uptime           : 0 years 50 weeks 4 days 13 hours 38 minutes
Total downtime        : 0 years 15 weeks 4 days 11 hours 52 minutes
Number of resets       : 75
Number of slot changes : 9
Current reset reason   : PowerOn
Current reset timestamp : 09/17/2018 10:59:57
Current slot           : 1
Chassis type           : 0
Current uptime         : 0 years 0 weeks 0 days 0 hours 0 minutes
-----

```

```
-----
UPTIME CONTINUOUS INFORMATION
-----
```

| Time Stamp          | Reset Reason   | Uptime                         |
|---------------------|----------------|--------------------------------|
| MM/DD/YYYY HH:MM:SS | Reason         | years weeks days hours minutes |
| 06/10/2017 09:28:22 | Reload         | 0 0 0 0 0                      |
| <snip>              |                |                                |
| 09/17/2018 09:07:44 | PowerOn        | 0 0 3 15 5                     |
| 09/17/2018 10:16:26 | Reload Command | 0 0 0 1 5                      |
| 09/17/2018 10:59:57 | PowerOn        | 0 0 0 0 5                      |

The following is a sample output from the **show logging onboard switch standby uptime detail** command:

```
Device# show logging onboard switch standby uptime detail
```

```
-----
UPTIME SUMMARY INFORMATION
-----
```



```

First customer power on : 06/10/2017 11:51:26
Total uptime           : 0 years 46 weeks 0 days 11 hours 44 minutes
Total downtime        : 0 years 20 weeks 1 days 10 hours 45 minutes
Number of resets       : 79
Number of slot changes : 13
Current reset reason   : PowerOn
Current reset timestamp : 09/17/2018 10:59:57
Current slot          : 2
Chassis type          : 0
Current uptime        : 0 years 0 weeks 0 days 0 hours 5 minutes

```

---

 UPTIME CONTINUOUS INFORMATION
 

---

| Time Stamp          | Reset                       | Uptime                         |
|---------------------|-----------------------------|--------------------------------|
| MM/DD/YYYY HH:MM:SS | Reason                      | years weeks days hours minutes |
| 06/10/2017 11:51:26 | Reload                      | 0 0 0 0 0                      |
| <snip>              |                             |                                |
| 08/10/2018 09:13:58 | LocalSoft                   | 0 0 2 5 4                      |
| 08/28/2018 14:21:42 | Reload Slot Command         | 0 0 0 3 5                      |
| 08/28/2018 14:34:29 | System requested reload     | 0 0 0 0 0                      |
| 09/11/2018 09:08:15 | Reload                      | 0 0 1 8 5                      |
| 09/11/2018 19:15:06 | redundancy force-switchover | 0 0 0 9 4                      |
| 09/13/2018 16:50:18 | Reload Command              | 0 0 1 21 6                     |
| 09/17/2018 10:55:09 | PowerOn                     | 0 0 0 0 5                      |

The following is a sample output from the **show logging onboard switch active uptime summary** command:

```
Device# show logging onboard switch active uptime summary
```

---

 UPTIME SUMMARY INFORMATION
 

---

```

First customer power on : 04/26/2018 21:45:39
Total uptime           : 0 years 20 weeks 2 days 12 hours 22 minutes
Total downtime        : 0 years 2 weeks 2 days 8 hours 40 minutes
Number of resets       : 1900
Number of slot changes : 18
Current reset reason   : Reload Command
Current reset timestamp : 09/26/2018 20:43:15
Current slot          : 1
Chassis type          : 91
Current uptime        : 0 years 0 weeks 5 days 22 hours 5 minutes

```

# show license all

To display all licensing information enter the **show license all** command in privileged EXEC mode. This command displays status, authorization, UDI, and usage information, all combined.

## show license all

### Syntax Description

This command has no arguments or keywords.

### Command Default

Privileged EXEC (#)

### Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | Command output was updated to display information relating to Smart Licensing Using Policy.<br>Command output no longer displays Smart Account and Virtual account information. |

### Usage Guidelines

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing (whether smart licensing is enabled, all associated licensing certificates, compliance status, and so on).

### Examples

[show license all for Smart Licensing Using Policy, on page 106](#)

[show license all for Smart Licensing, on page 108](#)

### show license all for Smart Licensing Using Policy

The following is sample output from the **show license all** command on a Cisco Catalyst 9500 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches.

```
Device# show license all

Smart Licensing Status
=====
Smart Licensing is ENABLED
License Reservation is ENABLED
Export Authorization Key:
  Features Authorized:
    <none>
Utility:
  Status: DISABLED
Smart Licensing Using Policy:
  Status: ENABLED
Data Privacy:
  Sending Hostname: yes
```

```

    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
Version privacy: DISABLED
Transport:
  Type: Transport Off
Miscellaneous:
  Custom Id: <empty>
Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
Unenforced/Non-Export Perpetual Attributes:
  First report requirement (days): 365 (CISCO default)
  Reporting frequency (days): 0 (CISCO default)
  Report on change (days): 90 (CISCO default)
Unenforced/Non-Export Subscription Attributes:
  First report requirement (days): 90 (CISCO default)
  Reporting frequency (days): 90 (CISCO default)
  Report on change (days): 90 (CISCO default)
Enforced (Perpetual/Subscription) License Attributes:
  First report requirement (days): 0 (CISCO default)
  Reporting frequency (days): 0 (CISCO default)
  Report on change (days): 0 (CISCO default)
Export (Perpetual/Subscription) License Attributes:
  First report requirement (days): 0 (CISCO default)
  Reporting frequency (days): 0 (CISCO default)
  Report on change (days): 0 (CISCO default)
Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Nov 29 10:50:05 2020 PDT
  Reporting Interval: 30
  Next ACK push check: <none>
  Next report push: Aug 31 10:52:05 2020 PDT
  Last report push: <none>
  Last report file write: <none>
Trust Code Installed: <none>
License Usage
=====
network-advantage (C9500 Network Advantage):
  Description: network-advantage
  Count: 2
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: network-advantage
  Feature Description: network-advantage
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 2
dna-advantage (C9500-16X DNA Advantage):
  Description: C9500-16X DNA Advantage
  Count: 2
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: dna-advantage
  Feature Description: C9500-16X DNA Advantage
  Enforcement type: NOT ENFORCED
  License type: Subscription
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 2
Product Information

```

## show license all

```

=====
UDI: PID:C9500-16X,SN:FCW2233A5ZV
HA UDI List:
  Active:PID:C9500-16X,SN:FCW2233A5ZV
  Standby:PID:C9500-16X,SN:FCW2233A5ZY
Agent Version
=====
Smart Agent for Licensing: 5.0.5_rel/42
License Authorizations
=====
Overall status:
  Active: PID:C9500-16X,SN:FCW2233A5ZV
    Status: SPECIFIC INSTALLED on Aug 31 10:15:01 2020 PDT
    Last Confirmation code: 4bfbea7f
  Standby: PID:C9500-16X,SN:FCW2233A5ZY
    Status: SPECIFIC INSTALLED on Aug 31 10:15:01 2020 PDT
    Last Confirmation code: 9394f196
Specified license reservations:
  C9500 Network Advantage (C9500 Network Advantage):
    Description: C9500 Network Advantage
    Total reserved count: 2
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:C9500-16X,SN:FCW2233A5ZV
        Authorization type: SPECIFIC INSTALLED on Aug 31 10:15:01 2020 PDT
        License type: PERPETUAL
        Term Count: 1
      Standby: PID:C9500-16X,SN:FCW2233A5ZY
        Authorization type: SPECIFIC INSTALLED on Aug 31 10:15:01 2020 PDT
        License type: PERPETUAL
        Term Count: 1
  C9500-DNA-16X-A (C9500-16X DNA Advantage):
    Description: C9500-DNA-16X-A
    Total reserved count: 2
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:C9500-16X,SN:FCW2233A5ZV
        Authorization type: SPECIFIC INSTALLED on Aug 31 10:15:01 2020 PDT
        License type: PERPETUAL
        Term Count: 1
      Standby: PID:C9500-16X,SN:FCW2233A5ZY
        Authorization type: SPECIFIC INSTALLED on Aug 31 10:15:01 2020 PDT
        License type: PERPETUAL
        Term Count: 1
Purchased Licenses:
  No Purchase Information Available
Derived Licenses:
  Entitlement Tag:
  regid.2017-03.com.cisco.advantagek9-Nyquist-C9500,1.0_f1563759-2e03-4a4c-bec5-5feec525a12c
  Entitlement Tag:
  regid.2017-07.com.cisco.C9500-DNA-16X-A,1.0_ef3574d1-156b-486a-864f-9f779ff3ee49

```

**show license all for Smart Licensing**

The following is sample output from the **show license all** command:

```

Device# show license all
Smart Licensing Status
=====

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED

```

```
Smart Account: CISCO Systems
Virtual Account: NPR
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Jul 16 09:44:50 2018 IST
Last Renewal Attempt: None
Next Renewal Attempt: Jan 12 09:44:49 2019 IST
Registration Expires: Jul 16 09:39:05 2019 IST

License Authorization:
  Status: AUTHORIZED on Jul 31 17:30:02 2018 IST
  Last Communication Attempt: SUCCEEDED on Jul 31 17:30:02 2018 IST
  Next Communication Attempt: Aug 30 17:30:01 2018 IST
  Communication Deadline: Oct 29 17:24:12 2018 IST

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Data Privacy:
  Sending Hostname: yes
  Callhome hostname privacy: DISABLED
  Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Callhome

License Usage
=====

C9500 48Y4C DNA Advantage (C9500-DNA-48Y4C-A):
  Description: C9500 48Y4C DNA Advantage
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

C9500 48Y4C NW Advantage (C9500-48Y4C-A):
  Description: C9500 48Y4C NW Advantage
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

Product Information
=====
UDI: PID:C9500-48Y4C,SN:CAT2150L5HK

Agent Version
=====
Smart Agent for Licensing: 4.5.2_rel/32
Component Versions: SA:(1_3_dev)1.0.15, SI:(dev22)1.2.1, CH:(rel5)1.0.3, PK:(dev18)1.0.3

Reservation Info
=====
License reservation: DISABLED
```

**Related Commands**

| <b>Command</b>                    | <b>Description</b>                               |
|-----------------------------------|--|
| <b>show license status</b>        | Displays compliance status of a license.         |
| <b>show license authorization</b> | Displays authorization code-related information. |
| <b>show license summary</b>       | Displays summary of all active licenses.         |
| <b>show license udi</b>           | Displays UDI.                                    |
| <b>show license usage</b>         | Displays license usage information               |
| <b>show license tech support</b>  | Displays the debug output.                       |

# show license authorization

To display authorization-related information for (export-controlled and enforced) licenses, enter the **show license authorization** command in privileged EXEC mode.

## show license authorization

This command has no arguments or keywords.

---

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

---

| <b>Command History</b> | <b>Release</b>                 | <b>Modification</b>          |
|------------------------|--------------------------------|------------------------------|
|                        | Cisco IOS XE Amsterdam 17.3.2a | This command was introduced. |

---

---

**Usage Guidelines** While there are no export-controlled or enforced licenses on Cisco Catalyst Access, Core, and Aggregation Switches, you can use this command to display migrated SLR authorization codes.

## Examples

See [Table 6: show license authorization Field Descriptions, on page 112](#) for information about fields shown in the display.

See [show license authorization Displaying Migrated SLR Authorization Code, on page 114](#) for sample output.

Table 6: show license authorization Field Descriptions

| Field               | Description  |
|---------------------|--|
| Overall Status      | <p>Header for UDI information for all product instances in the set-up, the type of authorization that is installed, and configuration errors, if any.</p> <p>In a High Availability set-up, all UDIs in the set-up are listed.</p>                     |
| Active:<br>Status:  | <p>The active product instance UDI, followed by the status of the authorization code installation for this UDI.</p> <p>If the status indicates that the authorization code is installed and there is a confirmation code, this is also displayed.</p>  |
| Standby:<br>Status: | <p>The standby product instance UDI, followed by the status of the authorization code installation for this UDI.</p> <p>If the status indicates that the authorization code is installed and there is a confirmation code, this is also displayed.</p> |
| Member:<br>Status:  | <p>The member product instance UDI, followed by the status of the authorization code installation for this UDI.</p> <p>If the status indicates that the authorization code is installed and there is a confirmation code, this is also displayed.</p>  |
| ERROR:              | <p>Configuration errors or discrepancies in the High Availability set-up, if any.</p>  |



| Field                  | Description   |
|------------------------|---|
| Authorizations         | <p>Header for detailed license authorization information. All licenses, their enforcement types, and validity durations are displayed. Errors are displayed for each product instance if its authorization or mode does not match what is installed on the active.</p> <p>This section is displayed only if the product instance is using a license with an authorization code.</p>   |
| ():                    | License name and a shortened form of the license name.  |
| Description            | License description.  |
| Total available count: | <p>Total count of licenses that are available to consume.</p> <p>This includes licenses of all durations (perpetual and subscription), including expired subscription licenses, for all the product instances in a High Availability setup.</p>   |
| Enforcement type       | <p>Enforcement type for the license. This may be one of the following:</p> <ul style="list-style-type: none"> <li>• Enforced</li> <li>• Not enforced</li> <li>• Export-Controlled</li> </ul>  |
| Term information:      | <p>Header providing license duration information. The following fields maybe included under this header:</p> <ul style="list-style-type: none"> <li>• Active: The active product instance UDI, followed by the status of the authorization code installation for this UDI.</li> <li>• Authorization type: Type of authorization code installed and date of installation. The type can be: SLAC, UNIVERSAL, SPECIFIED, PAK, RTU.</li> <li>• Start Date: Displays validity start date if the license is for a specific term or time period.</li> <li>• Start Date: Displays validity end date if the license is for a specific term or time period.</li> <li>• Term Count: License count.</li> <li>• Subscription ID: Displays ID if the license is for a specific term or time period.</li> <li>• License type: License duration. This can be: SUBSCRIPTION or PERPETUAL.</li> <li>• Standby: The standby product instance UDI, followed by the status of the authorization code installation for this UDI.</li> <li>• Member: The member product instance UDI, followed by the status of the authorization code installation for this UDI.</li> </ul> |

| Field              | Description   |
|--------------------|---|
| Purchased Licenses | Header for license purchase information.                  |
| Active:            | The active product instance and its the UDI.              |
| Count:             | License count.  |
| Description:       | License description.                                      |
| License type:      | License duration. This can be: SUBSCRIPTION or PERPETUAL. |
| Standby:           | The standby product instance UDI.                         |
| Member:            | The member product instance UDI.                          |

### show license authorization Displaying Migrated SLR Authorization Code

The following is sample output of the **show license authorization** command showing SLR authorization codes (Last Confirmation code:), which have been migrated to Smart Licensing Using Policy.

Device# **show license authorization**

Overall status:

```
Active: PID:C9500-16X,SN:FCW2233A5ZV
      Status: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      Last Confirmation code: 184ba6d6
Standby: PID:C9500-16X,SN:FCW2233A5ZY
      Status: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      Last Confirmation code: 961d598f
```

Specified license reservations:

```
C9500 Network Advantage (C9500 Network Advantage):
  Description: C9500 Network Advantage
  Total reserved count: 2
  Enforcement type: NOT ENFORCED
  Term information:
    Active: PID:C9500-16X,SN:FCW2233A5ZV
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Term Count: 1
    Standby: PID:C9500-16X,SN:FCW2233A5ZY
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Term Count: 1
C9500-DNA-16X-A (C9500-16X DNA Advantage):
  Description: C9500-DNA-16X-A
  Total reserved count: 2
  Enforcement type: NOT ENFORCED
  Term information:
    Active: PID:C9500-16X,SN:FCW2233A5ZV
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Term Count: 1
    Standby: PID:C9500-16X,SN:FCW2233A5ZY
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Term Count: 1
```

Purchased Licenses:

No Purchase Information Available

Derived Licenses:

Entitlement Tag:

regid.2017-03.com.cisco.advantagek9-Nyquist-C9500,1.0\_f1563759-2e03-4a4c-bec5-5feec525a12c

Entitlement Tag:

regid.2017-07.com.cisco.C9500-DNA-16X-A,1.0\_ef3574d1-156b-486a-864f-9f779ff3ee49

# show license data conversion

To display license data conversion information, enter the **show license data** command in privileged EXEC mode.

**show license data conversion**

## Syntax Description

This command has no keywords or arguments

## Command Modes

Privileged EXEC (Device#)

## Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | Command output was updated to display information relating to Smart Licensing Using Policy.<br><br>Command output no longer displays Smart Account and Virtual account information. |

## Usage Guidelines

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

Device-led conversion is not supported on Cisco Catalyst Access, Core, and Aggregation Switches.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

# show license eventlog

To display event logs relating to Smart Licensing Using Policy, enter the **show license eventlog** command in privileged EXEC mode.

**show license eventlog** [ *days* ]

## Syntax Description

*days* Enter the number of days for which you want to display event logs. The valid value range is from 0 to 2147483647.

## Command Modes

Privileged EXEC (Device#)

## Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | Additional events were added with the introduction of Smart Licensing Using Policy: <ul style="list-style-type: none"> <li>• Installation and removal of a policy</li> <li>• Request, installation and removal of an authorization code.</li> <li>• Installation and removal of a trust code.</li> <li>• Addition of authorization source information for license usage.</li> </ul> |

## Usage Guidelines

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

## Examples

[show license eventlog for One Day, for Smart Licensing Using Policy, on page 117](#)

[show license eventlog for All Events, for Smart Licensing Using Policy, on page 118](#)

### show license eventlog for One Day, for Smart Licensing Using Policy

The following is sample output from the **show license eventlog** command on a Cisco Catalyst 9500 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches. The command is configured to display events for one day.

```
Device# show license eventlog 1
**** Event Log ****

2020-09-11 00:50:17.693 EDT SAEVT_PLATFORM eventSource="INFRA_SL"
eventName="INFRA_SL_EVLOG_ERM_RESET" MSG="ERM-Reset: Client 0, AP-GROUP group, 2 features
air-network-advantage,air-dna-advantage"
2020-09-11 00:50:17.695 EDT SAEVT_ENDPOINT_USAGE count="0"
```

## show license eventlog

```

entitlementTag="regid.2018-06.com.cisco.DNA_NWStack,1.0_e7244e71-3ad5-4608-8bf0-d12f67c80896"
2020-09-11 00:50:17.695 EDT SAEVT_ENDPOINT_USAGE count="0"
entitlementTag="regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790"
2020-09-11 00:50:50.175 EDT SAEVT_POLL_MESSAGE messageType="LICENSE_USAGE"
2020-09-11 08:50:17.694 EDT SAEVT_PLATFORM eventSource="INFRA_SL"
eventName="INFRA_SL_EVLOG_ERM_RESET" MSG="ERM-Reset: Client 0, AP-GROUP group, 2 features
air-network-advantage,air-dna-advantage"
2020-09-11 08:50:17.696 EDT SAEVT_ENDPOINT_USAGE count="0"
entitlementTag="regid.2018-06.com.cisco.DNA_NWStack,1.0_e7244e71-3ad5-4608-8bf0-d12f67c80896"
2020-09-11 08:50:17.696 EDT SAEVT_ENDPOINT_USAGE count="0"
entitlementTag="regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790"
2020-09-11 08:50:52.804 EDT SAEVT_POLL_MESSAGE messageType="LICENSE_USAGE"

```

**show license eventlog for All Events, for Smart Licensing Using Policy**

The following is sample output from the **show license eventlog** command on a Cisco Catalyst 9500 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches. The command is configured to display all events.

```
Device# show license eventlog
```

```
**** Event Log ****
```

```

2020-09-01 15:43:42.300 UTC SAEVT_INIT_START version="4.13.14_rel/41"
2020-09-01 15:43:42.301 UTC SAEVT_INIT_CRYPTO success="False" error="Crypto Initialization
has not been completed"
2020-09-01 15:43:42.301 UTC SAEVT_HA_EVENT eventType="SmartAgentEvtHarmfRegister"
2020-09-01 15:43:45.055 UTC SAEVT_READY
2020-09-01 15:43:45.055 UTC SAEVT_ENABLED
2020-09-01 15:43:45.088 UTC SAEVT_PLATFORM eventSource="INFRA_SL"
eventName="INFRA_SL_EVLOG_SYSDATA_FAIL" MSG="Get-SDL: not the active switch"
2020-09-01 15:43:45.089 UTC SAEVT_PLATFORM eventSource="INFRA_SL"
eventName="INFRA_SL_EVLOG_SYSDATA_FAIL" MSG="Get-SDL: not the active switch"
2020-09-01 15:43:45.089 UTC SAEVT_PLATFORM eventSource="INFRA_SL"
eventName="INFRA_SL_EVLOG_SYSDATA_FAIL" MSG="Get-SDL: not the active switch"
2020-09-01 15:43:45.089 UTC SAEVT_LICENSE_USAGE count="0" type="destroy"
entitlementTag="regid.2018-01.com.cisco.C9500-24Y4C-A,1.0_6b065611-6552-472a-8859-ab3339550166"
2020-09-01 15:43:45.098 UTC SAEVT_PLATFORM eventSource="INFRA_SL"
eventName="INFRA_SL_EVLOG_SYSDATA_FAIL" MSG="Get-SDL: not the active switch"

```

## show license history message

To display communication history between the product instance and CSSM or CSLU (as the case may be), enter the **show license history message** command in privileged EXEC mode. The output of this command is used by the technical support team, for troubleshooting.

**show license history message**

---

### Syntax Description

This command has no keywords or arguments.

---

### Command Modes

Privileged EXEC (Device#)

---

### Command History

| Release                        | Modification                 |
|--------------------------------|------------------------------|
| Cisco IOS XE Amsterdam 17.3.2a | This command was introduced. |

---

### Usage Guidelines

When you encounter an error message that you are not able to resolve, along with a copy of the message that appears on the console or in the system log, provide your Cisco technical support representative with sample output of these commands: **show license tech support**, **show license history message**, and the **show platform software sl-infra all** privileged EXEC commands.

# show license reservation

To display license reservation information, enter the **show license reservation** command in privileged EXEC mode.

## show license reservation

This command has no arguments or keywords.

### Command Modes

Privileged EXEC (Device#)

### Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | The command continues to be available on the CLI, but is no longer applicable because the notion of reservation does not exist in the Smart Licensing Using Policy environment. |

### Usage Guidelines

The command continues to be available on the CLI and corresponding output is displayed, but with the introduction of Smart Licensing Using Policy, the notion of reservation is no longer applicable. Use the **show license all** command in privileged EXEC mode, to display *migrated* SLR licenses instead (the SLR authorization code is migrated to Smart Licensing Using Policy).



# show license status

To display information about licensing settings such as data privacy, policy, transport, usage reporting and trust codes, enter the **show license status** command in privileged EXEC mode.

## show license status

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

**Command Default** Privileged EXEC (#)

| Command History | Release                        | Modification   |
|-----------------|--------------------------------|--|
|                 | Cisco IOS XE Fuji 16.9.1       | This command was introduced.   |
|                 | Cisco IOS XE Amsterdam 17.3.2a | Command output was updated to reflect new fields that are applicable to Smart Licensing Using Policy. This includes <code>Trust code installed:</code> , <code>Policy in use</code> , <code>Policy name:</code> , reporting requirements as in the policy, and <code>Usage Reporting:</code> .<br><br>Command output no longer displays Smart Account and Virtual account information. |

**Usage Guidelines** **Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

## Examples

See [Table 7: show license status Field Descriptions for Smart Licensing Using Policy, on page 122](#) for information about fields shown in the display.

[show license status for Smart Licensing Using Policy, on page 127](#)

[show license status for Smart Licensing, on page 128](#)

Table 7: show license status Field Descriptions for Smart Licensing Using Policy

| Field                         | Description  |   |
|-------------------------------|--|---|
| Utility                       | Header for utility settings that are configured on the product instance. |   |
|                               | Status:  | Status  |
|                               | Utility report:  | Last attempt:   |
|                               | Customer Information:  | The following fields are displayed: <ul style="list-style-type: none"> <li>• Id:</li> <li>• Name:</li> <li>• Street</li> <li>• City:</li> <li>• State:</li> <li>• Country:</li> <li>• Postal Code:</li> </ul>             |
| Smart Licensing Using Policy: | Header for policy settings on the product instance.                      |   |
|                               | Status:  | Indicates if Smart Licensing Using Policy is enabled.<br>Smart Licensing Using Policy is supported starting from Cisco IOS XE Amsterdam 17.3.2 and is always enabled on supported software images.                        |
| Data Privacy:                 | Header for privacy settings that are configured on the product instance. |   |
|                               | Sending Hostname:  | A <i>yes</i> or <i>no</i> value which shows if the hostname is sent in usage reports.   |
|                               | Callhome hostname privacy:   | Indicates if the Call Home feature is configured as the mode of transport for reporting. If configured, one of these values is displayed: <ul style="list-style-type: none"> <li>• ENABLED</li> <li>• DISABLED</li> </ul> |
|                               | Smart Licensing hostname privacy:  | One of these values is displayed: <ul style="list-style-type: none"> <li>• ENABLED</li> <li>• DISABLED</li> </ul>   |
|                               | Version privacy:   | One of these values is displayed: <ul style="list-style-type: none"> <li>• ENABLED</li> <li>• DISABLED</li> </ul>   |

| Field      | Description  |
|------------|--|
| Transport: | Header for transport settings that are configured on the product instance.   |
|            | Type: Mode of transport that is in use.<br>Additional fields are displayed for certain transport modes. For example, if transport type is set to CSLU, the CSLU address is also displayed. |

| Field   | Description  |
|---------|--|
| Policy: | Header for policy information that is applicable to the product instance.  |
|         | Policy in use:<br>Policy that is applied<br><br>This can be one of the following: Cisco default, Product default, Permanent License Reservation, Specific License Reservation, PAK license, Installed on <date>, Controller.   |
|         | Policy name:<br>Name of the policy   |
|         | Reporting ACK required:<br>A <i>yes</i> or <i>no</i> value which specifies if the report for this product instance requires CSSM acknowledgement (ACK) or not. The default policy is always set to “yes”.  |
|         | Unenforced/Non-Export Perpetual Attributes<br><br>Displays policy values for perpetual licenses. <ul style="list-style-type: none"> <li>• First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name.</li> <li>• Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name.</li> <li>• Report on change (days): he maximum amount of time available to send a report in case of a change in license usage, followed by policy name</li> </ul>       |
|         | Unenforced/Non-Export Subscription Attributes<br><br>Displays policy values for subscription licenses. <ul style="list-style-type: none"> <li>• First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name.</li> <li>• Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name.</li> <li>• Report on change (days): he maximum amount of time available to send a report in case of a change in license usage, followed by policy name</li> </ul> |
|         | Enforced (Perpetual/Subscription) License Attributes   |

| Field         |  | Description  |
|---------------|--|--|
|               |  | <p>Displays policy values for enforced licenses.</p> <ul style="list-style-type: none"> <li>• First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name.</li> <li>• Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name.</li> <li>• Report on change (days): The maximum amount of time available to send a report in case of a change in license usage, followed by policy name</li> </ul>          |
|               | Export<br>(Perpetual/Subscription)<br>License Attributes | <p>Displays policy values for export-controlled licenses.</p> <ul style="list-style-type: none"> <li>• First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name.</li> <li>• Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name.</li> <li>• Report on change (days): The maximum amount of time available to send a report in case of a change in license usage, followed by policy name</li> </ul> |
| Miscellaneous | Header for custom ID.                                    |  |
|               | Custom Id:   | ID   |

| Field                   | Description   |
|-------------------------|---|
| Usage Reporting:        | Header for usage reporting (RUM reports) information.   |
| Last ACK received:      | Date and time of last ACK received, in the local time zone.   |
| Next ACK deadline:      | Date and time for next ACK. If the policy states that an ACK is not required then this field displays <code>none</code> .<br><br><b>Note</b> If an ACK is required and is not received by this deadline, a syslog is displayed.   |
| Reporting Interval:     | Reporting interval in days<br><br>The value displayed here depends on what you configure in the <b>license smart usage interval</b> <code>interval_in_days</code> and the policy value. For more information, see the corresponding Syntax Description: <a href="#">Table 7: show license status Field Descriptions for Smart Licensing Using Policy</a> , on page 122. |
| Next ACK push check:    | Date and time when the product instance will submit the next polling request for an ACK. Date and time are in the local time zone.<br><br>This applies only to product instance- initiated communication to CSSM or CSLU. If the reporting interval is zero, or if no ACK polling is pending, then this field displays <code>none</code> .                              |
| Next report push:       | Date and time when the product instance will send the next RUM report. Date and time are in the local time zone. If the reporting interval is zero, or if there are no pending RUM reports, then this field displays <code>none</code> .  |
| Last report push:       | Date and time for when the product instance sent the last RUM report. Date and time are in the local time zone.   |
| Last report file write: | Date and time for when the product instance last saved an offline RUM report. Date and time are in the local time zone.   |
| Last report pull:       | Date and time for when usage reporting information was retrieved using data models. Date and time are in the local time zone.   |

| Field                    | Description  |
|--------------------------|--|
| Trust Code<br>Installed: | Header for trust code-related information.<br><br>Displays date and time if trust code is installed. Date and time are in the local time zone.<br><br>If a trust code is not installed, then this field displays <i>none</i> . |
| Active:                  | Active product instance.<br><br>In a High Availability set-up, the the UDIs of all product instances in the set-up, along with corresponding trust code installation dates and times are displayed.                            |
| Standby:                 | Standby product instance.  |
| Member:                  | Member product instance  |

### show license status for Smart Licensing Using Policy

The following is sample output of the **show license status** command. A Cisco default policy (merged from multiple sources) is applied here, on a Cisco Catalyst 9500 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches.

```
Device# show license status
Utility:
  Status: DISABLED
License Reservation is ENABLED
Data Privacy:
  Sending Hostname: yes
  Callhome hostname privacy: DISABLED
  Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED
Transport:
  Type: Transport Off
Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
Miscellaneous:
  Custom Id: <empty>
Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Nov 29 10:50:05 2020 PDT
  Reporting Interval: 30
```

```

Next ACK push check: <none>
Next report push: Aug 31 10:52:05 2020 PDT
Last report push: <none>
Last report file write: <none>
Trust Code Installed: <none>

```

### show license status for Smart Licensing

The following is sample output of the **show license status** command.

```

Device# show license status

Smart Licensing is ENABLED

Utility:
  Status: DISABLED

Data Privacy:
  Sending Hostname: yes
  Callhome hostname privacy: DISABLED
  Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Callhome

Registration:
  Status: REGISTERED
  Smart Account: Cisco Systems
  Virtual Account: NPR
  Export-Controlled Functionality: Allowed
  Initial Registration: First Attempt Pending
  Last Renewal Attempt: SUCCEEDED on Jul 19 14:49:49 2018 IST
  Next Renewal Attempt: Jan 15 14:49:47 2019 IST
  Registration Expires: Jul 19 14:43:47 2019 IST

License Authorization:
  Status: AUTHORIZED on Jul 28 07:02:56 2018 IST
  Last Communication Attempt: SUCCEEDED on Jul 28 07:02:56 2018 IST
  Next Communication Attempt: Aug 27 07:02:56 2018 IST
  Communication Deadline: Oct 26 06:57:50 2018 IST

```

#### Related Commands

| Command                           | Description                                      |
|-----------------------------------|--|
| <b>show license all</b>           | Displays entitlements information.               |
| <b>show license authorization</b> | Displays authorization code-related information. |
| <b>show license summary</b>       | Displays summary of all active licenses.         |
| <b>show license udi</b>           | Displays UDI.                                    |
| <b>show license usage</b>         | Displays license usage information               |
| <b>show tech-support license</b>  | Displays the debug output.                       |



# show license summary

To display a brief summary of license usage, which includes information about licenses being used, the count, and status, use the **show license summary** command in privileged EXEC mode.

## show license summary

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

**Command Default** Privileged EXEC (#)

| Command History | Release                        | Modification   |
|-----------------|--------------------------------|--|
|                 | Cisco IOS XE Fuji 16.9.1       | This command was introduced.   |
|                 | Cisco IOS XE Amsterdam 17.3.2a | <p>Command output was updated to reflect valid license status for Smart Licensing Using Policy. Valid license statuses are now only IN USE, NOT IN USE, NOT AUTHORIZED.</p> <p>Command output was also updated to remove registration and authorization information.</p> <p>Command output no longer displays Smart Account and Virtual account information.</p> |

**Usage Guidelines** **Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

The licenses on Cisco Catalyst Access, Core, and Aggregation Switches are never NOT AUTHORIZED or NOT IN USE, because none of the available licenses are export-controlled or enforced (Only these licenses require authorization before use).

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing (summary of all active licenses).

## Examples

See [Table 8: show license summary Field Descriptions for Smart Licensing Using Policy, on page 129](#) for information about fields shown in the display.

[show license summary for Smart Licensing Using Policy \(Cisco Catalyst 9300 Series Switches\), on page 130](#)

[show license summary for Smart Licensing Using Policy \(Cisco Catalyst 9500 Series Switches\), on page 130](#)

[show license summary for Smart Licensing, on page 130](#)

**Table 8: show license summary Field Descriptions for Smart Licensing Using Policy**

| Field   | Description                 |
|---------|-----------------------------|
| License | Name of the licenses in use |

| Field           | Description   |
|-----------------|---|
| Entitlement Tag | Short name for license  |
| Count           | License count   |
| Status          | License status can be one of the following <ul style="list-style-type: none"> <li>• In-Use: Valid license, and in-use.</li> <li>• Not In-Use</li> <li>• Not Authorized: Means that the license requires installation of a Smart Licensing Authorization Code before use. (Not applicable to Cisco Catalyst Access, Core, and Aggregation Switches)</li> </ul> |

### show license summary for Smart Licensing Using Policy (Cisco Catalyst 9300 Series Switches)

The following is sample output of the **show license summary** command, on a Cisco Catalyst 9300 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches.

```
Device# show license summary
```

```
License Usage:
License           Entitlement Tag           Count Status
-----
network-essentials (C9300-24 Network Essen...) 2 IN USE
dna-essentials     (C9300-24 DNA Essentials) 2 IN USE
network-essentials (C9300-48 Network Essen...) 1 IN USE
dna-essentials     (C9300-48 DNA Essentials) 1 IN USE
```

### show license summary for Smart Licensing Using Policy (Cisco Catalyst 9500 Series Switches)

The following is sample output of the **show license summary** command on a Cisco Catalyst 9500 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches.

```
Device# show license summary
```

```
License Usage:
License           Entitlement tag           Count Status
-----
network-advantage (C9500 Network Advantage) 2 IN USE
dna-advantage     (C9500-16X DNA Advantage) 2 IN USE
```

### show license summary for Smart Licensing

This example shows a sample output from the **show license summary** command:

```
Device# show license summary Smart Licensing is ENABLED
```

```
Registration:
Status: REGISTERED
Smart Account: CISCO Systems
Virtual Account: NPR
Export-Controlled Functionality: Allowed
Last Renewal Attempt: None
Next Renewal Attempt: Jan 12 09:44:49 2019 IST
```

```
License Authorization:
Status: AUTHORIZED
```

Last Communication Attempt: SUCCEEDED  
 Next Communication Attempt: Aug 30 17:30:02 2018 IST

## License Usage:

| License                 | Entitlement tag     | Count | Status     |
|-------------------------|---------------------|-------|------------|
| C9500 48Y4C DNA Adva... | (C9500-DNA-48Y4C-A) | 1     | AUTHORIZED |
| C9500 48Y4C NW Advan... | (C9500-48Y4C-A)     | 1     | AUTHORIZED |

## Related Commands

| Command                          | Description                              |
|----------------------------------|--|
| <b>show license all</b>          | Displays entitlements information.       |
| <b>show license status</b>       | Displays compliance status of a license. |
| <b>show license udi</b>          | Displays UDI.                            |
| <b>show license usage</b>        | Displays license usage information       |
| <b>show tech-support license</b> | Displays the debug output.               |

# show license tech

To display licensing information to help the technical support team troubleshoot a problem, enter the **show license tech** command in privileged EXEC mode. The output for this command includes outputs of several other **show license** commands and more.

**show license tech** { **data conversion** | **eventlog** [ *days* ] | **reservation** | **support** }

## Syntax Description

**data conversion** Displays license data conversion information.

**eventlog** [ *days* ] Displays event logs related to Smart Licensing Using Policy.

For *days*, enter the number of days for which you want to display event logs. The valid value range is from 0 to 2147483647.

The output for this option is the same as the **show license eventlog** command.

**reservation** Displays license reservation information.

**support** Displays licensing information that helps the technical support team to debug a problem.

## Command Modes

Privileged EXEC (Device#)

## Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | Command output was updated to reflect new fields that are applicable to Smart Licensing Using Policy. |

## Usage Guidelines

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

When you encounter an error message that you are not able to resolve, along with a copy of the message that appears on the console or in the system log, provide your Cisco technical support representative with sample output of these commands: **show license tech support**, **show license history message**, and the **show platform software sl-infra all** privileged EXEC commands.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing (whether smart licensing is enabled, all associated licensing certificates, compliance status, and so on).

### show license tech support for Smart Licensing Using Policy

The following is sample output from the **show license tech support** command on a Cisco Catalyst 9500 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches.

```
Device# show license tech support
Smart Licensing Tech Support info
```

```
Smart Licensing Status
=====

Smart Licensing is ENABLED
License Reservation is ENABLED

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

Data Privacy:
  Sending Hostname: yes
  Callhome hostname privacy: DISABLED
  Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Transport Off

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Jan 27 09:49:33 2021 PST
  Reporting push interval: 30 days State(2) InPolicy(90)
  Next ACK push check: <none>
  Next report push: Oct 29 09:51:33 2020 PST
  Last report push: <none>
  Last report file write: <none>

License Usage
=====
Handle: 1
  License: network-advantage
  Entitlement Tag:
regid.2017-03.com.cisco.advantagek9-Nyquist-C9500,1.0_f1563759-2e03-4a4c-bec5-5feec525a12c
  Description: network-advantage
```

```

Count: 2
Version: 1.0
Status: IN USE(15)
Status time: Oct 29 09:48:54 2020 PST
Request Time: Oct 29 09:49:18 2020 PST
Export status: NOT RESTRICTED
Feature Name: network-advantage
Feature Description: network-advantage
Measurements:
  ENTITLEMENT:
    Interval: 00:15:00
    Current Value: 2
Soft Enforced: True

Handle: 2
License: dna-advantage
Entitlement Tag:
regid.2017-07.com.cisco.C9500-DNA-16X-A,1.0_ef3574d1-156b-486a-864f-9f779ff3ee49
Description: C9500-16X DNA Advantage
Count: 2
Version: 1.0
Status: IN USE(15)
Status time: Oct 29 09:48:54 2020 PST
Request Time: Oct 29 09:49:18 2020 PST
Export status: NOT RESTRICTED
Feature Name: dna-advantage
Feature Description: C9500-16X DNA Advantage
Measurements:
  ENTITLEMENT:
    Interval: 00:15:00
    Current Value: 2
Soft Enforced: True

Handle: 7
License: air-network-advantage
Entitlement Tag:
regid.2018-06.com.cisco.DNA_NWStack,1.0_e7244e71-3ad5-4608-8bf0-d12f67c80896
Description: air-network-advantage
Count: 0
Version: 1.0
Status: IN USE(15)
Status time: Oct 29 10:49:09 2020 PST
Request Time: None
Export status: NOT RESTRICTED
Feature Name: air-network-advantage
Feature Description: air-network-advantage
Measurements:
  ENTITLEMENT:
    Interval: 00:15:00
    Current Value: 0
Soft Enforced: True

Handle: 8
License: air-dna-advantage
Entitlement Tag: regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790

Description: air-dna-advantage
Count: 0
Version: 1.0
Status: IN USE(15)
Status time: Oct 29 10:49:09 2020 PST
Request Time: None
Export status: NOT RESTRICTED
Feature Name: air-dna-advantage

```

```

Feature Description: air-dna-advantage
Measurements:
  ENTITLEMENT:
    Interval: 00:15:00
    Current Value: 0
  Soft Enforced: True

```

Product Information

=====

UDI: PID:C9500-16X,SN:FCW2233A5ZV

HA UDI List:

```

Active:PID:C9500-16X,SN:FCW2233A5ZV
Standby:PID:C9500-16X,SN:FCW2233A5ZY

```

Agent Version

=====

Smart Agent for Licensing: 5.0.5\_rel/42

Upcoming Scheduled Jobs

=====

```

Current time: Oct 29 11:04:46 2020 PST
Daily: Oct 30 09:48:56 2020 PST (22 hours, 44 minutes, 10 seconds remaining)
Init Flag Check: Expired Not Rescheduled
Reservation configuration mismatch between nodes in HA mode: Nov 05 09:52:25 2020 PST (6
days, 22 hours, 47 minutes, 39 seconds remaining)
Start Utility Measurements: Oct 29 11:19:09 2020 PST (14 minutes, 23 seconds remaining)
Send Utility RUM reports: Oct 30 09:53:10 2020 PST (22 hours, 48 minutes, 24 seconds
remaining)
Save unreported RUM Reports: Oct 29 12:04:19 2020 PST (59 minutes, 33 seconds remaining)
Process Utility RUM reports: Oct 30 09:49:33 2020 PST (22 hours, 44 minutes, 47 seconds
remaining)
Data Synchronization: Expired Not Rescheduled
External Event: Nov 28 09:49:33 2020 PST (29 days, 22 hours, 44 minutes, 47 seconds remaining)
Operational Model: Expired Not Rescheduled

```

Communication Statistics:

=====

Communication Level Allowed: INDIRECT

Overall State: <empty>

Trust Establishment:

```

Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
Last Response: <none>
Failure Reason: <none>
Last Success Time: <none>
Last Failure Time: <none>

```

Trust Acknowledgement:

```

Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
Last Response: <none>
Failure Reason: <none>
Last Success Time: <none>
Last Failure Time: <none>

```

Usage Reporting:

```

Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
Last Response: <none>
Failure Reason: <none>
Last Success Time: <none>
Last Failure Time: <none>

```

Result Polling:

```

Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
Last Response: <none>
Failure Reason: <none>
Last Success Time: <none>
Last Failure Time: <none>

```

```

Authorization Request:
  Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
  Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Confirmation:
  Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
  Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Return:
  Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
  Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Trust Sync:
  Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
  Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Hello Message:
  Attempts: Total=0, Success=0, Fail=0 Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
  Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>

```

```

License Certificates
=====
Production Cert: True
Not registered. No certificates installed

```

```

HA Info
=====
RP Role: Active
Chassis Role: Active
Behavior Role: Active
RMF: True
CF: True
CF State: Stateless
Message Flow Allowed: False

```

```

Reservation Info
=====
License reservation: ENABLED

```

```

Overall status:
  Active: PID:C9500-16X,SN:FCW2233A5ZV
    Reservation status: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
    Request code: <none>
    Last return code: <none>
    Last Confirmation code: 184ba6d6
    Reservation authorization code:
    <tagDisplayName>C9500 Network</tagDisplayName><tagDescription>C9500 Network
  Standby: PID:C9500-16X,SN:FCW2233A5ZY
    Reservation status: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
    Request code: <none>

```



```

Last return code: <none>
Last Confirmation code: 961d598f
Reservation authorization code:
Network Advantage</displayName><tagDescription>C9500 Network
Specified license reservations:
C9500 Network Advantage (C9500 Network Advantage):
  Description: C9500 Network Advantage
  Total reserved count: 2
  Enforcement type: NOT ENFORCED
  Term information:
    Active: PID:C9500-16X,SN:FCW2233A5ZV
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Start Date: <none>
      End Date: <none>
      Term Count: 1
      Subscription ID: <none>
    Standby: PID:C9500-16X,SN:FCW2233A5ZY
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Start Date: <none>
      End Date: <none>
      Term Count: 1
      Subscription ID: <none>
C9500-DNA-16X-A (C9500-16X DNA Advantage):
  Description: C9500-DNA-16X-A
  Total reserved count: 2
  Enforcement type: NOT ENFORCED
  Term information:
    Active: PID:C9500-16X,SN:FCW2233A5ZV
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Start Date: <none>
      End Date: <none>
      Term Count: 1
      Subscription ID: <none>
    Standby: PID:C9500-16X,SN:FCW2233A5ZY
      Authorization type: SPECIFIC INSTALLED on Oct 29 09:44:06 2020 PST
      License type: PERPETUAL
      Start Date: <none>
      End Date: <none>
      Term Count: 1
      Subscription ID: <none>

Purchased Licenses:
  No Purchase Information Available

Other Info
=====
Software ID: regid.2017-05.com.cisco.C9500,v1_7435cf27-0075-4bf8-b67c-b42f3054e82a
Agent State: authorized
TS enable: True
Transport: Transport Off
Locale: en_US.UTF-8
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char) : 1

```

```

sizeof(int)      : 4
sizeof(long)    : 4
sizeof(char *)  : 8
sizeof(time_t)  : 4
sizeof(size_t)  : 8
Endian: Big
Write Erase Occurred: False
XOS version: 0.12.0.0
Config Persist Received: False
Message Version: 1.3
connect_info.name: <empty>
connect_info.version: <empty>
connect_info.additional: <empty>
connect_info.prod: False
connect_info.capabilities: <empty>
agent.capabilities: UTILITY, DLC, AppHA, MULTITIER, EXPORT_2, OK_TRY_AGAIN, POLICY_USAGE
Check Point Interface: True
Config Management Interface: False
License Map Interface: True
HA Interface: True
Trusted Store Interface: True
Platform Data Interface: True
Crypto Version 2 Interface: False
SAPuginMgmtInterfaceMutex: True
SAPuginMgmtIPDomainName: True
SmartAgentClientWaitForServer: 2000
SmartAgentCmReTrySend: True
SmartAgentClientIsUnified: True
SmartAgentCmClient: True
SmartAgentClientName: UnifiedClient
builtInEncryption: True
enableOnInit: True
routingReadyByEvent: True
systemInitByEvent: True
SmartTransportServerIdCheck: False
SmartTransportProxySupport: False
SmartAgentMaxRunMemory: 50
SmartAgentConcurrentThreadMax: 10
SmartAgentPolicyControllerModel: False
SmartAgentPolicyModel: True
SmartAgentFederalLicense: True
SmartAgentMultiTenant: False
attr365DayEvalSyslog: True
checkPointWriteOnly: False
SmartAgentDelayCertValidation: False
enableByDefault: False
conversionAutomatic: False
conversionAllowed: False
storageEncryptDisable: False
storageLoadUnencryptedDisable: False
TSPluginDisable: False
bypassUDICheck: False
loggingAddTStamp: False
loggingAddTid: True
HighAvailabilityOverrideEvent: UnknownPlatformEvent
platformIndependentOverrideEvent: UnknownPlatformEvent
platformOverrideEvent: SmartAgentSystemDataListChanged
WaitForHaRole: False
standbyIsHot: True
chkPtType: 2
delayCommInit: False
roleByEvent: True
maxTraceLength: 150
traceAlwaysOn: True

```

```
debugFlags: 0
Event log max size: 5120 KB
Event log current size: 109 KB
P:C9500-16X,S:FCW2233A5ZV: No Trust Data
P:C9500-16X,S:FCW2233A5ZY: No Trust Data
Overall Trust: No ID
```

Platform Provided Mapping Table

=====

C9500-16X: Total licenses found: 143

Enforced Licenses:

E:C9500-16X,S:FCW2233A5ZV:

No PD enforced licenses

E:C9500-16X,S:FCW2233A5ZY:

No PD enforced licenses

# show license udi

To display Unique Device Identifier (UDI) information for a product instance, enter the **show license udi** command in Privileged EXEC mode. In a High Availability set-up, the output displays UDI information for all connected product instances.

## show license udi

### Syntax Description

This command has no arguments or keywords.

### Command Default

Privileged EXEC (#)

### Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.  |
| Cisco IOS XE Amsterdam 17.3.2a | The command continues to be available and applicable in the Smart Licensing Using Policy environment. |

### Usage Guidelines

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

### Examples

[show licensing udi for Smart Licensing Using Policy, on page 140](#)

[show license udi for Smart Licensing, on page 140](#)

#### show licensing udi for Smart Licensing Using Policy

The following is sample output of the **show license udi** command for a High Availability set-up on a Catalyst 9500 switch. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches.

```
Device# show license udi

UDI: PID:C9500-16X,SN:FCW2233A5ZV
HA UDI List:
Active:PID:C9500-16X,SN:FCW2233A5ZV
Standby:PID:C9500-16X,SN:FCW2233A5ZY
```

#### show license udi for Smart Licensing

The following is sample output of the **show license udi** command:

```
Device# show license udi
UDI: PID:C9500-48Y4C,SN:CAT2150L5HK
```

# show license usage

To display license usage information such as status, a count of licenses being used, and enforcement type, enter the **show license usage** command in privileged EXEC mode.

## show license usage

This command has no arguments or keywords.

### Command Default

Privileged EXEC (#)

### Command History

| Release                        | Modification   |
|--------------------------------|--|
| Cisco IOS XE Fuji 16.9.1       | This command was introduced.   |
| Cisco IOS XE Amsterdam 17.3.2a | Command output was updated to reflect new fields that are applicable to Smart Licensing Using Policy. This includes the <code>Status</code> , <code>Enforcement type</code> fields.<br><br>Command output was also updated to remove reservation related information, authorization status information, and export status information. |

### Usage Guidelines

**Smart Licensing Using Policy:** If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

**Smart Licensing:** If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

### Examples

See [Table 9: show license usage Field Descriptions for Smart Licensing Using Policy, on page 141](#) for information about fields shown in the display.

[show license usage for Smart Licensing Using Policy, on page 142](#)

[show license usage for Smart Licensing, on page 143](#)

**Table 9: show license usage Field Descriptions for Smart Licensing Using Policy**

| Field                             | Description  |
|-----------------------------------|--|
| License Authorization:<br>Status: | Displays overall authorization status.   |
| ():                               | Name of the license as in CSSM.<br><br>If this license is one that requires an authorization code, the name of the code. |
| Description                       | Description of the license as in CSSM.   |

| Field                    | Description   |
|--------------------------|---|
| Count                    | License count. If the license is not in-use, the count is reflected as zero.  |
| Version                  | Version.  |
| Status                   | License status can be one of the following <ul style="list-style-type: none"> <li>• In-Use: Valid license, and in-use.</li> <li>• Not In-Use</li> <li>• Not Authorized: Means that the license requires installation of SLA more information, see</li> </ul>  |
| Export Status:           | Indicates if this license is export-controlled or not. Accordingly, one of the is displayed: <ul style="list-style-type: none"> <li>• RESTRICTED - ALLOWED</li> <li>• RESTRICTED - NOT ALLOWED</li> <li>• NOT RESTRICTED</li> </ul>   |
| Feature name             | Name of the feature that uses this license.   |
| Feature Description:     | Description of the feature that uses this license.  |
| Utility Subscription id: | ID<br>Not applicable, because the corresponding configuration option is not supported.  |
| Enforcement type         | Enforcement type status for the license. This may be one of the following <ul style="list-style-type: none"> <li>• ENFORCED</li> <li>• NOT ENFORCED</li> <li>• EXPORT RESTRICTED - ALLOWED</li> <li>• EXPORT RESTRICTED - NOT ALLOWED</li> </ul> For more information about enforcement types, see <a href="#">link tbd</a> |

### show license usage for Smart Licensing Using Policy

The following is sample output of the **show license usage** command on a Cisco Catalyst 9500 switch. Unenforced licenses are in-use here. Similar output is displayed on all supported Cisco Catalyst Access, Core, and Aggregation Switches.

```
Device# show license usage
License Authorization:
  Status: Not Applicable
network-advantage (C9500 Network Advantage):
  Description: network-advantage
  Count: 2
  Version: 1.0
  Status: IN USE
```

```

Export status: NOT RESTRICTED
Feature Name: network-advantage
Feature Description: network-advantage
Enforcement type: NOT ENFORCED
License type: Perpetual
dna-advantage (C9500-16X DNA Advantage):
  Description: C9500-16X DNA Advantage
  Count: 2
  Version: 1.0
  Status: IN USE
Export status: NOT RESTRICTED
Feature Name: dna-advantage
Feature Description: C9500-16X DNA Advantage
Enforcement type: NOT ENFORCED
License type: Subscription

```

### show license usage for Smart Licensing

This example shows a sample output from the **show license usage** command:

```

Device# show license usage
License Authorization:
  Status: AUTHORIZED on Jul 31 17:30:02 2018 IST

C9500 48Y4C DNA Advantage (C9500-DNA-48Y4C-A):
  Description: C9500 48Y4C DNA Advantage
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

C9500 48Y4C NW Advantage (C9500-48Y4C-A):
  Description: C9500 48Y4C NW Advantage
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

```

#### Related Commands

| Command                          | Description                              |
|----------------------------------|--|
| <b>show license all</b>          | Displays entitlements information.       |
| <b>show license status</b>       | Displays compliance status of a license. |
| <b>show license summary</b>      | Displays summary of all active licenses. |
| <b>show license udi</b>          | Displays UDI.                            |
| <b>show tech-support license</b> | Displays the debug output.               |

## show mac address-table

To display the MAC address table, use the **show mac address-table** command in privileged EXEC mode.

```
show mac address-table [{ address mac-addr [ interface type/number | vlan vlan-id ] | aging-time
[ routed-mac | vlan vlan-id ] | control-packet-learn | count [ summary | vlan vlan-id ] |[ dynamic
| secure | static ] [ address mac-addr ] [ interface type/number | vlan vlan-id ] | interface type/number
| learning [ vlan vlan-id ] | multicast [ count ] [ igmp-snooping | mld-snooping | user ] [ vlan
vlan-id ] | notification { change [ interface [ type/number ] ] | mac-move | threshold } | vlan
vlan-id }
```

| Syntax Description   |  |  |
|--|--|--|
| <b>address</b> <i>mac-addr</i>                                       | (Optional) Displays information about the MAC address table for a specific MAC address.              |  |
| <b>interface</b> <i>type/number</i>                                  | (Optional) Displays addresses for a specific interface.  |  |
| <b>vlan</b> <i>vlan-id</i>   | (Optional) Displays addresses for a specific VLAN.   |  |
| <b>aging-time</b> [ <b>routed-mac</b>   <b>vlan</b> <i>vlan-id</i> ] | (Optional) Displays the aging time for the routed MAC or VLAN.                                       |  |
| <b>control-packet-learn</b>  | (Optional) Displays the controlled packet MAC learning parameters.                                   |  |
| <b>count</b>   | (Optional) Displays the number of entries that are currently in the MAC address table.               |  |
| <b>dynamic</b>   | (Optional) Displays only the dynamic addresses.  |  |
| <b>secure</b>  | (Optional) Displays only the secure addresses.   |  |
| <b>static</b>  | (Optional) Displays only the static addresses.   |  |
| <b>learning</b>  | (Optional) Displays learnings of a VLAN or interface.  |  |
| <b>multicast</b>   | (Optional) Displays information about the multicast MAC address table entries only.                  |  |
| <b>igmp-snooping</b>   | (Optional) Displays the addresses learned by Internet Group Management Protocol (IGMP) snooping.     |  |
| <b>mld-snooping</b>  | (Optional) Displays the addresses learned by Multicast Listener Discover version 2 (MLDv2) snooping. |  |
| <b>user</b>  | (Optional) Displays the manually entered (static) addresses.   |  |
| <b>notification change</b>   | Displays the MAC notification parameters and history table.  |  |
| <b>notification mac-move</b>   | Displays the MAC-move notification status.   |  |
| <b>notification threshold</b>  | Displays the Counter-Addressable Memory (CAM) table utilization notification status.                 |  |



**Command Modes** Privileged EXEC (#)

| Command History | Release                        | Modification  |
|-----------------|--------------------------------|---|
|                 | Cisco IOS XE Everest 16.5.1a   | This command was introduced.  |
|                 | Cisco IOS XE Gibraltar 16.12.4 | The output of the <b>show mac address-table vlan <i>vlan-id</i></b> command has been updated to show the MAC addresses used for Cisco Software-Defined Access (SD-Access) solution. |

**Usage Guidelines** The *mac-addr* value is a 48-bit MAC address. The valid format is H.H.H.

The interface *number* argument designates the module and port number. Valid values depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

The following is sample output from the **show mac address-table** command:

```
Device# show mac address-table
```

```

Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
All     0100.0ccc.cccc   STATIC  CPU
All     0100.0ccc.cccd   STATIC  CPU
All     0180.c200.0000   STATIC  CPU
All     0180.c200.0001   STATIC  CPU
All     0180.c200.0002   STATIC  CPU
All     0180.c200.0003   STATIC  CPU
All     0180.c200.0004   STATIC  CPU
All     0180.c200.0005   STATIC  CPU
All     0180.c200.0006   STATIC  CPU
All     0180.c200.0007   STATIC  CPU
All     0180.c200.0008   STATIC  CPU
All     0180.c200.0009   STATIC  CPU
All     0180.c200.000a   STATIC  CPU
All     0180.c200.000b   STATIC  CPU
All     0180.c200.000c   STATIC  CPU
All     0180.c200.000d   STATIC  CPU
All     0180.c200.000e   STATIC  CPU
All     0180.c200.000f   STATIC  CPU
All     0180.c200.0010   STATIC  CPU
All     0180.c200.0021   STATIC  CPU
All     ffff.ffff.ffff   STATIC  CPU
  1     780c.f0e1.1dc3   STATIC  V11
  51    0000.1111.2222   STATIC  V151
  51    780c.f0e1.1dc6   STATIC  V151
1021    0000.0c9f.f45c   STATIC  V11021
1021    0002.02cc.0002   STATIC  Gi6/0/2
1021    0002.02cc.0003   STATIC  Gi6/0/3
1021    0002.02cc.0004   STATIC  Gi6/0/4
1021    0002.02cc.0005   STATIC  Gi6/0/5
1021    0002.02cc.0006   STATIC  Gi6/0/6
1021    0002.02cc.0007   STATIC  Gi6/0/7
1021    0002.02cc.0008   STATIC  Gi6/0/8
1021    0002.02cc.0009   STATIC  Gi6/0/9
1021    0002.02cc.000a   STATIC  Gi6/0/10

```

<output truncated>

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

```
Device# show mac address-table address fc58.9a02.7382
```

```

          Mac Address Table
-----
Vlan    Mac Address      Type      Ports
----    -
1       fc58.9a02.7382   DYNAMIC   Tel/0/1
Total Mac Addresses for this criterion: 1

```

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

```
Device# show mac address-table aging-time vlan 1
```

```

Global Aging Time: 300
Vlan    Aging Time
----    -
1       300

```

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

```
Device# show mac address-table interface TenGigabitEthernet1/0/1
```

```

          Mac Address Table
-----
Vlan    Mac Address      Type      Ports
----    -
1       fc58.9a02.7382   DYNAMIC   Tel/0/1
Total Mac Addresses for this criterion: 1

```

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

```
Device# show mac address-table notification mac-move
```

```
MAC Move Notification: Enabled
```

The following example shows how to display the CAM-table utilization-notification status:

```
Device# show mac address-table notification threshold
```

```

          Status      limit      Interval
-----+-----+-----
enabled             50          120

```

The following example shows how to display the MAC notification parameters and history table for a specific interface:

```
Device# show mac address-table notification change interface tenGigabitEthernet1/0/1
```

```

MAC Notification Feature is Disabled on the switch
Interface                                     MAC Added Trap  MAC Removed Trap
-----

```

```
TenGigabitEthernet1/0/1      Disabled      Disabled
```

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



**Note** MAC addresses of the type CP\_LEARN will be displayed only if Cisco SD-Access solution is used.

```
Device# show mac address-table vlan 1021

          Mac Address Table
-----
Vlan      Mac Address      Type      Ports
-----
1021     0000.0c9f.f45c   STATIC    Vl1021
1021     0002.02cc.0002   STATIC    Gi6/0/2
1021     0002.02cc.0003   STATIC    Gi6/0/3
1021     0002.02cc.0004   STATIC    Gi6/0/4
1021     0002.02cc.0005   STATIC    Gi6/0/5
1021     0002.02cc.0006   STATIC    Gi6/0/6
1021     0002.02cc.0007   STATIC    Gi6/0/7
1021     0002.02cc.0008   STATIC    Gi6/0/8
1021     0002.02cc.0009   STATIC    Gi6/0/9
1021     0002.02cc.000a   STATIC    Gi6/0/10
1021     0002.02cc.000b   STATIC    Gi6/0/11
1021     0002.02cc.000c   STATIC    Gi6/0/12
1021     0002.02cc.000d   STATIC    Gi6/0/13
1021     0002.02cc.000e   STATIC    Gi6/0/14
1021     0002.02cc.000f   STATIC    Gi6/0/15
1021     0002.02cc.0010   STATIC    Gi6/0/16
1021     0002.02cc.0011   STATIC    Gi6/0/17
1021     0002.02cc.0012   STATIC    Gi6/0/18
1021     0002.02cc.0013   STATIC    Gi6/0/19
1021     0002.02cc.0014   STATIC    Gi6/0/20

.
.
.

1021     0002.0100.0001   CP_LEARN  Tu0
1021     0002.0100.0002   CP_LEARN  Tu0
1021     0002.0100.0003   CP_LEARN  Tu0
1021     0002.0100.0004   CP_LEARN  Tu0
1021     0002.0100.0005   CP_LEARN  Tu0
1021     0002.0100.0006   CP_LEARN  Tu0
1021     0002.0100.0007   CP_LEARN  Tu0
1021     0002.0100.0008   CP_LEARN  Tu0
1021     0002.0100.0009   CP_LEARN  Tu0
1021     0002.0100.000a   CP_LEARN  Tu0
Total Mac Addresses for this criterion: 114
```

The table below describes the significant fields shown in the **show mac address-table** display.

*Table 10: show mac address-table Field Descriptions*

| Field               | Description                                   |
|---------------------|---|
| VLAN                | VLAN number.                                  |
| Mac Address         | MAC address of the entry.                     |
| Type                | Type of address.                              |
| Ports               | Port type.                                    |
| Total MAC addresses | Total MAC addresses in the MAC address table. |

**Related Commands**

| Command                        | Description   |
|--------------------------------|---|
| <b>clear mac address-table</b> | Deletes dynamic entries from the MAC address table. |

# show mac address-table move update

To display the MAC address-table move update information on the device, use the **show mac address-table move update** command in EXEC mode.

## show mac address-table move update

|                           |  |
|---------------------------|--|
| <b>Syntax Description</b> | This command has no arguments or keywords. |
|---------------------------|--|

|                        |                                |
|------------------------|--------------------------------|
| <b>Command Default</b> | No default behavior or values. |
|------------------------|--------------------------------|

|                      |                              |
|----------------------|------------------------------|
| <b>Command Modes</b> | User EXEC<br>Privileged EXEC |
|----------------------|------------------------------|

|                        |  |
|------------------------|--|
| <b>Command History</b> | <b>Release</b><br>Cisco IOS XE Everest 16.5.1a |
|------------------------|--|

## Example

This example shows the output from the **show mac address-table move update** command:

```
Device# show mac address-table move update

Switch-ID : 010b.4630.1780
Dst mac-address : 0180.c200.0010
Vlans/Macs supported : 1023/8320
Default/Current settings: Rcv Off/On, Xmt Off/On
Max packets per min : Rcv 40, Xmt 60
Rcv packet count : 10
Rcv conforming packet count : 5
Rcv invalid packet count : 0
Rcv packet count this min : 0
Rcv threshold exceed count : 0
Rcv last sequence# this min : 0
Rcv last interface : Po2
Rcv last src-mac-address : 0003.fd6a.8701
Rcv last switch-ID : 0303.fd63.7600
Xmt packet count : 0
Xmt packet count this min : 0
Xmt threshold exceed count : 0
Xmt pak buf unavail cnt : 0
Xmt last interface : None
```

# show parser encrypt file status

To view the private configuration encryption status, use the **show parser encrypt file status** command.

## show parser encrypt file status

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

**Command Default** None

**Command Modes** User EXEC

| Command History | Release                   | Modification                 |
|-----------------|---------------------------|------------------------------|
|                 | Cisco IOS XE Fuji 16.8.1a | This command was introduced. |

## Examples

The following command output indicates that the feature is available and the file is encrypted. The file is in 'cipher text' format.

```
Device> enable
Device# show parser encrypt file status
Feature:           Enabled
File Format:       Cipher text
Encryption Version: ver1
```

## Related Commands

| Command                                  | Description                                    |
|--|--|
| <b>service private-config-encryption</b> | Enables private configuration file encryption. |

# show platform hardware fpga

To display the system field-programmable gate array (FPGA) settings, use the **show platform hardware fpga** command in privileged EXEC mode.

## show platform hardware fpga

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

**Command Default** None

**Command Modes** Privileged EXEC (#)

| Command History | Release                  | Modification                 |
|-----------------|--------------------------|------------------------------|
|                 | Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

## Example

The following is a sample output from the **show platform hardware fpga** command on a Cisco Catalyst 9300 Series switch:

```
Device# show platform hardware fpga

Register Addr          FPGA Reg Description          Value
-----
0x00000000             Board ID                      0x00006053
0x00000004             FPGA Version                  0x00000206
0x00000008             Reset Reg1                    0x00010204
0x0000000c             Reset Reg2                    0x00000000
0x00000028             FRU LED DATA Reg1           0x00001008
0x0000002c             FRU LED DATA Reg2           0x00001008
0x00000030             FRU Control Reg              0x0000c015
0x00000034             Doppler Misc Reg              0x00000311
0x00000010             SBC Enable                    0x0000000f
<snip>
```

The following is a sample output from the **show platform hardware fpga** command on a Cisco Catalyst 9500 Series switch:

```
Device# show platform hardware fpga

Register Addr          FPGA Reg Description          Value
-----
0x00000000             FPGA Version                  0x00000110
0x00000040             FRU Power Cntrl Reg           0x00000112
0x00000020             System Reset Cntrl Reg        0x00000000
0x00000024             Beacon LED Cntrl Reg          0x00000000
0x00000044             1588 Sync Pulse Reg          0x00000000
0x00000048             Mainboard Misc Cntrl Reg      0x0000000a
0x00000038             DopplerD Misc Cntrl Reg       0x000000ff
<snip>
```

# show platform integrity

To display checksum record for the boot stages , use the **show platform integrity** command in privileged EXEC mode.

**show platform integrity** [**sign** [**nonce** <nonce>]]

|                           |                              |                                |
|---------------------------|------------------------------|--------------------------------|
| <b>Syntax Description</b> | <b>sign</b>                  | (Optional) Show signature      |
|                           | <b>nonce</b>                 | (Optional) Enter a nonce value |
| <b>Command Modes</b>      | Privileged EXEC (#)          |                                |
| <b>Command History</b>    | <b>Release</b>               | <b>Modification</b>            |
|                           | This command was introduced. |                                |

## Examples

This example shows how to view the checksum record for boot stages :

```
Device# show platform integrity sign

PCR0: EE47F8644C2887D9BD4DE3E468DD27EB93F4A606006A0B7006E2928C50C7C9AB
PCR8: E7B61EC32AFA43DA1FF4D77F108CA266848B32924834F5E41A9F6893A9CB7A38
Signature version: 1
Signature:
816C5A29741BBAC1961C109FFC36DA5459A44DBF211025F539AFB4868EF91834C05789
5DAFBC7474F301916B7D0D08ABE5E05E66598426A73E921024C21504383228B6787B74
8526A305B17DAD3CF8705BACFD51A2D55A333415CABC73DAFDEEFD8777AA77F482EC4B
731A09826A41FB3EFFF46DC02FBA666534DBEC7DCC0C029298DB8462A70DBA26833C2A
1472D1F08D721BA941CB94A418E43803699174572A5759445B3564D8EAE57D64AE304
EE1D2A9C53E93E05B24A92387E261199CED8D8A0CE7134596FF8D2D6E6DA773757C70C
D3BA91C43A591268C248DF32658999276FB972153ABE823F0ACFE9F3B6F0AD1A00E257
4A4CC41C954015A59FB8FE
Platform: WS-C3650-12X48UZ
```



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

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

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

**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:

## show platform software audit

```
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="sdal" 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 cause

To display information about why the packets received on an interface are punted to the Router Processor (RP), use the **show platform software fed switch punt cpuq cause** command in privileged EXEC mode.

```
show platform software fed switch {switch-number | active | standby} punt {cause_id | clear | summary}
```

## 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.

*cause\_id*

Specifies the ID of the cause for which the details have to be displayed.

**clear**

Clears the statistics for all the causes. Clearing the causes might result in inconsistent statistics.

**summary**

Displays a high-level overview of the punt reason.

## Command Default

None

## Command Modes

Privileged EXEC (#)

## Command History

**Release**

**Modification**

Cisco IOS XE Gibraltar 16.10.1 This command was introduced.

## Usage Guidelines

None

## Example

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

```
Device# show platform software fed switch active punt cause summary
Statistics for all causes
```

| Cause | Cause Info                    | Rcvd   | Dropped |
|-------|-------------------------------|--------|---------|
| 7     | ARP request or response       | 1      | 0       |
| 21    | RP<->QFP keepalive            | 22314  | 0       |
| 55    | For-us control                | 12     | 0       |
| 60    | IP subnet or broadcast packet | 21     | 0       |
| 96    | Layer2 control protocols      | 133808 | 0       |

-----  
The following is sample output from the **show platform software fed switch active punt cause cause-id** command.

```
Device# show platform software fed switch active punt cause 21  
Detailed Statistics
```

| Sub Cause | Rcvd  | Dropped |
|-----------|-------|---------|
| 0         | 22363 | 0       |

# show platform software fed switch punt cpuq

To display information about the punt traffic on CPU queues, use the **show platform software fed switch punt cpuq** command in privileged EXEC mode.

```
show platform software fed switch {switch-number | active | standby} punt cpuq {cpuq_id | all | brief | clear | rates}
```

|                           |   |  |
|---------------------------|---|--|
| <b>Syntax Description</b> | <b>switch</b> { <i>switch-number</i> <b>active</b> <b>standby</b> } | Displays information about the switch. You have the following options: <ul style="list-style-type: none"> <li>• <i>switch-number</i>.</li> <li>• <b>active</b>—Displays information relating to the active switch.</li> <li>• <b>standby</b>—Displays information relating to the standby switch, if available.</li> </ul> <p><b>Note</b> This keyword is not supported.</p> |
|                           | <b>punt</b>   | Displays the punt information.   |
|                           | <b>cpuq</b>   | Displays information about the CPU receive queue.  |
|                           | <i>cpuq_id</i>  | Specifies details specific to a particular CPU queue.  |
|                           | <b>all</b>  | Displays the statistics for all the CPU queues.  |
|                           | <b>brief</b>  | Displays summarized statistics for all the queues like details about punt packets received and dropped.  |
|                           | <b>clear</b>  | Clears the statistics for all the CPU queues. Clearing the CPU queue might result in inconsistent statistics.  |
|                           | <b>rates</b>  | Displays the rate at which the packets are punted.   |
| <b>Command Default</b>    | None  |  |
| <b>Command Modes</b>      | Privileged EXEC (#)   |  |
| <b>Command History</b>    | <b>Release</b>  | <b>Modification</b>  |
|                           | Cisco IOS XE Gibraltar 16.10.1                                      | This command was introduced.   |
| <b>Usage Guidelines</b>   | None  |  |

**Example**

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

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

```
Punt CPU Q Statistics Brief
```

```
=====
```

| Q no | Queue Name                      | Rx prev | Rx cur | Rx delta | Drop prev | Drop cur | Drop delta |
|------|---------------------------------|---------|--------|----------|-----------|----------|------------|
| 0    | CPU_Q_DOT1X_AUTH                | 0       | 0      | 0        | 0         | 0        | 0          |
| 1    | CPU_Q_L2_CONTROL                | 0       | 6772   | 6772     | 0         | 0        | 0          |
| 2    | CPU_Q_FORUS_TRAFFIC             | 0       | 0      | 0        | 0         | 0        | 0          |
| 3    | CPU_Q_ICMP_GEN                  | 0       | 0      | 0        | 0         | 0        | 0          |
| 4    | CPU_Q_ROUTING_CONTROL           | 0       | 12     | 12       | 0         | 0        | 0          |
| 5    | CPU_Q_FORUS_ADDR_RESOLUTION     | 0       | 1      | 1        | 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       | 21     | 21       | 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       | 127300 | 127300   | 0         | 0        | 0          |
| 16   | CPU_Q_PROTO_SNOOPING            | 0       | 0      | 0        | 0         | 0        | 0          |
| 17   | CPU_Q_BFD_LOW_LATENCY           | 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 11: show platform software fed switch active punt cpuq brief Field Descriptions**

| Field      | Description                 |
|------------|-----------------------------|
| Q no       | ID of the queue.            |
| Queue Name | Name of the queue.          |
| Rx         | Number of packets received. |



| Field | Description                |
|-------|----------------------------|
| Drop  | Number of packets dropped. |

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

```
Device#show platform software fed switch active punt cpuq 1
```

```
Punt CPU Q Statistics
=====
CPU Q Id                : 1
CPU Q Name              : CPU_Q_L2_CONTROL
Packets received from ASIC : 6774
Send to IOSd total attempts : 6774
Send to IOSd failed count  : 0
RX suspend count        : 0
RX unsuspend count      : 0
RX unsuspend send count  : 0
RX unsuspend send failed count : 0
RX consumed count       : 0
RX dropped count        : 0
RX non-active dropped count : 0
RX conversion failure dropped : 0
RX INTACK count         : 6761
RX packets dq'd after intack : 0
Active RxQ event        : 6761
RX spurious interrupt   : 0

Replenish Stats for all rxq:
-----
Number of replenish      : 61969
Number of replenish suspend : 0
Number of replenish un-suspend : 0
-----
```

# show platform software sl-infra

To display troubleshooting information and for debugging, enter the **show platform software sl-infra** command in privileged EXEC mode. The output of this command is used by the technical support team, for troubleshooting and debugging.

**show platform software sl-infra** { **all** | **current** | **debug** | **stored** }

| Syntax Description |  |
|--------------------|--|
| <b>all</b>         | Displays current, debugging, and stored information.         |
| <b>current</b>     | Displays current license-related information.                |
| <b>debug</b>       | Enables debugging  |
| <b>stored</b>      | Displays information that is stored on the product instance. |

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

| Command History | Release                        | Modification                 |
|-----------------|--------------------------------|------------------------------|
|                 | Cisco IOS XE Amsterdam 17.3.2a | This command was introduced. |

**Usage Guidelines** When you encounter an error message that you are not able to resolve, along with a copy of the message that appears on the console or in the system log, provide your Cisco technical support representative with sample output of these commands: **show license tech support**, **show license history message**, and the **show platform software sl-infra all** privileged EXEC commands.

# show platform sudi certificate

To display checksum record for the specific SUDI, use the **show platform sudi certificate** command in privileged EXEC mode.

**show platform sudi certificate** [**sign** [**nonce** <nonce>]]

| <b>Syntax Description</b> | <b>sign</b> (Optional) Show signature  |         |              |  |                              |
|---------------------------|--|---------|--------------|--|------------------------------|
|                           | <b>nonce</b> (Optional) Enter a nonce value  |         |              |  |                              |
| <b>Command Modes</b>      | Privileged EXEC (#)  |         |              |  |                              |
| <b>Command History</b>    | <table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table> | Release | Modification |  | This command was introduced. |
| Release                   | Modification   |         |              |  |                              |
|                           | This command was introduced.   |         |              |  |                              |

## Examples

This example shows how to view the checksum record for a specific SUDI :

```
Device# show platform sudi certificate

-----BEGIN CERTIFICATE-----
MIIDQzCCAiugAwIBAgIQX/h7KctU3I1CoxW1aMmt/zANBgkqhkiG9w0BAQUFADA1
MRYwFAYDVQQKEw1DaXNjbyBTeXN0ZW1zMRswGQYDVQQDEsJDaXNjbyBSb290IENB
IDwNDgVHhcNMDQwNTE0MjAxNzEyWhcNMjkwNTE0MjAyNTQyWjAlMRYwFAYDVQQK
Ew1DaXNjbyBTeXN0ZW1zMRswGQYDVQQDEsJDaXNjbyBSb290IENBIDwNDgVHhcN
MA0GCSqGSIb3DQEBAQUAA4IBDQAwggEIAoIBAQCwmmrmp68Kd6ficha0ZmKUEIhH
xmJVhEAYv8CrLqUccda8bnuoqrpu0hWISEWdovyD0My5jOAmAHBKeN8hF570YQXJ
FcjPftolYYmUQ6iEqDGYeJu5Tm8sUxJsZr2tKyS7McQr/4NEb7Y9JHcJ6r8qqB9q
VvYgDxFU14F1pyXOWWqCZe+36ufijXWLBvLdT6ZeYpzPEApk0E5tzivMW/VgpSdH
jWn0f84bcN5wGyDWbs2mAag8EtKpP6BrXruOIIt6ke01a06g58QBdKhTCytKmg9l
Eg6CTy5j/e/rmxrbU6YTYK/CdfHbBcl1HP7R2RQgYcUTOG/rksc35LtLgXfAgED
o1EwTzALBgNVHQ8EBAMCAyYwDwYDVR0TAQH/BAUwAwEB/zAdBgNVHQ4EFgQUUJ/PI
FR5umgIJFq0roIlgX9p7L6owEAYJKwYBBAGCNxUBBAMCAQAwDQYJKoZIhvcNAQEF
BQADggEBAJ2dhISjQa18dwy3U8pORFbi71R803UXHOjgXkhLtv5MOhmBvrbW7hmW
Yqpao2TB9k5UM8Z3/sUcuVdJcr18JOagxEu5sv4dEX+5wW4q+ffY0vhN4TauYuX
cB7w4ovXsNgOnbFpliqRe61JT37mjpXYgyc81WhJdtSd9i7rp77rMKSsH0T8lasz
Bvt9YAretIpjsJyp8qS5UwGH0GikJ3+r/+n6yUA4iGe00caEb1fJU9u6ju7AQ7L4
CYNu/2bPPu8Xs1gYJQk0XuPL1hS27PKSb3TkL4Eq1ZKR4OCXPDJoBYVL0fdX41Id
kxpUnwVwvEpxYB5DC2Ae/qPOgRnhCzU=
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIEPDCCAYsGAWIBAgIKYQ1ufQAAAAADDANBgkqhkiG9w0BAQUFADA1MRYwFAYD
VQQKEw1DaXNjbyBTeXN0ZW1zMRswGQYDVQQDEsJDaXNjbyBSb290IENBIDwNDgV
HhcNMTEwNjMwMTc1NjU3WhcNMjkwNTE0MjAyNTQyWjAnMQ4wDAYDVQQKEwVDaXNj
bzEVMBMGA1UEAxMMQUNUMiBTvURJIENBMTIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8A
MIIBCgKCAQEAOm5l3THIx9tN/hS5qR/6UZRpdd+9aE2JbFknjht6gfHKd477AkS
5XAtUs5oxDYvt/zEbs1Zq3+LR6qrqKQVU6JYvH05UYLBqCj38s76NLk53905Wzp
9pRcmRCPuX+a6tHF/qRuOiJ44mdeDYzo3qPCpxzprWJDPclM4iYKHUMQMqmgmg+
xghHiooWS80BocdiynEbeP5rZ7qRuewKmpl1TiI3WdBNjZjnpfjg66F+P4SaDkGb
BXdgj13oVeF+EyFWLrFjj97fL2+8oauV43Qrvnf3d/GfQXj7ew+z/sX1XtEOjSXJ
URsyMEj53Rdd9tJwHky8neapszS+r+kdvQIDAQABo4IBWjCCAVYwCwYDVR0PBAQD
AgHGMB0GA1UdDgQWBRI2PHxwnDVW7t8cwmTr7i4MAP4fzAfBgNVHSMEGDAWgBQn
88gVHM6aAgkWrSugiWbf2nsVqjBDBgNVHR8EPDA6MDIqNgA0hjJodHRwOi8vd3d3
LmNpc2NvLmNvbS9zZW50cm10eS9wa2kvY3JsL2NyY2E5MDQ4LmNybDBQBggrBgEF
```

## show platform sudi certificate

```

BQcBAQREMEIwQAYIKwYBBQUHMAKGNgh0dHA6Ly93d3cuY2l2y28uY29tL3N1Y3Vy
aXR5L3BraS9jZXJ0cy9jcmNhMjA0OC5jZXIwXAYDVR0gBFUwUzBRBgorBgEEAQkV
AQwAMEMwQQYIKwYBBQUHAgEWNWh0dHA6Ly93d3cuY2l2y28uY29tL3N1Y3VyaxR5
L3BraS9wb2xpY2llcy9pbmRleC5odG1sMBIGA1UdEwEB/wQIMAYBAf8CAQAwDQYJ
KoZlIhvcNAQEFBQAdggEBAGh1qc1r9tx4hzWgDERm371yeuEmqcIFI9b9+GbMSJbi
ZHc/CcC10lJu0a9zTXA9w47H9/t6leduGxb4WeLxcwCiUgvFtCa51Ik1t8nNbcKY
/4dw1ex+7amATUQO4QggIE67wVlPu6bgAE3Ja/nRS3xKYSnj8H5TehimBSv6TECi
i5jUhOwryAK4dVo8hCkjEkzu3ufBTJapnv89g9OE+H3VKM4L+/KdkUO+52djFKn
hyl47d7cZR4DY4LluFM2PlAs8YyjoNpK/urSRI14WdIlplR1nH7KND15618yfVp
0IFJZBGrooCRBjOSwFv8cpWCbmWdPaCQT2nwIjTfY8c=
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIDhjCCAm6gAwIBAgIDctWkMA0GCSqGSIb3DQEBCwUAMCcxDjAMBGNVBAoTBUNp
c2NvMRUwEwYDVQQDEwxBQ1QyIFNVREkgQ0EwHhcNMTUwODA2MDgwODI5WhcNMjUw
ODA2MDgwODI5WjBzMSwwKgYDVQQFEyNQSUQ6V1MtQzM2NTAtMTJYNDhVWjBTtjPjG
RE8xOTMyWDAAQzEOMAwGA1UEChMFQ2l2y28xGDAWBgNVBAsTD0FDVCOyIExpdGUg
U1VESTZMbcGA1UEAxMQV1MtQzM2NTAtMTJYNDhVWjCCASlWdQYJKoZIhvcNAQEB
BQADggEPADCCAQoCggEBANZxOGYI0eU14HcSwjL4HO75qTj19C2BHG3ufce9ikkN
xwGXi8qg8vKxuB9tRYRaJC5bP1Wmoq7+ZJtQA079xE4X14soNbkq5NaUhh7RB1wD
iRUJvTfCOzVICbnfbzvtB30I75tCarFNmpd0K6AfrIa41U988QGqaCj7R1JrYNaj
n73UXXM/hC0HtNR5mhyqer5Y2qjjzo6tHZYqrrx2eS1XOa262ZSQriAxmah/KLC
K97ywyRbdJ1xBRX3hGtKlog8nASB8WpXqB9NVCERzUajwU3L/kg2BsCqw9Y2m7HW
U1cerTxxgthuyUkdNI+Jg6iGApm2+s8E9hsHPBPMCdIsCAwEAAANvMG0wDgYDVR0P
AQH/BAQDAgXgMAwGA1UdEwEB/wQCMAAwTQYDVR0RBEYwRKBCBgkrBgEEAQkVAgoG
NRMzQ2hpcE1EPVVZSk5ORmRRR1FvN1ZlVmxJRTlqZENBeU9DQXhPRG93TlRveE1T
QVg5eWc9MA0GCSqGSIb3DQEBCwUAA4IBAQBKicTRZbvCRjVIR5MQcWXUT086v6Ej
HahDHTs3YpQoyAVfioNg2x8J6EXcEau4voyVu+eMUoNL4szPhmmDcULfiCGBCA
/R3EFuoVMIzNT0gezIytsCf728KGw1oGuosgVjNGOoahUELu4+F/My7bIJNBH+PD
KjIFmhJpJg0F3q17yClAeXvd13g3W393i35d00Lm5L1WbBfQTyBaOLAbxsHvutrX
u1VZ5sdqSTwTtk09vKMaQjh7a8J/AmJi93jvzM69pe5711P1zqZfyfpiJ3cyJ0xf
I4brQ1smdczloFD4asF7A+1vor5e4VDBP0ppmeFAJvCQ52JTpj0M0o1D
-----END CERTIFICATE-----

```

# show romvar

To view all ROMMON environment variables, use the **show romvar** command. To view environmental variable for a specific resource, use the **show romvar | i resource\_name**.

## show romvar

**Command Default** 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. |

This example shows the output from the **show romvar** command:

```
Device# show romvar
ROMMON variables:
BOARDID="20610"
MODEL_NUM="C9500-40X"
SYSTEM_SERIAL_NUM="FCW2215A1AM"
MOTHERBOARD_SERIAL_NUM="FOC22141LY6"
MOTHERBOARD_REVISION_NUM="B0"
MOTHERBOARD_ASSEMBLY_NUM="73-18140-03"
MODEL_REVISION_NUM="C0"
BAUD="115200"
DC_COPY="yes"
SWITCH_NUMBER="1"
SWITCH_PRIORITY="15"
MAC_ADDR="00:01:02:02:aa:bb"
TAG_ID="E20034120131FB00098B2957"
ENABLE_BREAK="yes"
TEMPLATE="distribution"
TFTP_BLKSIZE="8192"
VERSION_ID="V01"
CRASHINFO="crashinfo:crashinfo_RP_00_00_20180704-001727-UTC"
TFTP_SERVER="10.8.0.6"
BOOT="flash:packages.conf;"
AUTOREBOOT_RESTORE="0"
D_STACK_DAD=""
LICENSE_BOOT_LEVEL="network-essentials+dna-essentials,all:C9500_40X;"
MANUAL_BOOT="yes"
RET_2_RTS=""
ABNORMAL_RESET_COUNT="1"
IP_ADDRESS="10.8.40.173"
IP_SUBNET_MASK="255.255.0.0"
DEFAULT_GATEWAY="10.8.0.1"
ROMMON_AUTOBOOT_ATTEMPT="3"
BSI="0"
RET_2_RCALTS=""
RANDOM_NUM="1494148250"
```

## show running-config

To display the contents of the current running configuration file or the configuration for a specific module, Layer 2 VLAN, class map, interface, map class, policy map, or virtual circuit (VC) class, use the **show running-config** command in privileged EXEC mode.

**show running-config** [*options*]

---

### Syntax Description

*options* (Optional) Keywords used to customize output. You can enter more than one keyword.

- **aaa** [**accounting** | **attribute** | **authentication** | **authorization** | **diameter** | **group** | **ldap** | **miscellaneous** | **radius-server** | **server** | **tacacs-server** | **user-name** | **username**]: Displays AAA configurations.
  - **all**: Expands the output to include the commands that are configured with default parameters. If the **all** keyword is not used, the output does not display commands configured with default parameters.
  - **bridge-domain** {**id** | **parameterized vlan**}: Displays the running configuration for bridge domains.
  - **brief**: Displays the configuration without certification data and encrypted filter details.
  - **class-map** [*name*] [**linenum**]: Displays class map information.
  - **cts** [**interface** | **policy-server** | **rbm-rbac** | **server** | **sxp**]: Displays Cisco TrustSec configurations.
  - **deprecated**: Displays deprecated configuration along with the running configuration.
  - **eap** {**method** | **profiles**}: Displays EAP method configurations and profiles.
  - **flow** {**exporter** | **monitor** | **record**}: Displays global flow configuration commands.
  - **full**: Displays the full configuration.
  - **identity** {**policy** | **profile**}: Displays identity profile or policy information.
-

- **interface** *type number*: Displays interface-specific configuration information. If you use the **interface** keyword, you must specify the interface type and the interface number (for example, **interface GigabitEthernet 1/0/1**). Use the **show run interface ?** command to determine the interfaces available on your system.
- **ip dhcp pool** [*name*]: Displays IPv4 DHCP pool configuration.
- **ipv6 dhcp pool** [*name*]: Displays IPv6 DHCP pool configuration.
- **linenum** [**brief** | **full** | **partition**]: Displays line numbers in the output.
- **map-class** [**atm** | **dialer** | **frame-relay**] [*name*]: Displays map class information.
- **mdns-sd** [**gateway** | **location-group** | **service-definition** | **service-list** | **service-peer** | **service-policy**]: Displays Multicast DNS Service Discovery (mDNS-SD) configurations.
- **partition** {**access-list** | **class-map** | **common** | **global-cdp** | **interface** | **ip-as-path** | **ip-community** | **ip-prefix-list** | **ip-static-routes** | **line** | **policy-map** | **route-map** | **router** | **snmp** | **tacacs**}: Displays the configuration corresponding to a partition.
- **policy-map** [*name*] [**linenum**]: Displays policy map information.
- **switch** *number*: Displays configuration for the specified switch.
- **view** [**full**]: Enables the display of a full running configuration. This is for view-based users who typically can only view the configuration commands that they are entitled to access for that particular view.
- **vlan** [*vlan-id*]: Displays the specific VLAN information; valid values are from 1 to 4094.
- **vrf** [*vrf-name*]: Displays the Virtual routing and forwarding (VRF)-aware configuration module number .

**Command Default**

The default syntax, **show running-config**, displays the contents of the running configuration file, except commands configured using the default parameters.

**Command Modes**

Privileged EXEC (#)

**Command History**

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines**

The **show running-config** command is technically a command alias (substitute or replacement syntax) of the **more system:running-config** command. Although the use of more commands is recommended (because of their uniform structure across platforms and their expandable syntax), the **show running-config** command remains enabled to accommodate its widespread use, and to allow typing shortcuts such as **show run**.

The **show running-config interface** command is useful when there are multiple interfaces and you want to look at the configuration of a specific interface.

The **linenum** keyword causes line numbers to be displayed in the output. This option is useful for identifying a particular portion of a very large configuration.

You can enter additional output modifiers in the command syntax by including a pipe character (|) after the optional keyword. For example, **show running-config interface GigabitEthernet 1/0/1 linenum | begin 3**.

To display the output modifiers that are available for a keyword, enter `| ?` after the keyword. Depending on the platform you are using, the keywords and the arguments for the *options* argument may vary.

The **show running-config all** command displays complete configuration information, including the default settings and values. For example, if the Cisco Discovery Protocol (abbreviated as CDP in the output) hold-time value is set to its default of 180:

- The **show running-config** command does not display this value.
- The **show running-config all** displays the following output: `cdp holdtime 180`.

If the Cisco Discovery Protocol holdtime is changed to a nondefault value (for example, 100), the output of the **show running-config** and **show running-config all** commands is the same; that is, the configured parameter is displayed.

The **show running-config** command displays ACL information. To exclude ACL information from the output, use the **show running | section exclude ip access | access list** command.

## Examples

The following example shows the configuration for GigabitEthernet0/0 interface. The fields are self-explanatory.

```
Device# show running-config interface gigabitEthernet0/0

Building configuration...

Current configuration : 130 bytes
!
interface GigabitEthernet0/0
 vrf forwarding Mgmt-vrf
 ip address 10.5.20.10 255.255.0.0
 negotiation auto
 ntp broadcast
end
```

The following example shows how to set line numbers in the command output and then use the output modifier to start the display at line 10. The fields are self-explanatory.

```
Device# show running-config linenum | begin 10

10 : boot-start-marker
11 : boot-end-marker
12 : !
13 : no logging buffered
14 : enable password #####
15 : !
16 : spe 1/0 1/7
17 :  firmware location bootflash:mica-modem-pw.10.16.0.0.bin
18 : !
19 : !
20 : resource-pool disable
21 : !
22 : no aaa new-model
23 : ip subnet-zero
24 : ip domain name cisco.com
25 : ip name-server 172.16.11.48
26 : ip name-server 172.16.2.133
27 : !
28 : !
29 : isdn switch-type primary-5ess
30 : !
.
```



```
.
.
126 : end
```

In the following sample output from the **show running-config** command, the **shape average** command indicates that the traffic shaping overhead accounting for ATM is enabled. The BRAS-DSLAM encapsulation type is qinq and the subscriber line encapsulation type is snap-rbe based on the ATM adaptation layer 5 (AAL5) service. The fields are self-explanatory.

```
Device# show running-config
.
.
.
subscriber policy recording rules limit 64
no mpls traffic-eng auto-bw timers frequency 0
call rsvp-sync
!
controller T1 2/0
framing sf
linecode ami
!
controller T1 2/1
framing sf
linecode ami
!
!
policy-map unit-test
class class-default
shape average percent 10 account qinq aal5 snap-rbe
!
```

The following is sample output from the **show running-config class-map** command. The fields in the display are self-explanatory.

```
Device# show running-config class-map

Building configuration...

Current configuration : 2157 bytes
!
class-map match-any system-cpp-police-ewlc-control
  description EWLC Control
class-map match-any system-cpp-police-topology-control
  description Topology control
class-map match-any system-cpp-police-sw-forward
  description Sw forwarding, L2 LVX data packets, LOGGING, Transit Traffic
class-map match-any system-cpp-default
  description EWLC Data, Inter FED Traffic
class-map match-any system-cpp-police-sys-data
  description Openflow, Exception, EGR Exception, NFL Sampled Data, RPF Failed
class-map match-any system-cpp-police-punt-webauth
  description Punt Webauth
class-map match-any system-cpp-police-l2lvx-control
  description L2 LVX control packets
class-map match-any system-cpp-police-forus
  description Forus Address resolution and Forus traffic
class-map match-any system-cpp-police-multicast-end-station
  description MCAST END STATION
class-map match-any system-cpp-police-high-rate-app
  description High Rate Applications
class-map match-any system-cpp-police-multicast
  description MCAST Data
class-map match-any system-cpp-police-l2-control
  description L2 control
```

```

class-map match-any system-cpp-police-dot1x-auth
  description DOT1X Auth
class-map match-any system-cpp-police-data
  description ICMP redirect, ICMP_GEN and BROADCAST
class-map match-any system-cpp-police-stackwise-virt-control
  description Stackwise Virtual OOB
...

```

The following example shows that the teletype (tty) line 2 is reserved for communicating with the second core:

```

Device# show running

Building configuration...

Current configuration:
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname device
!
enable password lab
!
no ip subnet-zero
!
!
!
interface Ethernet0
 ip address 10.25.213.150 255.255.255.128
 no ip directed-broadcast
 no logging event link-status
!
interface Serial0
 no ip address
 no ip directed-broadcast
 no ip mroute-cache
 shutdown
 no fair-queue
!
interface Serial1
 no ip address
 no ip directed-broadcast
 shutdown
!
ip default-gateway 10.25.213.129
ip classless
ip route 0.0.0.0 0.0.0.0 10.25.213.129
!
!
line con 0
 transport input none
line 1 6
 no exec
 transport input all
line 7
 no exec
 exec-timeout 300 0
 transport input all
line 8 9
 no exec
 transport input all

```

```

line 10
  no exec
  transport input all
  stopbits 1
line 11 12
  no exec
  transport input all
line 13
  no exec
  transport input all
  speed 115200
line 14 16
  no exec
  transport input all
line aux 0
line vty 0 4
  password cisco
  login
!
end

```

**Related Commands**

| <b>Command</b>                            | <b>Description</b>   |
|---|--|
| <b>copy running-config startup-config</b> | Copies the running configuration to the startup configuration. (Command alias for the <b>copy system:running-config nvram:startup-config</b> command.)   |
| <b>show startup-config</b>                | Displays the contents of NVRAM (if present and valid) or displays the configuration file pointed to by the CONFIG_FILE environment variable. (Command alias for the <b>more:nvram startup-config</b> command.) |

# show sdm prefer

To display information about the templates that can be used to maximize system resources for a particular feature, use the **show sdm prefer** command in privileged EXEC mode. To display the current template, use the command without a keyword.

**show sdm prefer** [ **advanced** ]

|                           |   |
|---------------------------|---|
| <b>Syntax Description</b> | <b>advanced</b> (Optional) Displays information on the advanced template. |
|---------------------------|---|

|                        |                                |
|------------------------|--------------------------------|
| <b>Command Default</b> | No default behavior or values. |
|------------------------|--------------------------------|

|                      |                 |
|----------------------|-----------------|
| <b>Command Modes</b> | Privileged EXEC |
|----------------------|-----------------|

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

|                         |  |
|-------------------------|--|
| <b>Usage Guidelines</b> | If you did not reload the device after entering the <b>sdm prefer</b> global configuration command, the <b>show sdm prefer</b> privileged EXEC command displays the template currently in use and not the newly configured template. |
|-------------------------|--|

The numbers displayed for each template represent an approximate maximum number for each feature resource. The actual number might vary, depending on the actual number of other features configured. For example, in the default template if your device had more than 16 routed interfaces (subnet VLANs), the number of possible unicast MAC addresses might be less than 6000.

## Example

The following is sample output from the **show sdm prefer** command:

```
Device# show sdm prefer

Showing SDM Template Info

This is the Advanced template.
Number of VLANs:          4094
Unicast MAC addresses:    32768
Overflow Unicast MAC addresses:  512
IGMP and Multicast groups:  8192
Overflow IGMP and Multicast groups:  512
Directly connected routes:  32768
Indirect routes:          7680
Security Access Control Entries:  3072
QoS Access Control Entries:  3072
Policy Based Routing ACEs:      1024
Netflow ACEs:               1024
Input Microflow policer ACEs:   256
Output Microflow policer ACEs:  256
Flow SPAN ACEs:             256
Tunnels:                    256
```

```
Control Plane Entries:      512
Input Netflow flows:       8192
Output Netflow flows:      16384
SGT/DGT entries:           4096
SGT/DGT Overflow entries:  512
```

These numbers are typical for L2 and IPv4 features.  
Some features such as IPv6, use up double the entry size;  
so only half as many entries can be created.

# show tech-support confidential

To hide confidential information from the **show tech-support** output, use the **show tech-support confidential** command in privileged EXEC mode.

**show tech-support confidential output** *file-name*

|                           |  |   |
|---------------------------|--|---|
| <b>Syntax Description</b> | <b>output</b> <i>file-name</i>   | Specifies the output file where the tech-support data is to be saved. |
| <b>Command Default</b>    | Privileged EXEC (#)  |   |
| <b>Command History</b>    | <b>Release</b>   | <b>Modification</b>   |
|                           | Cisco IOS XE Amsterdam 17.3.1  | This command was introduced.  |
| <b>Usage Guidelines</b>   | <p>The <b>show tech-support confidential</b> command will hide sensitive data like MAC addresses, IP addresses, and passwords. The output will be the same as that of the <b>show tech-support</b> command with all the customer-specific data masked.</p> <p>The output from the <b>show tech-support confidential</b> command is very long. To better manage this output, you can redirect the output to a file in the local writable storage file system or the remote file system by using the <b>show tech-support confidential output</b> <i>location:filename</i> ). Redirecting the output to a file also makes sending the output to your Cisco Technical Assistance Center (TAC) representative easier.</p> <pre>Device# show tech-support confidential output flash:tech_confidential Collecting tech-support without confidential info, it will take few min..</pre> <p>To view the output of the redirected file, use the command <b>more</b> <i>location:filename</i>.</p> |   |

# show tech-support license

To display the debug output, use the **show license tech support** command in privileged EXEC mode.

## show tech-support license

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

**Command Default** Privileged EXEC (#)

| Command History | Release                  | Modification                 |
|-----------------|--------------------------|------------------------------|
|                 | Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

## Example

This example shows a sample output from the **show tech-support license** command:

```
Device# show tech-support license
----- show clock -----
*12:35:48.561 EDT Tue Jul 17 2018
----- show version -----
Cisco IOS XE Software, Version 16.09.01prd7
Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.9.1prd7,
RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Tue 10-Jul-18 08:47 by mcpre

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documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.
!
!
!
```

| Related Commands | Command                    | Description                              |
|------------------|----------------------------|--|
|                  | <b>show license all</b>    | Displays entitlements information.       |
|                  | <b>show license status</b> | Displays compliance status of a license. |

| <b>Command</b>              | <b>Description</b>                       |
|-----------------------------|--|
| <b>show license summary</b> | Displays summary of all active licenses. |
| <b>show license udi</b>     | Displays UDI.                            |
| <b>show license usage</b>   | Displays license usage information       |



# show tech-support monitor

To display the SPAN monitor information, use the **show tech-support monitor** command in privileged EXEC mode.

**show tech-support monitor** [ {**switch** *switch-number* | **active** | **standby**} ]

| Syntax Description |                      |   |
|--------------------|----------------------|---|
|                    | <i>switch-number</i> | Specifies the switch.                         |
|                    | <b>active</b>        | Specifies the active instance of the switch.  |
|                    | <b>standby</b>       | Specifies the standby instance of the switch. |

**Command Default** Privileged EXEC (#)

| Command History | Release                       | Modification                 |
|-----------------|-------------------------------|------------------------------|
|                 | Cisco IOS XE Amsterdam 17.3.1 | This command was introduced. |

**Usage Guidelines** The output from the **show tech-support monitor** command is very long. To better manage this output, you can redirect the output to a file (for example, **show tech-support monitor** [ **switch** *switch-number* | **active** | **standby** ] | **redirect location: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.

To view the output of the redirected file, use the command **more location:filename**.

# show tech-support platform

To display detailed information about a platform for use by technical support, use the **show tech-support platform** command in privileged EXEC mode.

## show tech-support platform

**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** This command is used for platform-specific debugging. The output provides detailed information about a platform, such as CPU usage, Ternary Content Addressable Memory (TCAM) usage, capacity, and memory usage.

The output of the **show tech-support platform** command is very long. To better manage this output, you can redirect the output to an external file (for example, **show tech-support platform | redirect flash:filename**) in the local writable storage file system or remote file system.

The output of the **show tech-support platform** command displays a list commands and their output. These commands may differ based on the platform.

## Examples

The following is sample output from the **show tech-support platform** command:

```
Device# show tech-support platform
.
.
.
----- show platform hardware capacity -----

Load Average
  Slot  Status  1-Min  5-Min 15-Min
1-RP0 Healthy  0.25  0.17  0.12

Memory (kB)
  Slot  Status  Total      Used (Pct)   Free (Pct)  Committed (Pct)
1-RP0 Healthy 3964428 2212476 (56%) 1751952 (44%) 3420472 (86%)

CPU Utilization
  Slot  CPU   User System  Nice  Idle  IRQ  SIRQ  IOwait
1-RP0  0    1.40  0.90  0.00  97.60 0.00  0.10  0.00
      1    2.00  0.20  0.00  97.79 0.00  0.00  0.00
      2    0.20  0.00  0.00  99.80 0.00  0.00  0.00
      3    0.79  0.19  0.00  99.00 0.00  0.00  0.00
      4    5.61  0.50  0.00  93.88 0.00  0.00  0.00
      5    2.90  0.40  0.00  96.70 0.00  0.00  0.00

*: interface is up
```

IHQ: pkts in input hold queue      IQD: pkts dropped from input queue  
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue  
 RXBS: rx rate (bits/sec)            RXPS: rx rate (pkts/sec)  
 TXBS: tx rate (bits/sec)            TXPS: tx rate (pkts/sec)  
 TRTL: throttle count

| Interface             |      |      | IHQ | IQD   | OHQ | OQD | RXBS | RXPS |
|-----------------------|------|------|-----|-------|-----|-----|------|------|
| TXBS                  | TXPS | TRTL |     |       |     |     |      |      |
| Vlan1                 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| * GigabitEthernet0/0  |      |      | 0   | 10179 | 0   | 0   | 2000 | 4    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/1  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/2  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/3  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/4  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/5  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/6  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/7  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/8  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/9  |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/10 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/11 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/12 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/13 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/14 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/15 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/16 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/17 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/18 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/19 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/20 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/21 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/22 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/23 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/24 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |
| GigabitEthernet1/0/25 |      |      | 0   | 0     | 0   | 0   | 0    | 0    |
| 0                     | 0    | 0    |     |       |     |     |      |      |

## show tech-support platform

```

GigabitEthernet1/0/26      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/27      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/28      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/29      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/30      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/31      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/32      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/33      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/34      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/35      0      0      0      0      0      0
0      0      0
GigabitEthernet1/0/36      0      0      0      0      0      0
0      0      0
Tel/0/37                    0      0      0      0      0      0
0      0      0
Tel/0/38                    0      0      0      0      0      0
0      0      0
Tel/0/39                    0      0      0      0      0      0
0      0      0
Tel/0/40                    0      0      0      0      0      0
0      0      0
Tel/0/41                    0      0      0      0      0      0
0      0      0
Tel/0/42                    0      0      0      0      0      0
0      0      0
Tel/0/43                    0      0      0      0      0      0
0      0      0
Tel/0/44                    0      0      0      0      0      0
0      0      0
Tel/0/45                    0      0      0      0      0      0
0      0      0
Tel/0/46                    0      0      0      0      0      0
0      0      0
Tel/0/47                    0      0      0      0      0      0
0      0      0
Tel/0/48                    0      0      0      0      0      0
0      0      0
Tel/1/1                     0      0      0      0      0      0
0      0      0
Tel/1/2                     0      0      0      0      0      0
0      0      0
Tel/1/3                     0      0      0      0      0      0
0      0      0
Tel/1/4                     0      0      0      0      0      0
0      0      0

```

## ASIC 0 Info

```

-----
ASIC 0 HASH Table 0 Software info: FSE 0
MAB 0: Unicast MAC addresses srip 0 1
MAB 1: Unicast MAC addresses srip 0 1
MAB 2: Unicast MAC addresses srip 0 1
MAB 3: Unicast MAC addresses srip 0 1
MAB 4: Unicast MAC addresses srip 0 1
MAB 5: Unicast MAC addresses srip 0 1
MAB 6: Unicast MAC addresses srip 0 1

```

```

MAB 7: Unicast MAC addresses srip 0 1
ASIC 0 HASH Table 1 Software info: FSE 0
MAB 0: Unicast MAC addresses srip 0 1
MAB 1: Unicast MAC addresses srip 0 1
MAB 2: Unicast MAC addresses srip 0 1
MAB 3: Unicast MAC addresses srip 0 1
MAB 4: Unicast MAC addresses srip 0 1
MAB 5: Unicast MAC addresses srip 0 1
MAB 6: Unicast MAC addresses srip 0 1
MAB 7: Unicast MAC addresses srip 0 1
ASIC 0 HASH Table 2 Software info: FSE 1
MAB 0: L3 Multicast entries srip 2 3
MAB 1: L3 Multicast entries srip 2 3
MAB 2: SGT_DGT          srip 0 1
MAB 3: SGT_DGT          srip 0 1
MAB 4: (null)           srip
MAB 5: (null)           srip
MAB 6: (null)           srip
MAB 7: (null)           srip
.
.
.

```

Output fields are self-explanatory.

#### Related Commands

| Command   | Description  |
|---|--|
| <b>show tech-support platform evpn_vxlan</b>    | Displays EVPN-VXLAN-related platform information.      |
| <b>show tech-support platform fabric</b>        | Displays detailed information about the switch fabric. |
| <b>show tech-support platform igmp_snooping</b> | Displays IGMP snooping information about a group.      |
| <b>show tech-support platform layer3</b>        | Displays Layer 3 platform forwarding information.      |
| <b>show tech-support platform mld_snooping</b>  | Displays MLD snooping information about a group.       |

## show tech-support platform evpn\_vxlan

To display Ethernet VPN (EVPN)-Virtual eXtensible LAN (VXLAN)-related platform information for use by technical support, use the **show tech-support platform evpn\_vxlan** command in privileged EXEC mode.

**show tech-support platform evpn\_vxlan switch** *switch-number*

|                           |                                    |  |
|---------------------------|------------------------------------|--|
| <b>Syntax Description</b> | <b>switch</b> <i>switch-number</i> | Displays information for the specified switch. Valid values are from 1 to 9. |
|---------------------------|------------------------------------|--|

|                      |                     |
|----------------------|---------------------|
| <b>Command Modes</b> | Privileged EXEC (#) |
|----------------------|---------------------|

| <b>Command History</b> | <b>Release</b>                 | <b>Modification</b>          |
|------------------------|--------------------------------|------------------------------|
|                        | Cisco IOS XE Gibraltar 16.10.1 | This command was introduced. |

|                         |   |
|-------------------------|---|
| <b>Usage Guidelines</b> | The output of this command is very long. To better manage this output, you can redirect the output to an external file (for example, <b>show tech-support platform evpn_vxlan switch 1   redirect flash:filename</b> ) in the local writable storage file system or remote file system. |
|-------------------------|---|

### Examples

The following is sample output from the **show tech-support platform evpn\_vxlan** command:

```
Device# show tech-support platform evpn_vxlan switch 1
.
.
.
    "show clock"
    "show version"
    "show running-config"switch no: 1

----- sh sdm prefer -----

Showing SDM Template Info

This is the Advanced template.
Number of VLANs:                               4094
Unicast MAC addresses:                         32768
Overflow Unicast MAC addresses:                512
L2 Multicast entries:                          4096
Overflow L2 Multicast entries:                 512
L3 Multicast entries:                          4096
Overflow L3 Multicast entries:                 512
Directly connected routes:                    16384
Indirect routes:                              7168
STP Instances:                                4096
Security Access Control Entries:               3072
QoS Access Control Entries:                   2560
Policy Based Routing ACEs:                    1024
Netflow ACEs:                                 768
Flow SPAN ACEs:                               512
Tunnels:                                      256
LISP Instance Mapping Entries:                 256
Control Plane Entries:                        512
```

```

Input Netflow flows:                8192
Output Netflow flows:              16384
SGT/DGT (or) MPLS VPN entries:     4096
SGT/DGT (or) MPLS VPN Overflow entries: 512
Wired clients:                    2048
MACSec SPD Entries:                256
MPLS L3 VPN VRF:                  127
MPLS Labels:                       2048
MPLS L3 VPN Routes VRF Mode:      7168
MPLS L3 VPN Routes Prefix Mode:   3072
MVPN MDT Tunnels:                 256
L2 VPN EOMPLS Attachment Circuit: 256
MAX VPLS Bridge Domains :         64
MAX VPLS Peers Per Bridge Domain: 8
MAX VPLS/VPWS Pseudowires :      256

```

These numbers are typical for L2 and IPv4 features.  
Some features such as IPv6, use up double the entry size;  
so only half as many entries can be created.  
\* values can be modified by sdm cli.

```
----- show platform software fed switch 1 ifm interfaces nve -----
```

```
----- show platform software fed switch 1 ifm interfaces efp -----
```

```
----- show platform software fed switch 1 matm macTable -----
```

```

Total Mac number of addresses:: 0
*a_time=aging_time(secs) *e_time=total_elapsed_time(secs)
Type:
MAT_DYNAMIC_ADDR          0x1  MAT_STATIC_ADDR          0x2  MAT_CPU_ADDR
  0x4  MAT_DISCARD_ADDR          0x8
MAT_ALL_VLANS             0x10 MAT_NO_FORWARD           0x20  MAT_IPMULT_ADDR
0x40  MAT_RESYNC                0x80
MAT_DO_NOT_AGE            0x100 MAT_SECURE_ADDR         0x200  MAT_NO_PORT
0x400  MAT_DROP_ADDR            0x800
MAT_DUP_ADDR              0x1000 MAT_NULL_DESTINATION    0x2000  MAT_DOT1X_ADDR
0x4000  MAT_ROUTER_ADDR         0x8000
MAT_WIRELESS_ADDR        0x10000 MAT_SECURE_CFG_ADDR     0x20000  MAT_OPQ_DATA_PRESENT
0x40000  MAT_WIRED_TUNNEL_ADDR  0x80000
MAT_DLR_ADDR              0x100000 MAT_MRP_ADDR            0x200000  MAT_MSRRP_ADDR
0x400000  MAT_LISP_LOCAL_ADDR   0x800000
MAT_LISP_REMOTE_ADDR    0x1000000 MAT_VPLS_ADDR           0x2000000
Device#

```

Output fields are self-explanatory.

#### Related Commands

| Command                           | Description  |
|-----------------------------------|--|
| <b>show tech-support platform</b> | Displays detailed information about a platform for use by technical support. |

# show tech-support platform fabric

To display information about the switch fabric, use the **show tech-support platform fabric** command in privileged EXEC mode.

```
show tech-support platform fabric [{display-cli | vrf vrf-name {ipv4 display-cli | ipv6 display-cli |
source instance-id instance-id {ipv4 ip-address/ip-prefix | ipv6 ipv6-address/ipv6-prefix | mac mac-address}
{dest instance-id instance-id} {ipv4 ip-address/ip-prefix | ipv6 ipv6-address/ipv6-prefix | mac mac-address}
[{display-cli}]]}]
```

| Syntax Description                          |  |  |
|---|--|--|
| <b>display-cli</b>                          |  | (Optional) Displays the list of show commands available in the output of this command.                                   |
| <b>vrf</b> <i>vrf-name</i>                  |  | (Optional) Displays fabric-related information for the specified virtual routing and forwarding (VRF) instance.          |
| <b>ipv4</b> <i>ip-address/ip-prefix</i>     |  | (Optional) Displays fabric-related information for the source or destination IP VRF.                                     |
| <b>ipv6</b> <i>ipv6-address/ipv6-prefix</i> |  | (Optional) Displays fabric-related information for the source or destination IPv6 VRF.                                   |
| <b>source</b>                               |  | (Optional) Displays fabric-related information for the source VRF.   |
| <b>instance-id</b> <i>instance-id</i>       |  | (Optional) Displays information about the endpoint identifier (EID) of the source.                                       |
| <b>mac</b> <i>mac-address</i>               |  | (Optional) Displays fabric-related information for the source and destination MAC VRF for Layer 2 extension deployments. |

**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 an external file (for example, **show tech-support platform fabric | redirect flash:filename**) in the local writable storage file system or remote file system.



The output of this command displays a list commands and their output. These commands may differ based on the platform.

## Examples

The following is sample output from the **show tech-support platform fabric vrf source instance-id ipv4 dest instance-id ipv4** command:

```
Device# show tech-support platform fabric vrf DEFAULT_VN source instance-id
4098 ipv4 10.1.1.1/32 dest instance-id 4098 ipv4 10.12.12.12/32

.
.
.
-----show ip lisp eid-table vrf DEFAULT_VN forwarding eid remote 10.12.12.12-----

Prefix          Fwd action  Locator status bits  encap_iid
10.12.12.12/32  encap      0x00000001          N/A
  packets/bytes 1/576
  path list 7F44EEC2C188, 4 locks, per-destination, flags 0x49 [shble, rif, hwn]
  ifnums:
    LISP0.4098(78): 192.0.2.2
  1 path
    path 7F44F8B5AFF0, share 10/10, type attached nexthop, for IPv4
      nexthop 192.0.2.2 LISP0.4098, IP midchain out of LISP0.4098, addr 192.0.2.2
7F44F8E86CE8
  1 output chain
    chain[0]: IP midchain out of LISP0.4098, addr 192.0.2.2 7F44F8E86CE8
              IP adj out of GigabitEthernet1/0/1, addr 10.0.2.1 7F44F8E87378

-----show lisp instance-id 4098 ipv4 map-cache-----

LISP IPv4 Mapping Cache for EID-table vrf DEFAULT_VN (IID 4098), 3 entries
0.0.0.0/0, uptime: 02:46:01, expires: never, via static-send-map-request
  Encapsulating to proxy ETR
10.1.1.0/24, uptime: 02:46:01, expires: never, via dynamic-EID, send-map-request
  Encapsulating to proxy ETR
10.12.12.12/32, uptime: 02:45:54, expires: 21:14:06, via map-reply, complete
Locator Uptime  State      Pri/Wgt  Encap-IID
192.0.2.2 02:45:54 up        10/10    -

-----show lisp instance-id 4098 ipv4 map-cache detail-----

LISP IPv4 Mapping Cache for EID-table vrf DEFAULT_VN (IID 4098), 3 entries
0.0.0.0/0, uptime: 02:46:01, expires: never, via static-send-map-request
  Sources: static-send-map-request
  State: send-map-request, last modified: 02:46:01, map-source: local
  Exempt, Packets out: 2(676 bytes) (~ 02:45:38 ago)
  Configured as EID address space
  Encapsulating to proxy ETR
10.1.1.0/24, uptime: 02:46:01, expires: never, via dynamic-EID, send-map-request
  Sources: NONE
  State: send-map-request, last modified: 02:46:01, map-source: local
  Exempt, Packets out: 0(0 bytes)
  Configured as EID address space
  Configured as dynamic-EID address space
  Encapsulating dynamic-EID traffic
  Encapsulating to proxy ETR
```

```

10.12.12.12/32, uptime: 02:45:54, expires: 21:14:06, via map-reply, complete
Sources: map-reply
State: complete, last modified: 02:45:54, map-source: 10.0.1.2
Idle, Packets out: 1(576 bytes) (~ 02:45:38 ago)
Locator Uptime State Pri/Wgt Encap-IID
192.0.2.2 02:45:54 up 10/10 -
Last up-down state change: 02:45:54, state change count: 1
Last route reachability change: 02:45:54, state change count: 1
Last priority / weight change: never/never
RLOC-probing loc-status algorithm:
Last RLOC-probe sent: 02:45:54 (rtt 1ms)

```

```
-----show lisp instance-id 4098 ipv4 map-cache 10.12.12.12/32-----
```

```
LISP IPv4 Mapping Cache for EID-table vrf DEFAULT_VN (IID 4098), 3 entries
```

```

10.12.12.12/32, uptime: 02:45:54, expires: 21:14:06, via map-reply, complete
Sources: map-reply
State: complete, last modified: 02:45:54, map-source: 10.0.1.2
Idle, Packets out: 1(576 bytes) (~ 02:45:38 ago)
Locator Uptime State Pri/Wgt Encap-IID
192.0.2.2 02:45:54 up 10/10 -
Last up-down state change: 02:45:54, state change count: 1
Last route reachability change: 02:45:54, state change count: 1
Last priority / weight change: never/never
RLOC-probing loc-status algorithm:
Last RLOC-probe sent: 02:45:54 (rtt 1ms)

```

```
-----show ip cef vrf DEFAULT_VN 10.12.12.12/32 internal-----
```

```

10.12.12.12/32, epoch 1, flags [sc, lisp elig], refcnt 6, per-destination sharing
sources: LISP, IPL
feature space:
  Broker: linked, distributed at 1st priority
subblocks:
  SC owned,sourced: LISP remote EID - locator status bits 0x00000001
  LISP remote EID: 1 packets 576 bytes fwd action encap, cfg as EID space
  LISP source path list
    path list 7F44EEC2C188, 4 locks, per-destination, flags 0x49 [shble, rif, hwc]
    ifnums:
      LISP0.4098(78): 192.0.2.2
    1 path
      path 7F44F8B5AFF0, share 10/10, type attached nexthop, for IPv4
      nexthop 192.0.2.2 LISP0.4098, IP midchain out of LISP0.4098, addr 192.0.2.2
7F44F8E86CE8
    1 output chain
      chain[0]: IP midchain out of LISP0.4098, addr 192.0.2.2 7F44F8E86CE8
      IP adj out of GigabitEthernet1/0/1, addr 10.0.2.1 7F44F8E87378
    Dependent covered prefix type LISP, cover 0.0.0.0/0
    2 IPL sources [no flags]
  ifnums:
    LISP0.4098(78): 192.0.2.2
  path list 7F44EEC2C188, 3 locks, per-destination, flags 0x49 [shble, rif, hwc]
  path 7F44F8B5AFF0, share 10/10, type attached nexthop, for IPv4
  nexthop 192.0.2.2 LISP0.4098, IP midchain out of LISP0.4098, addr 192.0.2.2 7F44F8E86CE8

output chain:
  PushCounter(LISP:10.12.12.12/32) 7F44F3C8B8D8
  IP midchain out of LISP0.4098, addr 192.0.2.2 7F44F8E86CE8
  IP adj out of GigabitEthernet1/0/1, addr 10.0.2.1 7F44F8E87378

```

```

switch no: 1
.
.
.

Device# show tech-support platform fabric vrf Campus_VN source instance-id 8189
mac 00b7.7128.00a1 dest instance-id 8189 mac 00b7.7128.00a0 | i show

----- show clock -----
----- show version -----
----- show running-config -----
----- show device-tracking database -----
----- show lisp site -----
----- show mac address-table address 00B7.7128.00A0-----
----- show ip arp vrf Campus_VN-----
Device#

```

Output fields are self-explanatory.

#### Related Commands

| Command                           | Description  |
|-----------------------------------|--|
| <b>show tech-support platform</b> | Displays detailed information about a platform for use by technical support. |

# show tech-support platform igmp\_snooping

To display Internet Group Management Protocol (IGMP) snooping information about a group, use the **show tech-support platform igmp\_snooping** command in privileged EXEC mode.

```
show tech-support platform igmp_snooping [{Group_ipAddr ipv4-address} [{vlan vlan-ID}]]
```

| Syntax Description | Group_ipAddr               | (Optional) Displays snooping information about the specified group address.          |
|--------------------|----------------------------|--|
|                    | <i>ipv4-address</i>        | (Optional) IPv4 address of the group.  |
|                    | <b>vlan</b> <i>vlan-ID</i> | (Optional) Displays IGMP snooping VLAN information. Valid values are from 1 to 4094. |

**Command Modes** Privileged EXEC (#)

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

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 platform igmp\_snooping | redirect flash:filename**) in the local writable storage file system or remote file system.

## Examples

The following is sample output from the **show tech-support platform igmp\_snooping** command:

```
Device# show tech-support platform igmp_snooping GroupIPAddr 226.6.6.6 vlan
.
.
.
----- show ip igmp snooping groups | i 226.6.6.6 -----
5          226.6.6.6          user          Gi1/0/8, Gi1/0/27, Gi1/0/28,

----- show ip igmp snooping groups count -----
Total number of groups:  2

----- show ip igmp snooping mrouter -----

Vlan      ports
-----  -----
   23     Router
   24     Router
```

25 Router

----- show ip igmp snooping querier -----

| Vlan | IP Address | IGMP Version | Port   |
|------|------------|--------------|--------|
| 23   | 10.1.1.1   | v2           | Router |
| 24   | 10.1.2.1   | v2           | Router |
| 25   | 10.1.3.1   | v2           | Router |

----- show ip igmp snooping vlan 5 -----

Global IGMP Snooping configuration:

```

-----
IGMP snooping           : Enabled
Global PIM Snooping     : Disabled
IGMPv3 snooping         : Enabled
Report suppression      : Enabled
TCN solicit query       : Disabled
TCN flood query count   : 2
Robustness variable     : 2
Last member query count : 2
Last member query interval : 1000

```

Vlan 5:

```

-----
IGMP snooping           : Enabled
Pim Snooping            : Disabled
IGMPv2 immediate leave  : Disabled
Explicit host tracking   : Enabled
Multicast router learning mode : pim-dvmrp
CGMP interoperability mode : IGMP_ONLY
Robustness variable     : 2
Last member query count : 2
Last member query interval : 1000

```

----- show ip igmp snooping groups vlan 5 -----

| Vlan | Group       | Type | Version | Port List   |
|------|-------------|------|---------|---|
| 5    | 226.6.6.6   | user |         | Gi1/0/8, Gi1/0/27, Gi1/0/28,<br>Gi2/0/7, Gi2/0/8, Gi2/0/27,<br>Gi2/0/28 |
| 5    | 238.192.0.1 | user |         | Gi2/0/28  |

----- show platform software fed active ip igmp snooping vlan 5 -----

Vlan 5

```

-----
IGMPSN Enabled : On
PIMSN Enabled  : Off
Flood Mode     : On
I-Mrouter      : Off
Oper State     : Up

```

**show tech-support platform igmp\_snooping**

```

STP TCN Flood   : Off
Routing Enabled : Off
PIM Enabled     : Off
PVLAN          : No
In Retry       : 0x0
L3mcast Adj    :
Mrouter PortQ  :
Flood PortQ    :

```

```

----- show platform software fed active ip igmp snooping groups | begin 226.6.6.6 -----

```

```

Vlan:5 Group:226.6.6.6
-----

```

```

Member ports   :
CAPWAP ports   :
Host Type Flags: 0
Failure Flags  : 0
DI handle      : 0x7f11151cbad8
REP RI handle  : 0x7f11151cc018
SI handle      : 0x7f11151cd198
HTM handle     : 0x7f11151cd518

```

```

si hdl : 0x7f11151cd198 rep ri hdl : 0x7f11151cc018 di hdl : 0x7f11151cbad8 htm hdl :
0x7f11151cd518

```

```

.
.
.

```

```

Device#

```

Output fields are self-explanatory.

**Related Commands**

| Command                           | Description  |
|-----------------------------------|--|
| <b>ip igmp snooping</b>           | Enables IGMP snooping globally or on an interface.                           |
| <b>show ip igmp snooping</b>      | Displays the IGMP snooping configuration of a device.                        |
| <b>show tech-support platform</b> | Displays detailed information about a platform for use by technical support. |

# show tech-support platform layer3

To display Layer 3 platform forwarding information, use the **show tech-support platform layer3** command in privileged EXEC mode.

```
show tech-support platform layer3 {multicast Group_ipAddr ipv4-address switch switch-number srcIP
ipv4-address | unicast {dstIP ipv4-address srcIP ipv4-address | vrf vrf-name destIP ipv4-address srcIP
ipv4-address}}
```

| Syntax Description |   |  |
|--------------------|---|--|
|                    | <b>multicast</b>                          | Displays multicast information.  |
|                    | <b>Group_ipv6Addr</b> <i>ipv4-address</i> | Displays information about the specified multicast group address.              |
|                    | <b>switch</b> <i>switch-number</i>        | Displays information about the specified switch. Valid values are from 1 to 9. |
|                    | <b>srcIP</b> <i>ipv4-address</i>          | Displays information about the specified source address.                       |
|                    | <b>unicast</b>                            | Displays unicast-related information.  |
|                    | <b>dstIP</b> <i>ipv4-address</i>          | Displays information about the specified destination address.                  |
|                    | <b>vrf</b> <i>vrf-name</i>                | Displays unicast-related virtual routing and forwarding (VRF) information.     |

**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 an external file (for example, **show tech-support platform layer3 multicast group 224.1.1.1 switch 1 srcIP 10.10.0.2 | redirect flash:filename**) in the local writable storage file system or remote file system.

## Examples

The following is sample output from the **show tech-support platform layer3 multicast group** command:

```
Device# show tech-support platform layer3 multicast group_ipAddr 224.1.1.1
switch 1 srcIp 10.10.0.2
.
.
.
destination IP: 224.1.1.1
source IP: 10.10.0.2
```

## show tech-support platform layer3

```

switch no: 1

----- show ip mroute 224.1.1.1 10.10.0.2 -----

IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
      L - Local, P - Pruned, R - RP-bit set, F - Register flag,
      T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
      X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
      U - URD, I - Received Source Specific Host Report,
      Z - Multicast Tunnel, z - MDT-data group sender,
      Y - Joined MDT-data group, y - Sending to MDT-data group,
      G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
      N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
      Q - Received BGP S-A Route, q - Sent BGP S-A Route,
      V - RD & Vector, v - Vector, p - PIM Joins on route,
      x - VxLAN group, c - PFP-SA cache created entry
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(10.10.0.2, 224.1.1.1), 00:00:22/00:02:37, flags: LFT
  Incoming interface: GigabitEthernet1/0/10, RPF nbr 0.0.0.0, Registering
  Outgoing interface list:
    Vlan20, Forward/Sparse, 00:00:22/00:02:37, A

----- show ip mfib 224.1.1.1 10.10.0.2 -----

Entry Flags:      C - Directly Connected, S - Signal, IA - Inherit A flag,
                  ET - Data Rate Exceeds Threshold, K - Keepalive
                  DDE - Data Driven Event, HW - Hardware Installed
                  ME - MoFRR ECMP entry, MNE - MoFRR Non-ECMP entry, MP - MFIB
                  MoFRR Primary, RP - MRIB MoFRR Primary, P - MoFRR Primary
                  MS - MoFRR Entry in Sync, MC - MoFRR entry in MoFRR Client.
I/O Item Flags:  IC - Internal Copy, NP - Not platform switched,
                  NS - Negate Signalling, SP - Signal Present,
                  A - Accept, F - Forward, RA - MRIB Accept, RF - MRIB Forward,
                  MA - MFIB Accept, A2 - Accept backup,
                  RA2 - MRIB Accept backup, MA2 - MFIB Accept backup

Forwarding Counts: Pkt Count/Pkts per second/Avg Pkt Size/Kbits per second
Other counts:      Total/RPF failed/Other drops
I/O Item Counts:  FS Pkt Count/PS Pkt Count
Default
(10.10.0.2,224.1.1.1) Flags: HW
  SW Forwarding: 0/0/0/0, Other: 1/1/0
  HW Forwarding:  NA/NA/NA/NA, Other: NA/NA/NA
  GigabitEthernet1/0/10 Flags: A
  Vlan20 Flags: F IC
    Pkts: 0/0
  Tunnel0 Flags: F
    Pkts: 0/0

----- show platform software fed switch 1 ip multicast interface summary -----

Multicast Interface database

```



| VRF | Interface<br>SVI                                  | IF ID              | PIM Status | State              | RI Handle |
|-----|---|--------------------|------------|--------------------|-----------|
| 0   | GigabitEthernet1/0/10<br>0x00007fb414b1f108 false | 0x000000000000005f | enabled    | 0x0000000000000010 |           |
| 0   | Vlan20<br>0x00007fb414b31a98 true                 | 0x0000000000000060 | enabled    | 0x0000000000000010 |           |

----- show platform software fed switch 1 ip multicast groups summary -----

Multicast Groups database

Mvrf\_id: 0 Mroute: (\*, 224.0.1.40/32) Flags: C IC  
Htm: 0x00007fb414b23ce8 Si: 0x00007fb414b23a08 Di: 0x00007fb414b240e8 Rep\_ri:  
0x00007fb414b245f8

Mvrf\_id: 0 Mroute: (\*, 224.0.0.0/4) Flags: C  
Htm: 0x00007fb4143549e8 Si: 0x00007fb414b20a48 Di: 0x00007fb414b1fe78 Rep\_ri:  
0x00007fb414b20428

Mvrf\_id: 0 Mroute: (\*, 224.1.1.1/32) Flags: C IC  
Htm: 0x00007fb414b2cc98 Si: 0x00007fb414b2b678 Di: 0x00007fb414b2ab98 Rep\_ri:  
0x00007fb414b2b0c8

Mvrf\_id: 0 Mroute: (10.10.0.2, 224.1.1.1/32) Flags: IC  
Htm: 0x00007fb414b2f348 Si: 0x00007fb414b321d8 Di: 0x00007fb414b2dba8 Rep\_ri:  
0x00007fb414b30ed8

----- show platform software fed switch 1 ip multicast groups count -----

Total Number of entries:4

----- show platform software fed switch 1 ip multicast groups 224.1.1.1/32  
source 10.10.0.2 detail -----

MROUTE ENTRY vrf 0 (10.10.0.2, 224.1.1.1/32)  
HW Handle: 140411418055080 Flags: IC  
RPF interface: GigabitEthernet1/0/10(95):  
HW Handle:140411418055080 Flags:A  
Number of OIF: 3  
Flags: 0x4 Pkts : 0  
OIF Details:  
Tunnel0 Adj: 0xf8000636 F  
Vlan20 Adj: 0xf8000601 F IC  
GigabitEthernet1/0/10 A  
Htm: 0x7fb414b2f348 Si: 0x7fb414b321d8 Di: 0x7fb414b2dba8 Rep\_ri: 0x7fb414b30ed8

DI details

-----  
Handle:0x7fb414b2dba8 Res-Type:ASIC\_RSC\_DI Res-Switch-Num:255 Asic-Num:255  
Feature-ID:AL\_FID\_L3\_  
MULTICAST\_IPV4 Lkp-ftr-id:LKP\_FEAT\_INVALID ref\_count:1  
priv\_ri/priv\_si Handle:(nil) Hardware Indices/Handles: index0:0x538e  
mtu\_index/l3u\_ri\_index0:0x0 index1:0x538e mtu\_index/l3u\_ri\_index1:0x0

## show tech-support platform layer3

```

Cookie length: 56
00 00 00 00 00 00 00 00 00 00 00 00 00 02 00 0a 0a 01 01 01 e0 00 00 00 00 00 00 00 00 00 00
00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Detailed Resource Information (ASIC# 0)
-----

Destination Index (DI) [0x538e]
portMap = 0x00000000          0
cmil = 0x385
rcpPortMap = 0

al_rsc_cmi
CPU Map Index (CMI) [0x385]
ctiLo0 = 0x9
ctiLo1 = 0
ctiLo2 = 0
cpuQNum0 = 0x9e
cpuQNum1 = 0
cpuQNum2 = 0
npuIndex = 0
strip_seg = 0x0
copy_seg = 0x0
Detailed Resource Information (ASIC# 1)
-----

Destination Index (DI) [0x538e]
portMap = 0x00000000          0
cmil = 0x385
rcpPortMap = 0

al_rsc_cmi
CPU Map Index (CMI) [0x385]
ctiLo0 = 0x9
ctiLo1 = 0
ctiLo2 = 0
cpuQNum0 = 0x9e
cpuQNum1 = 0
cpuQNum2 = 0
npuIndex = 0
strip_seg = 0x0
copy_seg = 0x0

=====

RI details
-----
Handle:0x7fb414b30ed8 Res-Type:ASIC_RSC_RI_REP Res-Switch-Num:255 Asic-Num:255 Feature-ID:
AL_FID_L3_MULTICAST_IPV4 Lkp-ftr-id:LKP_FEAT_INVALID ref_count:1
priv_ri/priv_si Handle:(nil) Hardware Indices/Handles: index0:0x5 mtu_index/13u_ri_index0:0x0
index1:0x5 mtu_index/13u_ri_index1:0x0
Cookie length: 56
00 00 00 00 00 00 00 00 00 00 00 00 00 02 00 0a 0a 01 01 01 e0 00 00 00 00 00 00 00 00 00 00
00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Detailed Resource Information (ASIC# 0)
-----

Detailed Resource Information (ASIC# 1)
-----

=====

```

```

SI details
-----
Handle:0x7fb414b321d8 Res-Type:ASIC_RSC_SI_STATS Res-Switch-Num:255 Asic-Num:255 Feature-ID:
AL_FID_L3_MULTICAST_IPV4 Lkp-ftr-id:LKP_FEAT_INVALID ref_count:1
priv_ri/priv_si Handle:(nil) Hardware Indices/Handles: index0:0x4004 mtu_index/l3u_ri_index0:
0x0 sm handle 0:0x7fb414b2df98 index1:0x4004 mtu_index/l3u_ri_index1:0x0
Cookie length: 56
00 00 00 00 00 00 00 00 00 00 00 00 02 00 0a 0a 01 01 01 e0 00 00 00 00 00 00 00 00 00
00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Detailed Resource Information (ASIC# 0)
-----
Detailed Resource Information (ASIC# 1)
-----

=====

HTM details
-----
Handle:0x7fb414b2f348 Res-Type:ASIC_RSC_HASH_TCAM Res-Switch-Num:0 Asic-Num:255 Feature-ID:
AL_FID_L3_MULTICAST_IPV4 Lkp-ftr-id:LKP_FEAT_IPV4_MCAST_SG ref_count:1
priv_ri/priv_si Handle:(nil) Hardware Indices/Handles: handle0:0x7fb414b2f558
Detailed Resource Information (ASIC# 0)
-----
Number of HTM Entries: 1

Entry #0: (handle 0x7fb414b2f558)

KEY - src_addr:10.10.0.2 starg_station_index: 16387
MASK - src_addr:0.0.0.0 starg_station_index: 0
AD: use_starg_match: 0 mcast_bridge_frame: 0 mcast_rep_frame: 0 rpf_valid: 1 rpf_le_ptr: 0

afd_client_flag: 0 dest_mod_bridge: 0 dest_mod_route: 1 cpp_type: 0 dest_mod_index: 0
rp_index:
0 priority: 5 rpf_le: 36 station_index: 16388 capwap_mgid_present: 0 mgid 0

=====

```

The following is sample output from the **show tech-support platform layer3 unicast vrf** command:

```

Device# show tech-support platform layer3 unicast vrf vr1 dstIP 10.0.0.20
srcIP 10.0.0.10

```

```

.
.
.
destination IP: 10.0.0.20
source IP: 10.0.0.10
vrf name :

```

```

Switch/Stack Mac Address : 5006.ab89.0280 - Local Mac Address
Mac persistency wait time: Indefinite

```

| Switch# | Role   | Mac Address    | Priority | H/W Version | Current State |
|---------|--------|----------------|----------|-------------|---------------|
| *1      | Active | 5006.ab89.0280 | 1        | V02         | Ready         |

```

----- show switch -----

```

## show tech-support platform layer3

```
10.0.0.10 -> 10.0.0.20 =>IP adj out of GigabitEthernet1/0/7, addr 10.0.0.20
```

```
----- show ip cef exact-route platform 10.0.0.10 10.0.0.20 -----
```

```
nexthop is 10.0.0.20
```

```

Protocol Interface Address
IP GigabitEthernet1/0/7 10.0.0.20(8)
0 packets, 0 bytes
epoch 0
sourced in sev-epoch 0
Encap length 14
00211BFDE6495006AB8902C00800
L2 destination address byte offset 0
L2 destination address byte length 6
Link-type after encap: ip
ARP

```

```
----- show adjacency 10.0.0.20 detail -----
```

```

Routing entry for 10.0.0.0/24
Known via "connected", distance 0, metric 0 (connected, via interface)
Routing Descriptor Blocks:
* directly connected, via GigabitEthernet1/0/7
Route metric is 0, traffic share count is 1

```

```
----- show ip route 10.0.0.20 -----
```

```

10.0.0.20/32, epoch 3, flags [attached]
Adj source: IP adj out of GigabitEthernet1/0/7, addr 10.0.0.20 FF90E67820
Dependent covered prefix type adjfib, cover 10.0.0.0/24
attached to GigabitEthernet1/0/7

```

```
----- show ip cef 10.0.0.20 detail -----
```

```
ip prefix: 10.0.0.20/32
```

```
Forwarding Table
```

```

10.0.0.20/32 -> OBJ_ADJACENCY (29), urpf: 30
Connected Interface: 31
Prefix Flags: Directly L2 attached
OM handle: 0x10205416d8

```

```
----- show platform software ip switch 1 R0 cef prefix 10.0.0.20/32 detail -----
```

```
OBJ_ADJACENCY found: 29
```

```
Number of adjacency objects: 5
```

```
Adjacency id: 0x1d (29)
  Interface: GigabitEthernet1/0/7, IF index: 31, Link Type: MCP_LINK_IP
  Encap: 0:21:1b:fd:e6:49:50:6:ab:89:2:c0:8:0
  Encap Length: 14, Encap Type: MCP_ET_ARPA, MTU: 1500
  Flags: no-l3-inject
  Incomplete behavior type: None
  Fixup: unknown
  Fixup_Flags_2: unknown
  Nexthop addr: 10.0.0.20
  IP FRR MCP_ADJ_IPFRR_NONE 0
  OM handle: 0x1020541348
```

```
----- show platform software adjacency switch 1 R0 index 29 -----
```

```
Forwarding Table
```

```
10.0.0.20/32 -> OBJ_ADJACENCY (29), urpf: 30
Connected Interface: 31
Prefix Flags: Directly L2 attached
aom id: 393, HW handle: (nil) (created)
```

```
----- show platform software ip switch 1 F0 cef prefix 10.0.0.20/32 detail -----
```

```
OBJ_ADJACENCY found: 29
```

```
Number of adjacency objects: 5
```

```
Adjacency id: 0x1d (29)
  Interface: GigabitEthernet1/0/7, IF index: 31, Link Type: MCP_LINK_IP
  Encap: 0:21:1b:fd:e6:49:50:6:ab:89:2:c0:8:0
  Encap Length: 14, Encap Type: MCP_ET_ARPA, MTU: 1500
  Flags: no-l3-inject
  Incomplete behavior type: None
  Fixup: unknown
  Fixup_Flags_2: unknown
  Nexthop addr: 10.0.0.20
  IP FRR MCP_ADJ_IPFRR_NONE 0
  aom id: 391, HW handle: (nil) (created)
```

```
----- show platform software adjacency switch 1 F0 index 29 -----
```

```
found aom id: 391
```

**show tech-support platform layer3**

```
Object identifier: 391
  Description: adj 0x1d, Flags None
  Status: Done, Epoch: 0, Client data: 0xc6a747a8
```

```
----- show platform software object-manager switch 1 F0 object 391 -----
```

```
Object identifier: 66
  Description: intf GigabitEthernet1/0/7, handle 31, hw handle 31, HW dirty: NONE AOM dirty
  NONE
  Status: Done
```

```
----- show platform software object-manager switch 1 F0 object 391 parents -----
```

```
Object identifier: 393
  Description: PREFIX 10.0.0.20/32 (Table id 0)
  Status: Done
```

```
.
.
.
```

Output fields are self-explanatory.

**Related Commands**

| Command                           | Description  |
|-----------------------------------|--|
| <b>show tech-support platform</b> | Displays detailed information about a platform for use by technical support. |

# show tech-support platform mld\_snooping

To display Multicast Listener Discovery (MLD) snooping information about a group, use the **show tech-support platform mld\_snooping** command in privileged EXEC mode.

```
show tech-support platform mld_snooping [{Group_ipv6Addr ipv6-address }][{vlan vlan-ID}]
```

| Syntax Description | Group_ipv6Addr             | (Optional) Displays snooping information about the specified group address.         |
|--------------------|----------------------------|---|
|                    | <i>ipv6-address</i>        | (Optional) IPv6 address of the group.   |
|                    | <b>vlan</b> <i>vlan-ID</i> | (Optional) Displays MLD snooping VLAN information. Valid values are from 1 to 4094. |

| 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 an external file (for example, **show tech-support platform mld\_snooping | redirect flash:filename**) in the local writable storage file system or remote file system.

## Examples

The following is sample output from the **show tech-support platform mld\_snooping** command:

```
Device# show tech-support platform mld_snooping GroupIPv6Addr FF02::5:1
```

```
.
.
.
```

```
----- show running-config -----
```

```
Building configuration...
```

```
Current configuration : 11419 bytes
```

```
!
! Last configuration change at 09:17:04 UTC Thu Sep 6 2018
!
```

```
version 16.10
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service call-home
no platform punt-keepalive disable-kernel-core
!
hostname Switch
!
vrf definition Mgmt-vrf
```

```

!
address-family ipv4
exit-address-family
!
address-family ipv6
exit-address-family
!
!
no aaa new-model
switch 1 provision ws-c3650-12x48uq
!
!
!
!
call-home
! If contact email address in call-home is configured as sch-smart-licensing@cisco.com
! the email address configured in Cisco Smart License Portal will be used as contact email
address to send SCH notifications.
contact-email-addr sch-smart-licensing@cisco.com
profile "profile-1"
  active
  destination transport-method http
  no destination transport-method email
!
!
!
!
ip admission watch-list expiry-time 0
!
!
!
login on-success log
!
!
!
!
no device-tracking logging theft
!
crypto pki trustpoint TP-self-signed-559433368
  enrollment selfsigned
  subject-name cn=IOS-Self-Signed-Certificate-559433368
  revocation-check none
  rsakeypair TP-self-signed-559433368
!
crypto pki trustpoint SLA-TrustPoint
  enrollment pkcs12
  revocation-check crl
!
!
crypto pki certificate chain TP-self-signed-559433368
certificate self-signed 01
  30820229 30820192 A0030201 02020101 300D0609 2A864886 F70D0101 05050030
  30312E30 2C060355 04031325 494F532D 53656C66 2D536967 6E65642D 43657274
  69666963 6174652D 35353934 33333336 38301E17 0D313531 32303331 32353432
  325A170D 32303031 30313030 30303030 5A303031 2E302C06 03550403 1325494F
  532D5365 6C662D53 69676E65 642D4365 72746966 69636174 652D3535 39343333
  33363830 819F300D 06092A86 4886F70D 01010105 0003818D 00308189 02818100
  AD8C9C3B FEE7FFC8 986837D2 4C126172 446C3C53 E040F798 4BA61C97 7506FDCE
  46365D0A E47E3F4F C774CA5B 73E2A8DD B72A2E98 C66DB196 94E8150F 0B669CF6
  AA5BC4CD FC2E02F6 FE08B17F 0164FC19 7DC84ABB C99D91D6 398233FF 814EF6DA
  6DC8FC20 CA12C0D6 1CB28EDA 6ADD6DFA 7E3E8281 4A189A9A AA44FCC0 BA9BD8A5
  02030100 01A35330 51300F06 03551D13 0101FF04 05300301 01FF301F 0603551D

```



```

23041830 16801448 668D668E C92914BB 69E9BA64 F61228DE 132E2030 1D060355
1D0E0416 04144866 8D668EC9 2914BB69 E9BA64F6 1228DE13 2E20300D 06092A86
4886F70D 01010505 00038181 0000F1D3 3DD1E5F1 EB714A95 D5819933 CAD0C943
59927D55 9D70CAD0 D64830EB D54380AD D2B5B613 F8AF7A5B 1F801134 246F760D
5E5515DB D098304F 5086F6CE 88E8B576 F6B93A88 F458FDCF 91A42D7E FA741908
5C892D78 600FB655 E6C5A4D0 6C1F1B9A 3AECA550 E3DC0881 01C4D004 7AB65BC3
88CF24DE DAA19474 51B535A5 0C
quit
crypto pki certificate chain SLA-TrustPoint
certificate ca 01
30820321 30820209 A0030201 02020101 300D0609 2A864886 F70D0101 0B050030
32310E30 0C060355 040A1305 43697363 6F312030 1E060355 04031317 43697363
6F204C69 63656E73 696E6720 526F6F74 20434130 1E170D31 33303533 30313934
3834375A 170D3338 30353330 31393438 34375A30 32310E30 0C060355 040A1305
43697363 6F312030 1E060355 04031317 43697363 6F204C69 63656E73 696E6720
526F6F74 20434130 82012230 0D06092A 864886F7 0D010101 05000382 010F0030
82010A02 82010100 A6BCBD96 131E05F7 145EA72C 2CD686E6 17222EA1 F1EFF64D
CBB4C798 212AA147 C655D8D7 9471380D 8711441E 1AAF071A 9CAE6388 8A38E520
1C394D78 462EF239 C659F715 B98C0A59 5BBB5CBD 0CFEBA3 700A8BF7 D8F256EE
4AA4E80D DB6FD1C9 60B1FD18 FFC69C96 6FA68957 A2617DE7 104FDC5F EA2956AC
7390A3EB 2B5436AD C847A2C5 DAB553EB 69A9A535 58E9F3E3 COBD23CF 58BD7188
68E69491 20F320E7 948E71D7 AE3BCC84 F10684C7 4BC8E00F 539BA42B 42C68BB7
C7479096 B4CB2D62 EA2F505D C7B062A4 6811D95B E8250FC4 5D5D5FB8 8F27D191
C55F0D76 61F9A4CD 3D992327 A8BB03BD 4E6D7069 7CBADF8B DF5F4368 95135E44
DFC7C6CF 04DD7FD1 02030100 01A34230 40300E06 03551D0F 0101FF04 04030201
06300F06 03551D13 0101FF04 05300301 01FF301D 0603551D 0E041604 1449DC85
4B3D31E5 1B3E6A17 606AF333 3D3B4C73 E8300D06 092A8648 86F70D01 010B0500
03820101 00507F24 D3932A66 86025D9F E838AE5C 6D4DF6B0 49631C78 240DA905
604EDCDE FF4FED2B 77FC460E CD636FDB DD44681E 3A5673AB 9093D3B1 6C9E3D8B
D98987BF E40CBD9E 1AECA0C2 2189BB5C 8FA85686 CD98B646 5575B146 8DFC66A8
467A3DF4 4D565700 6ADF0F0D CF835015 3C04FF7C 21E878AC 11BA9CD2 55A9232C
7CA7B7E6 C1AF74F6 152E99B7 B1FCF9BB E973DE7F 5BDDEB86 C71E3B49 1765308B
5FB0DA06 B92AFE7F 494E8A9E 07B85737 F3A58BE1 1A48A229 C37C1E69 39F08678
80DDCD16 D6BACECA EEBC7CF9 8428787B 35202CDC 60E4616A B623CDBD 230E3AFB
418616A9 4093E049 4D10AB75 27E86F73 932E35B5 8862FDAE 0275156F 719BB2F0
D697DF7F 28
quit
!
!
!
diagnostic bootup level minimal
diagnostic monitor syslog
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
!
!
!
redundancy
mode sso
!
!
!
!
!
class-map match-any system-cpp-police-topology-control
description Topology control
class-map match-any system-cpp-police-sw-forward
description Sw forwarding, L2 LVX data, LOGGING
class-map match-any system-cpp-default
description EWLC control, EWLC data, Inter FED
class-map match-any system-cpp-police-sys-data
description Learning cache ovfl, High Rate App, Exception, EGR Exception, NFL SAMPLED

```

## show tech-support platform mld\_snooping

```

DATA, RPF Failed
class-map match-any AutoQos-4.0-RT1-Class
  match dscp ef
  match dscp cs6
class-map match-any system-cpp-police-punt-webauth
  description Punt Webauth
class-map match-any AutoQos-4.0-RT2-Class
  match dscp cs4
  match dscp cs3
  match dscp af41
class-map match-any system-cpp-police-l2lvx-control
  description L2 LVX control packets
class-map match-any system-cpp-police-forus
  description Forus Address resolution and Forus traffic
class-map match-any system-cpp-police-multicast-end-station
  description MCAST END STATION
class-map match-any system-cpp-police-multicast
  description Transit Traffic and MCAST Data
class-map match-any system-cpp-police-l2-control
  description L2 control
class-map match-any system-cpp-police-dot1x-auth
  description DOT1X Auth
class-map match-any system-cpp-police-data
  description ICMP redirect, ICMP_GEN and BROADCAST
class-map match-any system-cpp-police-stackwise-virt-control
  description Stackwise Virtual
class-map match-any system-cpp-police-control-low-priority
  description ICMP redirect and general punt
class-map match-any system-cpp-police-wireless-priority1
  description Wireless priority 1
class-map match-any system-cpp-police-wireless-priority2
  description Wireless priority 2
class-map match-any system-cpp-police-wireless-priority3-4-5
  description Wireless priority 3,4 and 5
class-map match-any non-client-nrt-class
class-map match-any system-cpp-police-routing-control
  description Routing control and Low Latency
class-map match-any system-cpp-police-protocol-snooping
  description Protocol snooping
class-map match-any system-cpp-police-dhcp-snooping
  description DHCP snooping
class-map match-any system-cpp-police-system-critical
  description System Critical and Gold Pkt
!
policy-map system-cpp-policy
  class system-cpp-police-data
    police rate 200 pps
  class system-cpp-police-routing-control
    police rate 500 pps
  class system-cpp-police-control-low-priority
  class system-cpp-police-wireless-priority1
  class system-cpp-police-wireless-priority2
  class system-cpp-police-wireless-priority3-4-5
policy-map port_child_policy
  class non-client-nrt-class
    bandwidth remaining ratio 10
!
!
!
!
!
!
!
```

```
!  
!  
interface GigabitEthernet0/0  
  vrf forwarding Mgmt-vrf  
  no ip address  
  speed 1000  
  negotiation auto  
!  
interface GigabitEthernet1/0/1  
  switchport mode access  
  macsec network-link  
!  
interface GigabitEthernet1/0/2  
!  
interface GigabitEthernet1/0/3  
!  
interface TenGigabitEthernet1/1/1  
!  
interface TenGigabitEthernet1/1/2  
!  
interface TenGigabitEthernet1/1/3  
!  
interface TenGigabitEthernet1/1/4  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
ip forward-protocol nd  
ip http server  
ip http authentication local  
ip http secure-server  
!  
ip access-list extended AutoQos-4.0-wlan-Acl-Bulk-Data  
  permit tcp any any eq 22  
  permit tcp any any eq 465  
  permit tcp any any eq 143  
  permit tcp any any eq 993  
  permit tcp any any eq 995  
  permit tcp any any eq 1914  
  permit tcp any any eq ftp  
  permit tcp any any eq ftp-data  
  permit tcp any any eq smtp  
  permit tcp any any eq pop3  
ip access-list extended AutoQos-4.0-wlan-Acl-MultiEnhanced-Conf  
  permit udp any any range 16384 32767  
  permit tcp any any range 50000 59999  
ip access-list extended AutoQos-4.0-wlan-Acl-Scavenger  
  permit tcp any any range 2300 2400  
  permit udp any any range 2300 2400  
  permit tcp any any range 6881 6999  
  permit tcp any any range 28800 29100  
  permit tcp any any eq 1214  
  permit udp any any eq 1214  
  permit tcp any any eq 3689  
  permit udp any any eq 3689  
  permit tcp any any eq 11999  
ip access-list extended AutoQos-4.0-wlan-Acl-Signaling  
  permit tcp any any range 2000 2002  
  permit tcp any any range 5060 5061  
  permit udp any any range 5060 5061  
ip access-list extended AutoQos-4.0-wlan-Acl-Transactional-Data  
  permit tcp any any eq 443  
  permit tcp any any eq 1521
```

## show tech-support platform mld\_snooping

```

permit udp any any eq 1521
permit tcp any any eq 1526
permit udp any any eq 1526
permit tcp any any eq 1575
permit udp any any eq 1575
permit tcp any any eq 1630
permit udp any any eq 1630
permit tcp any any eq 1527
permit tcp any any eq 6200
permit tcp any any eq 3389
permit tcp any any eq 5985
permit tcp any any eq 8080
!
!
!
ipv6 access-list preauth_ipv6_acl
permit udp any any eq domain
permit tcp any any eq domain
permit icmp any any nd-ns
permit icmp any any nd-na
permit icmp any any router-solicitation
permit icmp any any router-advertisement
permit icmp any any redirect
permit udp any eq 547 any eq 546
permit udp any eq 546 any eq 547
deny ipv6 any any
!
control-plane
service-policy input system-cpp-policy
!
!
line con 0
  stopbits 1
line aux 0
  stopbits 1
line vty 0 4
  login
line vty 5 15
  login
!
!
mac address-table notification mac-move
!
!
!
!
end

-----show switch | Include Ready-----

*1          Active   188b.9dfc.eb00    1          V00        Ready

----- show ipv6 mld snooping address | i FF02::5:1 -----

Vlan      Group                Type      Version    Port List
-----
123       FF02::5:1            mld       v2         Gi2/0/1

Device#

```

Output fields are self-explanatory.

**Related Commands**

| <b>Command</b>                    | <b>Description</b>   |
|-----------------------------------|--|
| <b>ipv6 mld snooping</b>          | Enables MLDv2 protocol snooping globally.                                    |
| <b>show ipv6 mld snooping</b>     | Displays MLDv2 snooping information.   |
| <b>show tech-support platform</b> | Displays detailed information about a platform for use by technical support. |

# show tech-support port

To display port-related information for use by technical support, use the **show tech-support port** command in privileged EXEC mode.

## show tech-support port

**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 the **show tech-support port** command is very long. To better manage this output, you can redirect the output to an external file (for example, **show tech-support port | redirect flash:filename**) in the local writable storage file system or remote file system.

The output of this command displays the following commands:

- **show clock**
- **show version**
- **show module**
- **show inventory**
- **show interface status**
- **show interface counters**
- **show interface counters errors**
- **show interfaces**
- **show interfaces capabilities**
- **show controllers**
- **show controllers utilization**
- **show idprom interface**
- **show controller ethernet-controller phy detail**
- **show switch**
- **show platform software fed switch active port summary**
- **show platform software fed switch ifm interfaces ethernet**
- **show platform software fed switch ifm mappings**
- **show platform software fed switch ifm mappings lpn**

- show platform software fed switch ifm mappings gpn
- show platform software fed switch ifm mappings port-le
- show platform software fed switch ifm if-id
- show platform software fed switch active port if\_id

## Examples

The following is sample output from the **show tech-support port** command:

```
Device# show tech-support port
.
.
.
----- show controllers utilization -----

Port          Receive Utilization  Transmit Utilization
Gi1/0/1       0 0
Gi1/0/2       0 0
Gi1/0/3       0 0
Gi1/0/4       0 0
Gi1/0/5       0 0
Gi1/0/6       0 0
Gi1/0/7       0 0
Gi1/0/8       0 0
Gi1/0/9       0 0
Gi1/0/10      0 0
Gi1/0/11      0 0
Gi1/0/12      0 0
Gi1/0/13      0 0
Gi1/0/14      0 0
Gi1/0/15      0 0
Gi1/0/16      0 0
Gi1/0/17      0 0
Gi1/0/18      0 0
Gi1/0/19      0 0
Gi1/0/20      0 0
Gi1/0/21      0 0
Gi1/0/22      0 0
Gi1/0/23      0 0
Gi1/0/24      0 0
Gi1/0/25      0 0
Gi1/0/26      0 0
Gi1/0/27      0 0
Gi1/0/28      0 0
Gi1/0/29      0 0
Gi1/0/30      0 0
Gi1/0/31      0 0
Gi1/0/32      0 0
Gi1/0/33      0 0
Gi1/0/34      0 0
Gi1/0/35      0 0
Gi1/0/36      0 0
Tel/0/37      0 0
Tel/0/38      0 0
Tel/0/39      0 0
Tel/0/40      0 0
Tel/0/41      0 0
Tel/0/42      0 0
Tel/0/43      0 0
Tel/0/44      0 0
```

## show tech-support port

```
Te1/0/45      0  0
Te1/0/46      0  0
Te1/0/47      0  0
Te1/0/48      0  0
Te1/1/1       0  0
Te1/1/2       0  0
Te1/1/3       0  0
Te1/1/4       0  0
```

```
Total Ports : 52
Total Ports Receive Bandwidth Percentage Utilization : 0
Total Ports Transmit Bandwidth Percentage Utilization : 0
```

```
Average Switch Percentage Utilization : 0
```

```
----- show idprom interface Gi1/0/1 -----
```

```
*Sep  7 08:57:24.249: No module is present
.
.
.
```

The output fields are self-explanatory.



# show tech-support pvlan

To display the private VLAN related information, use the **show tech-support pvlan** command in privileged EXEC mode.

```
show tech-support pvlan [{pvlan_id pvlan-id}]
```

|                           |                                 |                                |
|---------------------------|---------------------------------|--------------------------------|
| <b>Syntax Description</b> | <b>pvlan_id</b> <i>pvlan-id</i> | Specifies the private VLAN ID. |
| <b>Command Default</b>    | Privileged EXEC (#)             |                                |
| <b>Command History</b>    | <b>Release</b>                  | <b>Modification</b>            |
|                           | Cisco IOS XE Amsterdam 17.3.1   | This command was introduced.   |

**Usage Guidelines**

The output from the **show tech-support pvlan** command is very long. To better manage this output, you can redirect the output to a file in the local writable storage file system or the remote file system by using the **show tech-support pvlan [ pvlan\_id pvlan-id ] | redirect location:filename** . Redirecting the output to a file also makes sending the output to your Cisco Technical Assistance Center (TAC) representative easier.

To view the output of the redirected file, use the command **more location:filename**.

# show tech-support resource

To display the switch resource information, use the **show tech-support resource** command in privileged EXEC mode.

## show tech-support resource

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

**Command Modes** Privileged EXEC (#)

| Command History | Release                       | Modification                 |
|-----------------|-------------------------------|------------------------------|
|                 | Cisco IOS XE Amsterdam 17.2.1 | This command was introduced. |

## Examples

The following is a sample output of the **show tech-support resource** command:

```
Device> enable
Device# show tech-support resource
----- show clock -----

*17:57:36.220 UTC Fri Jun 4 2021

----- show version -----

Cisco IOS XE Software, Version 17.03.03
Cisco IOS Software [Amsterdam], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 17.3.3,
  RELEASE SOFTWARE (fc7)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2021 by Cisco Systems, Inc.
Compiled Thu 04-Mar-21 12:32 by mcpre

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GPL code under the terms of GPL Version 2.0. For more details, see the
documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.

ROM: IOS-XE ROMMON
BOOTLDR: System Bootstrap, Version 17.5.2r, RELEASE SOFTWARE (P)

stack-nyqcr8 uptime is 3 weeks, 1 day, 19 hours, 18 minutes
Uptime for this control processor is 3 weeks, 1 day, 19 hours, 21 minutes
System returned to ROM by Reload Command
System image file is "flash:packages.conf"
Last reload reason: Reload Command
```

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at: <http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

Technology Package License Information:

```

-----
Technology-package                               Technology-package
Current                                           Next reboot
-----
network-advantage   Smart License               network-advantage
dna-advantage       Subscription Smart License             dna-advantage
AIR License Level:  AIR DNA Advantage
Next reload AIR license Level:  AIR DNA Advantage

```

Smart Licensing Status: Registration Not Applicable/Not Applicable

cisco C9300-48S (X86) processor with 1331521K/6147K bytes of memory.  
 Processor board ID FCW2315G10C  
 2 Virtual Ethernet interfaces  
 224 Gigabit Ethernet interfaces  
 36 2.5 Gigabit Ethernet interfaces  
 100 Ten Gigabit Ethernet interfaces  
 16 TwentyFive Gigabit Ethernet interfaces  
 16 Forty Gigabit Ethernet interfaces  
 48 Five Gigabit Ethernet interfaces  
 2048K bytes of non-volatile configuration memory.  
 8388608K bytes of physical memory.  
 1638400K bytes of Crash Files at crashinfo:.  
 11264000K bytes of Flash at flash:.

```

Base Ethernet MAC Address       : 4c:bc:48:97:ec:80
Motherboard Assembly Number     : 73-19406-03C
Motherboard Serial Number       : FOC23122J45
Model Revision Number           : A0
Motherboard Revision Number     : 07
Model Number                    : C9300-48S
System Serial Number            : FCW2315G10C
CLEI Code Number                : INM2900ARB

```

```

Switch Ports Model          SW Version  SW Image        Mode
-----
*   1 65    C9300-48S    17.03.03    CAT9K_IOSXE    INSTALL

```

Configuration register is 0x102

----- show running-config -----

```
Building configuration...

Current configuration : 31750 bytes
!
! Last configuration change at 17:55:02 UTC Fri Jun 4 2021
!
version 17.3
service timestamps debug datetime msec
service timestamps log datetime msec
service call-home
platform punt-keepalive disable-kernel-core
!
hostname stack-nyqcr8
!
!
vrf definition Mgmt-vrf
!
address-family ipv4
exit-address-family
!
address-family ipv6
exit-address-family
!
logging buffered 1000000
!
no aaa new-model
boot system switch all flash:packages.conf
switch 1 provision c9300-48s
switch 2 provision c9300-48p
switch 3 provision c9300-24u
switch 4 provision c9300-24s
switch 5 provision c9300-48p
switch 6 provision c9300-24ux
switch 7 provision c9300-48un
switch 8 provision c9300-48uxm
software auto-upgrade enable
!
!
!
!
!
!
!
!
!
ip domain name byodis
!
!
!
login on-success log
!
!
!
!
!
!
no device-tracking logging theft
!
crypto pki trustpoint TP-self-signed-1829944574
enrollment selfsigned
subject-name cn=IOS-Self-Signed-Certificate-1829944574
```

```

revocation-check none
rsakeypair TP-self-signed-1829944574
!
crypto pki trustpoint DNAC-CA
  enrollment mode ra
  enrollment terminal
  usage ssl-client
  revocation-check crl none
!
crypto pki trustpoint SLA-TrustPoint
  enrollment pkcs12
  revocation-check crl
!
!
crypto pki certificate chain TP-self-signed-1829944574
certificate self-signed 01
  30820330 30820218 A0030201 02020101 300D0609 2A864886 F70D0101 05050030
  31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D 43657274
  69666963 6174652D 31383239 39343435 3734301E 170D3231 30353132 32323132
  33375A17 0D333130 35313232 32313233 375A3031 312F302D 06035504 03132649
  4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D31 38323939
  34343537 34308201 22300D06 092A8648 86F70D01 01010500 0382010F 00308201
  0A028201 0100DDCC BF7D66CE FFE20EF3 725757F3 6FAFC721 94D4D60B 6233AD79
  E69AA12C 434C6ECE 98A34568 870DF666 CC4C09EA A80AE81C D607FAA3 A8B3022E
  0700AC7C 55B79266 C628FE55 1CA371A0 B5C47C4D 5445996A 0E6ADFB0 C1FF962D
  4F363522 A3CA9E43 736CA7A9 4C350C13 F4C2B5EC 59EDEAEC D7D74EF4 BF4ECE77
  4B625216 F5DD11C0 B667F9D4 1A6681E1 197B2C18 E7767A0A B798E120 D4616BCB
  99DD3D44 2F55BB2E ED85826F 91AE530E 968AD28F 36767EEE 4597726E 2D997AA0
  CDD33E49 7B814E3D 03C90538 C410F9F4 59147E4F 083B4143 40482C56 0CE5D3CD
  D3C6B337 E768E664 10FF3E35 93624B3F 187AD6A4 55C404BE F1993665 B18FC6A3
  4B968C9E 92E10203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF
  301F0603 551D2304 18301680 14FDB525 614E9C81 4060EFC6 349A80E2 8B0F25F9
  28301D06 03551D0E 04160414 FDB52561 4E9C8140 60EFC634 9A80E28B 0F25F928
  300D0609 2A864886 F70D0101 05050003 82010100 2EACE5C4 6BB136E5 28204E25
  EE8C0514 21ECC597 24BC3B3B D72A34CB CBF950CC 82BADAE2 F58CD72B BE0A0BB9
  509946C4 F1DC5E8D 10184A79 33050AC0 8CD235DA 501C47BA 6920B007 FDF82BD3
  448A1E05 0C726EA7 6F641AA9 6A6172C0 4E2EAB90 CF758F0B 08A5F319 83D42DA1
  B0DF87FE E255864C 5DC87D26 339309D3 813E0B66 FD916E73 2319F717 6F8EF279
  5F13A7CC 2C5A6BA9 052E8D13 6D27B405 41984D8C DDB15B21 11E06F27 D36723F6
  85274D7A 994A8543 F6D8B8B1 9E94AAA9 AA660F19 951E2DB8 EA473526 89ED4161
  CCBF2032 9D03BF11 92FB4D62 8AA3A09D 374DB7DD 8566452B 4DEA0AF4 5B0D88B1
  B355144A FC6CC495 8058EFB2 4CF83651 149BA5DB
quit
crypto pki certificate chain DNAC-CA
certificate ca 43338DDB13667FF821F1D6502649F8926E67C11C
  308203A5 3082028D A0030201 02021443 338DDB13 667FF821 F1D65026 49F8926E
  67C11C30 0D06092A 864886F7 0D01010B 05003062 312D302B 06035504 030C2437
  36613236 3864642D 38393936 2D366138 322D6533 65352D34 36663366 62656137
  65306431 16301406 0355040A 0C0D4369 73636F20 53797374 656D7331 19301706
  0355040B 0C104369 73636F20 444E4120 43656E74 6572301E 170D3231 30343233
  32303431 30315A17 0D323430 31313832 30343130 315A3062 312D302B 06035504
  030C2437 36613236 3864642D 38393936 2D366138 322D6533 65352D34 36663366
  62656137 65306431 16301406 0355040A 0C0D4369 73636F20 53797374 656D7331
  19301706 0355040B 0C104369 73636F20 444E4120 43656E74 65723082 0122300D
  06092A86 4886F70D 01010105 00038201 0F003082 010A0282 010100AF 43FF5F25
  74C29B94 6E2A0FA1 A45D07B3 FD560BEC 0603B1C4 8B140AA3 A69877B8 6FAE6348
  8C7D9D3B AFDD99D2 235098C5 C5B56FD1 3EFC8258 6FD37FEE 1783B463 A490022A
  EED21295 B20CACB3 24273372 DF15FBAB A396FB54 FF348FB1 B3A34B49 59B1113A
  66595D17 EBE521A2 E3AA10BF 766F3A83 8046F031 26F0A642 609CF57D 6F6BCE6C
  5CFA6105 C783F6C6 3D414CB9 A5A572E6 FEB4CD9F D9B66208 D253F222 A2DEFEB9
  626C2AC5 6B4532DA 39429736 55D99A14 4A69D702 158469D6 5F6A6CBF A311B98F
  D459851C 5C45875A 88619DF5 22220D6C B689FE6F 989C8573 2E5492EE 9F69E108
  0892726B BB7CD254 FFE9AEAA 769395F5 1A930E7B 4AD0B5C6 603D2B02 03010001
  A3533051 301D0603 551D0E04 160414CC 002C9091 065EE9E7 003B5F10 ED1A1ED3

```

## show tech-support resource

```

76D4DD30 1F060355 1D230418 30168014 CC002C90 91065EE9 E7003B5F 10ED1A1E
D376D4DD 300F0603 551D1301 01FF0405 30030101 FF300D06 092A8648 86F70D01
010B0500 03820101 00719B9F 5D4F7FFE 29071394 1E82BF02 7F8BF38E 796BDFC7
DF2750DC 7D146E0D 094F17C6 6A8559E6 090FEA1E E2734F18 4A7D8647 A1AD4190
E0B0153A 447E9CC3 4A87B2D2 9A752F09 776CE638 4404391F F898179E 73752372
7108D675 5859CC7E C2AABAA9 C1027074 3B2E0195 02F2822C 14B7F168 EC4F91D1
A4EEEA07 73F92A61 9B6AE69F 379F3F77 CEF6A89B 0270F25F 2319E4FD 3795DFB6
C4E206FB 8E2A236A D3A2D012 DEDEB99D 8DE1C4A1 D4BE3AEC 97A2CDE3 7DB719FC
99DB5D14 4D00CBF8 EF67CE28 AC77AE17 88ECDAA5 199F7F88 9F513851 37ECCA2F
42781701 C5FC45C2 D8B0CE82 1306D4E4 7C617076 FB562A07 A3CAF126 5B860C56
582F1A97 E5AF26B5 65
quit
crypto pki certificate chain SLA-TrustPoint
certificate ca 01
3082031B 30820203 A0030201 02020101 300D0609 2A864886 F70D0101 0B050030
2F310E30 0C060355 040A1305 43697363 6F311D30 1B060355 04031314 4C696365
6E73696E 6720526F 6F74202D 20444556 301E170D 31333034 32343231 35353433
5A170D33 33303432 34323135 3534335A 302F310E 300C0603 55040A13 05436973
636F311D 301B0603 55040313 144C6963 656E7369 6E672052 6F6F7420 2D204445
56308201 22300D06 092A8648 86F70D01 01010500 0382010F 00308201 0A028201
01009C56 7101D61E DF2EBCC3 BA7AE0DB B241B3B4 328A9B00 EB8A80D0 2AA86F5E
F1AEBFDE B67BD6AD 7DAD7B43 F582753B FFCC1CA5 A7841A07 6934D3AF 99078EF6
179196FA 4FB3F2ED 3942C756 BF1CA0A9 CC98A7A7 F9E43724 D9E61D47 89E9E792
DD9F27B4 517C2BDE D0EB5B9A 787BA085 D9BBF003 F0563BE0 A4450C8F 127B5583
3EBC1385 2D9BAD98 68D3AE07 5C27987C 6B814B99 0686E14A 5F61753C 813089E6
AEC48C68 F6D45267 0E365F44 B4456E11 96DCB950 233C8ADB 9FEEBAF1 2B5F3BB6
7CE521B5 F277EBF6 03B7B0A4 958C9C7D 5460C20B CF9CCFC7 14B80F58 B5268947
6D081172 26916B41 FB07DF42 EB9B9408 EC346138 23FBD8C4 19909697 A30845F3
01C50203 010001A3 42304030 0E060355 1D0F0101 FF040403 02010630 0F060355
1D130101 FF040530 030101FF 301D0603 551D0E04 16041443 214521B5 FB217A1A
4D1BB702 36E664CB EC8B6530 0D06092A 864886F7 0D01010B 05000382 01010085
F1B1F2AE AE7D2F9C AB0351C3 29E3F1AE 982DF11F 5E3C90F6 00B3CDED 5A1491FB
DF07E06C AA0F4325 9FB4C4AE 2080F675 8C3B7AC5 4EAAA03E C5B50A2F 670AFF87
EDA6462F CFC43967 C024AB32 EE3CCDCF A04B9DAE 1BBABBDA C8DF5587 CF51CB1C
005A282F 8B518A5A 8C6F9B3C AABA3446 32EF3A75 C2F45450 7A9BCFD3 0C8BE54A
11872DE0 CF1200D0 D1018FD9 AC685968 167E421C 9BC394ED 9BC85463 83B28146
07B2BDED DFC1605B 4D16007B 68723E25 55908512 4EEB0A70 B2A74C2A CB1EC882
C3215B87 6FC74304 241E59D7 C7C02C6D BD3042F5 196E8133 7A4446A4 81216E70
CF52CF22 50A7D23E FA9F6B07 FB0F6386 9DCC3BBC 65250693 38CF6BA6 CB8EFD
quit
!
!
license boot level network-advantage addon dna-advantage
license smart transport off
<output truncated>

```

# show version

To display information about the currently loaded software along with hardware and device information, use the **show version** command in user EXEC or privileged EXEC mode.

**show version** [{switch *node*}] [{**installed** | **provisioned** | **running**}]

| Syntax Description | switch <i>node</i> | (optional) Only a single switch may be specified. Default is all switches in a stacked system. |
|--------------------|--------------------|--|
|                    | running            | (optional) Specifies information on the files currently running.                               |
|                    | provisioned        | (optional) Specifies information on the software files that are provisioned.                   |
|                    | installed          | Specifies information on the software installed on the RP                                      |
|                    | user-interface     | Specifies information on the files related to the user-interface.                              |

**Command Default** No default behavior or values.

**Command Modes** User EXEC (>)

Privileged EXEC (#)

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** This command displays information about the Cisco IOS software version currently running on a device, the ROM Monitor and Bootflash software versions, and information about the hardware configuration, including the amount of system memory. Because this command displays both software and hardware information, the output of this command is the same as the output of the **show hardware** command. (The **show hardware** command is a command alias for the **show version** command.)

Specifically, the **show version** command provides the following information:

- Software information
  - Main Cisco IOS image version
  - Main Cisco IOS image capabilities (feature set)
  - Location and name of bootfile in ROM
  - Bootflash image version (depending on platform)
- Device-specific information
  - Device name
  - System uptime
  - System reload reason
  - Config-register setting
  - Config-register settings for after the next reload (depending on platform)

- Hardware information
  - Platform type
  - Processor type
  - Processor hardware revision
  - Amount of main (processor) memory installed
  - Amount I/O memory installed
  - Amount of Flash memory installed on different types (depending on platform)
  - Processor board ID

The output of this command uses the following format:

```
Cisco IOS Software, <platform> Software (<image-id>), Version <software-version>,
  <software-type>

Technical Support: http://www.cisco.com/techsupport
Copyright (c) <date-range> by Cisco Systems, Inc.
Compiled <day> <date> <time> by <compiler-id>

ROM: System Bootstrap, Version <software-version>, <software-type>
BOOTLDR: <platform> Software (image-id), Version <software-version>, <software-type>

<router-name> uptime is <w> weeks, <d> days, <h> hours,
<m> minutes
System returned to ROM by reload at <time> <day> <date>
System image file is "<filesystem-location>/<software-image-name>"
Last reload reason: <reload-reason>Cisco <platform-processor-type>
processor (revision <processor-revision-id>) with <free-DRAM-memory>
K/<packet-memory>K bytes of memory.
Processor board ID <ID-number>

<CPU-type> CPU at <clock-speed>Mhz, Implementation <number>, Rev <
Revision-number>, <kilobytes-Processor-Cache-Memory>KB <cache-Level> Cache
```

See the Examples section for descriptions of the fields in this output.

Entering **show version** displays the IOS XE software version and the IOS XE software bundle which includes a set of individual packages that comprise the complete set of software that runs on the switch.

The **show version running** command displays the list of individual packages that are currently running on the switch. When booted in installed mode, this is typically the set of packages listed in the booted provisioning file. When booted in bundle mode, this is typically the set of packages contained in the bundle.

The **show version provisioned** command displays information about the provisioned package set.

The following is sample output from the **show version** command on a Cisco Catalyst 9300 Series Switch:

```
Device# show version
Cisco IOS XE Software, Version BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2
Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT9K_IOSXE), Experimental Version
 16.10.20180903:072347
[v1610_throttle-/nobackup/mcpre/BLD-BLD_V1610_THROTTLE_LATEST_20180903_070602 183]
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Mon 03-Sep-18 11:53 by mcpre

Cisco IOS-XE software, Copyright (c) 2005-2018 by cisco Systems, Inc.
```



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ROM: IOS-XE ROMMON  
 BOOTLDR: System Bootstrap, Version 16.10.1r, RELEASE SOFTWARE (P)

C9300 uptime is 20 hours, 7 minutes  
 Uptime for this control processor is 20 hours, 8 minutes  
 System returned to ROM by Image Install  
 System image file is "flash:packages.conf"  
 Last reload reason: Image Install

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:  
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

Technology Package License Information:

| Technology-package<br>Current | Type                       | Technology-package<br>Next reboot |
|-------------------------------|----------------------------|-----------------------------------|
| network-advantage             | Smart License              | network-advantage                 |
| dna-advantage                 | Subscription Smart License | dna-advantage                     |

Smart Licensing Status: UNREGISTERED/EVAL MODE

cisco C9300-24U (X86) processor with 1415813K/6147K bytes of memory.  
 Processor board ID FCW2125LOBH  
 8 Virtual Ethernet interfaces  
 56 Gigabit Ethernet interfaces  
 16 Ten Gigabit Ethernet interfaces  
 4 TwentyFive Gigabit Ethernet interfaces  
 4 Forty Gigabit Ethernet interfaces  
 2048K bytes of non-volatile configuration memory.  
 8388608K bytes of physical memory.  
 1638400K bytes of Crash Files at crashinfo:.  
 1638400K bytes of Crash Files at crashinfo-2:.  
 11264000K bytes of Flash at flash:.  
 11264000K bytes of Flash at flash-2:.  
 0K bytes of WebUI ODM Files at webui:.

## show version

```

Base Ethernet MAC Address      : 70:d3:79:be:6c:80
Motherboard Assembly Number   : 73-17954-06
Motherboard Serial Number     : FOC21230KPX
Model Revision Number         : A0
Motherboard Revision Number   : A0
Model Number                   : C9300-24U
System Serial Number          : FCW2125L0BH

```

| Switch | Ports | Model     | SW Version | SW Image    | Mode    |
|--------|-------|-----------|------------|-------------|---------|
| *      | 1 40  | C9300-24U | 16.10.1    | CAT9K_IOSXE | INSTALL |
|        | 2 40  | C9300-24U | 16.10.1    | CAT9K_IOSXE | INSTALL |

```
Switch 02
```

```
Switch uptime : 20 hours, 8 minutes
```

```

Base Ethernet MAC Address      : 70:d3:79:84:85:80
Motherboard Assembly Number   : 73-17954-06
Motherboard Serial Number     : FOC21230KPK
Model Revision Number         : A0
Motherboard Revision Number   : A0
Model Number                   : C9300-24U
System Serial Number          : FCW2125L03W
Last reload reason            : Image Install

```

```
Configuration register is 0x102
```

In the following example, the **show version running** command is entered on a Cisco Catalyst 9300 Series Switch to view information about the packages currently running on both switches in a 2-member stack:

```

Device# show version running
Package: Provisioning File, version: n/a, status: active
  Role: provisioning file
  File: /flash/packages.conf, on: RP0
  Built: n/a, by: n/a
  File SHA1 checksum: 6a43991bae5b94de0df8083550f827a3c01756c5

Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
active
  Role: rp_base
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: rpboot, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
active
  Role: rp_boot
  File: /flash/cat9k-rpboot.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: n/a

Package: guestshell, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2,
status: active
  Role: guestshell
  File:
/flash/cat9k-guestshell.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0/0

```

```

Built: 2018-09-03_13.11, by: mcpre
File SHA1 checksum: 10827f9f9db3b016d19a926acc6be0541440b8d7

Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
active
  Role: rp_daemons
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0/0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
active
  Role: rp_iosd
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0/0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
active
  Role: rp_security
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0/0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: webui, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
active
  Role: rp_webui
  File: /flash/cat9k-webui.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0/0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 5112d7749b38fale122ce6ee1bfb266ad7eb553a

Package: srdriver, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
active
  Role: srdriver
  File:
/flash/cat9k-srdriver.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg, on:
RP0/0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: aff411e981a8dfc8de14005cc33462dc69f8bfaf

Package: cc_srdriver, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2,
status: active
  Role: cc_srdriver
  File:
/flash/cat9k-cc_srdriver.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: SIP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: e3da784f3e61ef1e153028e53d9dc94b2c9b1bf7

```

In the following example, the **show version provisioned** command is entered on a Cisco Catalyst 9300 Series Switch that is the active switch in a 2-member stack. The **show version provisioned** command displays information about the packages in the provisioned package set.

```

Device# show version provisioned
Package: Provisioning File, version: n/a, status: active
  Role: provisioning file
  File: /flash/packages.conf, on: RP0
  Built: n/a, by: n/a
  File SHA1 checksum: 6a43991bae5b94de0df8083550f827a3c01756c5

```

## show version

```
Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: rp_base
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: guestshell, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2,
status: n/a
  Role: guestshell
  File:
/flash/cat9k-guestshell.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 10827f9f9db3b016d19a926acc6be0541440b8d7

Package: rpboot, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: rp_boot
  File: /flash/cat9k-rpboot.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: n/a

Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: rp_daemons
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: rp_iosd
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: rpbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: rp_security
  File: /flash/cat9k-rpbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 78331327788b2cd00624043d71a15094bd19d885

Package: webui, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: rp_webui
  File: /flash/cat9k-webui.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 5112d7749b38fa1e122ce6ee1bfb266ad7eb553a

Package: wlc, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: rp_wlc
  File: /flash/cat9k-wlc.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: RP0
  Built: 2018-09-03_13.11, by: mcpre
```

```

File SHA1 checksum: ada21bb3d57e1b03e5af2329503ed6caa7236d6e

Package: srdriver, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: srdriver
  File:
/flash/cat9k-srdriver.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg, on:
RP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: aff411e981a8dfc8de14005cc33462dc69f8bfaf

Package: espbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: fp
  File: /flash/cat9k-espbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: ESP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 1a2317485f285a3945b31ae57aa64c56ed30a8c0

Package: sipbase, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: cc
  File: /flash/cat9k-sipbase.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: SIP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: ce821195f0c0bd5e44f21e32fca76cf9b2eed02b

Package: sipspa, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2, status:
n/a
  Role: cc_spa
  File: /flash/cat9k-sipspa.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: SIP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: 54645404860b662d72f8ff7fa5e6e88cb0960e20

Package: cc_srdriver, version: BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2,
status: n/a
  Role: cc_srdriver
  File:
/flash/cat9k-cc_srdriver.BLD_V1610_THROTTLE_LATEST_20180903_070602_V16_10_0_101_2.SSA.pkg,
on: SIP0
  Built: 2018-09-03_13.11, by: mcpre
  File SHA1 checksum: e3da784f3e61ef1e153028e53d9dc94b2c9b1bf7

```

**Table 12: Table 5, show version running Field Descriptions**

| Field    | Description  |
|----------|--|
| Package: | The individual sub-package name.   |
| version: | The individual sub-package version.  |
| status:  | Reveals if the package is active or inactive for the specific Supervisor module.     |
| File:    | The filename of the individual package file.   |
| on:      | The slot number of the Active or Standby Supervisor that this package is running on. |
| Built:   | The date the individual package was built.   |

# system env temperature threshold yellow

To configure the difference between the yellow and red temperature thresholds that determines the value of yellow threshold, use the **system env temperature threshold yellow** command in global configuration mode. To return to the default value, use the **no** form of this command.

**system env temperature threshold yellow** *value*  
**no system env temperature threshold yellow** *value*

## Syntax Description

*value* Specifies the difference between the yellow and red threshold values (in Celsius). The range is 10 to 25.

## Command Default

These are the default values

**Table 13: Default Values for the Temperature Thresholds**

| Device        | Difference between Yellow and Red | Red <sup>1</sup> |
|---------------|-----------------------------------|------------------|
| Catalyst 9500 | 14°C                              | 60°C             |

<sup>1</sup> You cannot configure the red temperature threshold.

## Command Modes

Global configuration

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

You cannot configure the green and red thresholds but can configure the yellow threshold. Use the **system env temperature threshold yellow** *value* global configuration command to specify the difference between the yellow and red thresholds and to configure the yellow threshold. For example, if the red threshold is 66 degrees C and you want to configure the yellow threshold as 51 degrees C, set the difference between the thresholds as 15 by using the **system env temperature threshold yellow 15** command. For example, if the red threshold is 60 degrees C and you want to configure the yellow threshold as 51 degrees C, set the difference between the thresholds as 9 by using the **system env temperature threshold yellow 9** command.



**Note** The internal temperature sensor in the device measures the internal system temperature and might vary  $\pm 5$  degrees C.

## Examples

This example sets 15 as the difference between the yellow and red thresholds:

```
Device(config)# system env temperature threshold yellow 15
Device(config)#
```



## tftp-server

To configure a router or a Flash memory device on the router as a TFTP server, use one of the following **tftp-server** commands in global configuration mode. To remove a previously defined filename, use the **no** form of this command with the appropriate filename.

```
tftp-server [ bootflash | crashinfo | disk0 | flash | null | nvram | rom | system | tmpsys ] { <1-99> | <1300-1999> | alias }
```

```
no tftp-server [ bootflash | crashinfo | disk0 | flash | null | nvram | rom | system | tmpsys ] { <1-99> | <1300-1999> | alias }
```

**Command Default** No default behavior or values.

| Syntax Description |  |   |
|--------------------|--|---|
| <b>bootflash</b>   |  | Specifies TFTP service of a file on a Flash memory device   |
| <b>crashinfo</b>   |  | Collection of useful information related to the current crash stored in bootflash or flash memory.  |
| <b>disk0</b>       |  | Source or destination URL of rotating media.  |
| <b>flash</b>       |  | Specifies TFTP service of a file in Flash memory.   |
| <b>null</b>        |  | Null destination for copies or files. You can copy a remote file to null to determine its size.     |
| <b>nvram</b>       |  | Device's NVRAM.   |
| <b>rom</b>         |  | Specifies TFTP service of a file in ROM.  |
| <b>system</b>      |  | Source or destination URL for system memory, which includes the running configuration.              |
| <b>alias</b>       |  | Specifies an alternate name for the file that the TFTP server uses in answering TFTP Read Requests. |

**Usage Guidelines** You can specify multiple filenames by repeating the **tftp-server** command. The system sends a copy of the system image contained in ROM or one of the system images contained in Flash memory to any client that issues a TFTP Read Request with this filename.

If the specified *filename1* or *filename2* argument exists in Flash memory, a copy of the Flash image is sent. On systems that contain a complete image in ROM, the system sends the ROM image if the specified *filename1* or *filename2* argument is not found in Flash memory.



Images that run from ROM cannot be loaded over the network. Therefore, it does not make sense to use TFTP to offer the ROMs on these images.

If a USB is configured as a TFTP server, it is recommended that all corresponding configurations be removed before physically removing or disabling the USB. The usb option will not be available once the USB is disabled or physically removed.

---

**Command Modes** Global Configuration

---

| <b>Command History</b> | <b>Release</b>               | <b>Modification</b>          |
|------------------------|------------------------------|------------------------------|
|                        | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

---

The following example enables a device to operate as a TFTP server. The source file c3640-i-mz is in the second partition of internal Flash memory:

```
Device (config)# tftp-server flash flash:2:dirt/gate/c3640-i-mz
```

## traceroute mac

To display the Layer 2 path taken by the packets from the specified source MAC address to the specified destination MAC address, use the **traceroute mac** command in privileged EXEC mode.

```
traceroute mac [interface interface-id] source-mac-address [interface interface-id]
destination-mac-address [vlan vlan-id] [detail]
```

### Syntax Description

|                                      |  |
|--------------------------------------|--|
| <b>interface</b> <i>interface-id</i> | (Optional) Specifies an interface on the source or destination device.   |
| <i>source-mac-address</i>            | The MAC address of the source device in hexadecimal format.  |
| <i>destination-mac-address</i>       | The MAC address of the destination device in hexadecimal format.   |
| <b>vlan</b> <i>vlan-id</i>           | (Optional) Specifies the VLAN on which to trace the Layer 2 path that the packets take from the source device to the destination device. Valid VLAN IDs are 1 to 4094. |
| <b>detail</b>                        | (Optional) Specifies that detailed information appears.  |

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

### Usage Guidelines

For Layer 2 traceroute to function properly, Cisco Discovery Protocol (CDP) must be enabled on all of the devices in the network. Do not disable CDP.

When the device detects a device in the Layer 2 path that does not support Layer 2 traceroute, the device continues to send Layer 2 trace queries and lets them time out.

The maximum number of hops identified in the path is ten.

Layer 2 traceroute supports only unicast traffic. If you specify a multicast source or destination MAC address, the physical path is not identified, and an error message appears.

The **traceroute mac** command output shows the Layer 2 path when the specified source and destination addresses belong to the same VLAN.

If you specify source and destination addresses that belong to different VLANs, the Layer 2 path is not identified, and an error message appears.

If the source or destination MAC address belongs to multiple VLANs, you must specify the VLAN to which both the source and destination MAC addresses belong.

If the VLAN is not specified, the path is not identified, and an error message appears.

The Layer 2 traceroute feature is not supported when multiple devices are attached to one port through hubs (for example, multiple CDP neighbors are detected on a port).

When more than one CDP neighbor is detected on a port, the Layer 2 path is not identified, and an error message appears.

This feature is not supported in Token Ring VLANs.

### Examples

This example shows how to display the Layer 2 path by specifying the source and destination MAC addresses:

```
Device# traceroute mac 0000.0201.0601 0000.0201.0201
Source 0000.0201.0601 found on con6[WS-C3750E-24PD] (2.2.6.6)
con6 (2.2.6.6) :Gi0/0/1 => Gi0/0/3
con5          (2.2.5.5      ) :   Gi0/0/3 => Gi0/0/1
con1          (2.2.1.1      ) :   Gi0/0/1 => Gi0/0/2
con2          (2.2.2.2      ) :   Gi0/0/2 => Gi0/0/1
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed
```

This example shows how to display the Layer 2 path by using the **detail** keyword:

```
Device# traceroute mac 0000.0201.0601 0000.0201.0201 detail
Source 0000.0201.0601 found on con6[WS-C3750E-24PD] (2.2.6.6)
con6 / WS-C3750E-24PD / 2.2.6.6 :
      Gi0/0/2 [auto, auto] => Gi0/0/3 [auto, auto]
con5 / WS-C2950G-24-EI / 2.2.5.5 :
      Fa0/3 [auto, auto] => Gi0/1 [auto, auto]
con1 / WS-C3550-12G / 2.2.1.1 :
      Gi0/1 [auto, auto] => Gi0/2 [auto, auto]
con2 / WS-C3550-24 / 2.2.2.2 :
      Gi0/2 [auto, auto] => Fa0/1 [auto, auto]
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed.
```

This example shows how to display the Layer 2 path by specifying the interfaces on the source and destination devices:

```
Device# traceroute mac interface fastethernet0/1 0000.0201.0601 interface fastethernet0/3
0000.0201.0201
Source 0000.0201.0601 found on con6[WS-C3750E-24PD] (2.2.6.6)
con6 (2.2.6.6) :Gi0/0/1 => Gi0/0/3
con5          (2.2.5.5      ) :   Gi0/0/3 => Gi0/0/1
con1          (2.2.1.1      ) :   Gi0/0/1 => Gi0/0/2
con2          (2.2.2.2      ) :   Gi0/0/2 => Gi0/0/1
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed
```

This example shows the Layer 2 path when the device is not connected to the source device:

```
Device# traceroute mac 0000.0201.0501 0000.0201.0201 detail
Source not directly connected, tracing source .....
```

```
Source 0000.0201.0501 found on con5[WS-C3750E-24TD] (2.2.5.5)
con5 / WS-C3750E-24TD / 2.2.5.5 :
      Gi0/0/1 [auto, auto] => Gi0/0/3 [auto, auto]
```

```
con1 / WS-C3550-12G / 2.2.1.1 :
    Gi0/1 [auto, auto] => Gi0/2 [auto, auto]
con2 / WS-C3550-24 / 2.2.2.2 :
    Gi0/2 [auto, auto] => Fa0/1 [auto, auto]
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed.
```

This example shows the Layer 2 path when the device cannot find the destination port for the source MAC address:

```
Device# tracroute mac 0000.0011.1111 0000.0201.0201
Error:Source Mac address not found.
Layer2 trace aborted.
```

This example shows the Layer 2 path when the source and destination devices are in different VLANs:

```
Device# tracroute mac 0000.0201.0601 0000.0301.0201
Error:Source and destination macs are on different vlans.
Layer2 trace aborted.
```

This example shows the Layer 2 path when the destination MAC address is a multicast address:

```
Device# tracroute mac 0000.0201.0601 0100.0201.0201
Invalid destination mac address
```

This example shows the Layer 2 path when source and destination devices belong to multiple VLANs:

```
Device# tracroute mac 0000.0201.0601 0000.0201.0201
Error:Mac found on multiple vlans.
Layer2 trace aborted.
```

# traceroute mac ip

To display the Layer 2 path taken by the packets from the specified source IP address or hostname to the specified destination IP address or hostname, use the **traceroute mac ip** command in privileged EXEC mode.

**traceroute mac ip** {*source-ip-address source-hostname*} {*destination-ip-address destination-hostname*} [**detail**]

| Syntax Description            |   |  |
|-------------------------------|---|--|
| <i>source-ip-address</i>      | The IP address of the source device as a 32-bit quantity in dotted-decimal format.      |  |
| <i>source-hostname</i>        | The IP hostname of the source device.   |  |
| <i>destination-ip-address</i> | The IP address of the destination device as a 32-bit quantity in dotted-decimal format. |  |
| <i>destination-hostname</i>   | The IP hostname of the destination device.  |  |
| <b>detail</b>                 | (Optional) Specifies that detailed information appears.                                 |  |

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

**Usage Guidelines** For Layer 2 traceroute to function properly, Cisco Discovery Protocol (CDP) must be enabled on each device in the network. Do not disable CDP.

When the device detects a device in the Layer 2 path that does not support Layer 2 traceroute, the device continues to send Layer 2 trace queries and lets them time out.

The maximum number of hops identified in the path is ten.

The **traceroute mac ip** command output shows the Layer 2 path when the specified source and destination IP addresses are in the same subnet.

When you specify the IP addresses, the device uses Address Resolution Protocol (ARP) to associate the IP addresses with the corresponding MAC addresses and the VLAN IDs.

- If an ARP entry exists for the specified IP address, the device uses the associated MAC address and identifies the physical path.
- If an ARP entry does not exist, the device sends an ARP query and tries to resolve the IP address. The IP addresses must be in the same subnet. If the IP address is not resolved, the path is not identified, and an error message appears.

The Layer 2 traceroute feature is not supported when multiple devices are attached to one port through hubs (for example, multiple CDP neighbors are detected on a port).

When more than one CDP neighbor is detected on a port, the Layer 2 path is not identified, and an error message appears.

This feature is not supported in Token Ring VLANs.

### Examples

This example shows how to display the Layer 2 path by specifying the source and destination IP addresses and by using the **detail** keyword:

```
Device# tracroute mac ip 2.2.66.66 2.2.22.22 detail
Translating IP to mac .....
2.2.66.66 => 0000.0201.0601
2.2.22.22 => 0000.0201.0201

Source 0000.0201.0601 found on con6[WS-C2950G-24-EI] (2.2.6.6)
con6 / WS-C3750E-24TD / 2.2.6.6 :
    Gi0/0/1 [auto, auto] => Gi0/0/3 [auto, auto]
con5 / WS-C2950G-24-EI / 2.2.5.5 :
    Fa0/3 [auto, auto] => Gi0/1 [auto, auto]
con1 / WS-C3550-12G / 2.2.1.1 :
    Gi0/1 [auto, auto] => Gi0/2 [auto, auto]
con2 / WS-C3550-24 / 2.2.2.2 :
    Gi0/2 [auto, auto] => Fa0/1 [auto, auto]
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed.
```

This example shows how to display the Layer 2 path by specifying the source and destination hostnames:

```
Device# tracroute mac ip con6 con2
Translating IP to mac .....
2.2.66.66 => 0000.0201.0601
2.2.22.22 => 0000.0201.0201

Source 0000.0201.0601 found on con6
con6 (2.2.6.6) :Gi0/0/1 => Gi0/0/3
con5          (2.2.5.5      ) :   Gi0/0/3 => Gi0/1
con1          (2.2.1.1      ) :   Gi0/0/1 => Gi0/2
con2          (2.2.2.2      ) :   Gi0/0/2 => Fa0/1
Destination 0000.0201.0201 found on con2
Layer 2 trace completed
```

This example shows the Layer 2 path when ARP cannot associate the source IP address with the corresponding MAC address:

```
Device# tracroute mac ip 2.2.66.66 2.2.77.77
Arp failed for destination 2.2.77.77.
Layer2 trace aborted.
```

# type

To display the contents of one or more files, use the **type** command in boot loader mode.

**type** *filesystem:/file-url...*

## Syntax Description

*filesystem*: Alias for a file system. Use **flash**: for the system board flash device; use **usbflash0**: for USB memory sticks.

*/file-url...* Path (directory) and name of the files to display. Separate each filename with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

Filenames and directory names are case sensitive.

If you specify a list of files, the contents of each file appear sequentially.

## Examples

This example shows how to display the contents of a file:

```
Device: type flash:image_file_name
version_suffix: universal-122-xx.SEx
version_directory: image_file_name
image_system_type_id: 0x00000002
image_name: image_file_name.bin
ios_image_file_size: 8919552
total_image_file_size: 11592192
image_feature: IP|LAYER_3|PLUS|MIN_DRAM_MEG=128
image_family: family
stacking_number: 1.34
board_ids: 0x00000068 0x00000069 0x0000006a 0x0000006b
info_end:
```

# unset

To reset one or more environment variables, use the **unset** command in boot loader mode.

**unset** *variable...*

## Syntax Description

*variable*

Use one of these keywords for *variable*:

**MANUAL\_BOOT**—Specifies whether the device automatically or manually boots.

**BOOT**—Resets the list of executable files to try to load and execute when automatically booting. If the BOOT environment variable is not set, the system attempts to load and execute the first executable image it can find by using a recursive, depth-first search through the flash: file system. If the BOOT variable is set but the specified images cannot be loaded, the system attempts to boot the first bootable file that it can find in the flash: file system.

**ENABLE\_BREAK**—Specifies whether the automatic boot process can be interrupted by using the **Break** key on the console after the flash: file system has been initialized.

**HELPER**—Identifies the semicolon-separated list of loadable files to dynamically load during the boot loader initialization. Helper files extend or patch the functionality of the boot loader.

**PS1**—Specifies the string that is used as the command-line prompt in boot loader mode.

**CONFIG\_FILE**—Resets the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration.

**BAUD**—Resets the rate in bits per second (b/s) used for the console. The Cisco IOS software inherits the baud rate setting from the boot loader and continues to use this value unless the configuration file specifies another setting.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

| Release                      | Modification                 |
|------------------------------|------------------------------|
| Cisco IOS XE Everest 16.5.1a | This command was introduced. |

## Usage Guidelines

Under typical circumstances, it is not necessary to alter the setting of the environment variables.

The **MANUAL\_BOOT** environment variable can also be reset by using the **no boot manual** global configuration command.

The **BOOT** environment variable can also be reset by using the **no boot system** global configuration command.

The **ENABLE\_BREAK** environment variable can also be reset by using the **no boot enable-break** global configuration command.



The HELPER environment variable can also be reset by using the **no boot helper** global configuration command.

The CONFIG\_FILE environment variable can also be reset by using the **no boot config-file** global configuration command.

### Example

This example shows how to unset the SWITCH\_PRIORITY environment variable:

```
Device: unset SWITCH_PRIORITY
```

# upgrade rom-monitor capsule

To upgrade the read-only memory monitor (ROMMON) by using the capsule method, use the **upgrade rom-monitor capsule** command in privileged EXEC mode.

## Standalone Devices

```
upgrade rom-monitor capsule {golden | primary} [{R0 | RP active}]
```

## Device with High Availability

```
upgrade rom-monitor capsule {golden | primary} [{R0 | R1 | RP {active | standby}}]
```

## Device with StackWise Virtual

```
upgrade rom-monitor capsule {golden | primary} [{R0 | R1 | RP {active | standby} | switch {switch_number | active | standby} {R0 | R1 | RP {active | standby}}}]
```

### Syntax Description

|  |   |
|--|---|
| <b>golden</b>                                    | Specifies the golden ROMMON to be upgraded.   |
| <b>primary</b>                                   | Specifies the primary ROMMON to be upgraded.  |
| <b>R0</b>  | Upgrades the ROMMON of the Route Processor (RP) slot 3.   |
| <b>R1</b>  | Upgrades the ROMMON of the RP slot 4.   |
| <b>RP {active   standby}</b>                     | Upgrades the ROMMON of the RP slot 1 and slot 2. <ul style="list-style-type: none"> <li>• <b>active</b>: Specifies the active instance.</li> <li>• <b>standby</b>: Specifies the standby instance.</li> </ul>   |
| <b>switch {switch_number   active   standby}</b> | Specifies the switch. <ul style="list-style-type: none"> <li>• <i>switch_number</i>: ID of the switch. The range is from 1 to 2.</li> <li>• <b>active</b>: Specifies the active switch.</li> <li>• <b>standby</b>: Specifies the standby switch.</li> </ul> |

### Command Default

This command has no default settings.

### Command Modes

Privileged EXEC (#)

### Command History

| Release                        | Modification  |
|--------------------------------|---|
| Cisco IOS XE Gibraltar 16.12.2 | This command was introduced only on the C9500-12Q, C9500-16X, C9500-24Q, C9500-40X models of the series.  |
| Cisco IOS XE Amsterdam 17.1.1  | The <b>upgrade rom-monitor capsule golden</b> option was introduced on the C9500-24Y4C, C9500-32C, C9500-32QC, and C9500-48Y4C models of the series |

---

**Usage Guidelines**

To know if a ROMMON version upgrade is applicable to a software version, see the release notes of the corresponding software release:

<https://www.cisco.com/c/en/us/support/switches/catalyst-9500-series-switches/products-release-notes-list.html>

On the C9500-12Q, C9500-16X, C9500-24Q, C9500-40X models of the series, you must manually upgrade the golden and primary ROMMON, starting from Cisco IOS XE Gibraltar 16.12.2.

On the C9500-24Y4C, C9500-32C, C9500-32QC, and C9500-48Y4C models of the series, you must manually upgrade the golden ROMMON, starting from Cisco IOS XE Amsterdam 17.1.1. The primary ROMMON is always upgraded automatically if a new version is applicable

---

**Examples**

This example shows how to upgrade the golden ROMMON on a device with StackWise Virtual:

```
Device# upgrade rom-monitor capsule golden switch active R0

This operation will reload the switch and take a few minutes to complete.
Do you want to proceed (y/n)? [confirm]y

Device#

Initializing Hardware .....

!
!
!

Warning : New region (type 2) access rights will be modified

Updating Block at FFFFF000h 100%

Restarting switch to complete capsule upgrade

<output truncated>
```

# version

To display the boot loader version, use the **version** command in boot loader mode.

## **version**

---

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

---

**Command Default** No default behavior or values.

---

**Command Modes** Boot loader

---

| Command History | Release                      | Modification                 |
|-----------------|------------------------------|------------------------------|
|                 | Cisco IOS XE Everest 16.5.1a | This command was introduced. |

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**Examples** This example shows how to display the boot loader version on a device: