



## **Programmability Command Reference, Cisco IOS XE Cupertino 17.7.x**

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## Preface

This preface describes the conventions of this document and information on how to obtain other documentation. It also provides information on what's new in Cisco product documentation.

- [Document Conventions](#) , on page iii
- [Related Documentation](#), on page v
- [Obtaining Documentation and Submitting a Service Request](#), on page v

## Document Conventions

This document uses the following conventions:

Convention	Description
^ or Ctrl	Both the ^ symbol and Ctrl represent the Control (Ctrl) key on a keyboard. For example, the key combination <b>^D</b> or <b>Ctrl-D</b> means that you hold down the Control key while you press the D key. (Keys are indicated in capital letters but are not case sensitive.)
<b>bold font</b>	Commands and keywords and user-entered text appear in <b>bold font</b> .
<i>Italic font</i>	Document titles, new or emphasized terms, and arguments for which you supply values are in <i>italic font</i> .
Courier font	Terminal sessions and information the system displays appear in <code>courier font</code> .
<b>Bold Courier font</b>	<b>Bold Courier font</b> indicates text that the user must enter.
[x]	Elements in square brackets are optional.
...	An ellipsis (three consecutive nonbolded periods without spaces) after a syntax element indicates that the element can be repeated.
	A vertical line, called a pipe, indicates a choice within a set of keywords or arguments.
[x   y]	Optional alternative keywords are grouped in brackets and separated by vertical bars.

Convention	Description
{x   y}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x {y   z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
<>	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

### Reader Alert Conventions

This document may use the following conventions for reader alerts:



**Note** Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



**Tip** Means *the following information will help you solve a problem*.



**Caution** Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



**Timesaver** Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Take note of the following general safety warnings:



---

**Warning** IMPORTANT SAFETY INSTRUCTIONS

Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Read the installation instructions before using, installing, or connecting the system to the power source. Use the statement number at the beginning of each warning statement to locate its translation in the translated safety warnings for this device.

SAVE THESE INSTRUCTIONS



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## Related Documentation



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**Note** Before installing or upgrading the device, refer to the device release notes.

---

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html>

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# Programmability

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# action export-to-telemetry

To export Embedded Event Manager (EEM) variables to telemetry, use the **action export-to-telemetry** command in applet configuration mode. To disable the action of exporting EEM variables to telemetry, use the **no** form of this command.

**action** *label* **export-to-telemetry** [*EEM-variable*]  
**no action** *label*

<b>Syntax Description</b>	<i>label</i>	Unique identifier that can be any string value. Actions are sorted and run in ascending alphanumeric key sequence using the label as the sort key. If the string contains embedded blanks, enclose it in double quotation marks.
	<i>EEM-variable</i>	(Optional) User-defined EEM variable.

## Command Default

Applet configuration (config-applet)

## Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1	This command was introduced.

## Usage Guidelines

The EEM Event Publish capability is part of the Cisco-IOS-XE-ios-events-oper.YANG module for on-change telemetry notifications.

This command exports the event-specific data of the EEM policy using YANG notification to an external telemetry collector. The variables are exported in the *key:value* pair format for the external telemetry collector to use. For example, if the EEM applet script detects a certain percentage of packet loss on an interface, a custom message can be added to notify about the loss.

## Example

This example shows how to export EEM variables to telemetry.

```
Device> enable
Device# configure terminal
Device(config)# event manager applet one
Device(config-applet)# action 1.0 export-to-telemetry
Device(config-applet)#
```

## Related Commands

Command	Description
<b>event manager applet</b>	Registers an event applet with EEM and enters applet configuration mode.

# app-default-gateway

To set the default gateway for an application, use the **app-default-gateway** command in application hosting configuration mode. To remove the default gateway, use the **no** form of this command.

**app-default-gateway** *ip-address* **guest-interface** *network-interface-number*  
**no app-default-gateway** [*{ip-address guest-interface network-interface-number}*]

<b>Syntax Description</b>	<i>ip-address</i>	IP address of the default gateway.
	<b>guest-interface</b> <i>network-interface-number</i>	Configures the guest interface. The <i>network-interface-number</i> maps to the container Ethernet number.
<b>Command Default</b>	The default gateway is not configured.	
<b>Command Modes</b>	Application hosting configuration (config-app-hosting)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

## Example

The following example shows how to set the default gateway for the application:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-default-gateway 10.3.3.31 guest-interface 1
Device(config-app-hosting)#
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.

# app-hosting

To initialize application hosting, use the **app-hosting** command in privileged EXEC mode.

**app-hosting** {**install appid** *application-name* **package** *package-location* } | **activate** | **start** | **stop** | **deactivate** | **uninstall**} **appid** *application-name*

Syntax Description		
<b>install</b>		Installs the application.
<b>appid</b> <i>application-name</i>		Installs the specified application.
<b>package</b> <i>package-location</i>		Installs the application package from the specified location.
<b>activate</b>		Activates the application package.
<b>start</b>		Starts the application by activating the start-up scripts.
<b>stop</b>		Stops the application.
<b>deactivate</b>		Deactivates the application.
<b>uninstall</b>		Uninstalls the application.

**Command Default** Application hosting is not initialized.

**Command Modes** Privileged EXEC (#)

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

**Usage Guidelines** For application hosting to work, IOx services must be configured using the **iox** command. Copy the IOx application to the local device storage medium using the Cisco IOS **copy** command, and enable the **app-hosting install** command to enable application hosting.

Applications can be installed from local storage locations such as, flash, bootflash, usbflash0, usbflash1, and harddisk.

The **activate** keyword validates all application resource requests, and if all requested resources are available, the application is activated; if not, the activation fails.

The **start** keyword executes the application's start-up script, and the **stop** keyword is equivalent to an application shutdown.

While uninstalling the application, all packages and images stored in the system are removed. All changes and updates to the application are also removed.

## Example

The following example shows how to install a third-party application:



```
Device# app-hosting install appid iox_app package flash:my_iox_app.tar
```

**Related Commands**

Command	Description
<code>iox</code>	Configure IOx services.

# app-hosting appid

To configure an application, and to enter application hosting configuration mode, use the **app-hosting appid** command in global configuration mode. To remove the application, use the **no** form of this command.

**app-hosting appid** *application-name*  
**no app-hosting appid** *application-name*

<b>Syntax Description</b>	<i>application-name</i>	Application name.
<b>Command Default</b>	No application is configured.	
<b>Command Modes</b>	Global configuration (config)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
<b>Usage Guidelines</b>	<p>The <i>application name</i> argument can be up to 32 alphanumeric characters.</p> <p>You can update the application hosting configuration, after configuring this command.</p>	

## Example

The following example shows how to configure an application:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device (config-app-hosting)#
```

# app-hosting data appid

To transfer application data contents into an application's persistent data mount, use the **app-hosting data appid** command in privileged EXEC mode.

**app-hosting data appid** *application-name* { **copy** *source-file-path destination-file-path* | **delete** *file-path* }

Syntax Description		
	<i>application-name</i>	Name of the application.
	<b>copy</b>	Copies a file to destination file or directory under the application's shared data.
	<i>source-file-path</i>	The folder where the source file resides.
	<i>destination-file-path</i>	The folder where the file is to be copied.
	<b>delete</b> <i>file-path</i>	Deletes a specified file or directory from the application's shared data.

**Command Default** Application data is not transferred.

**Command Modes** Privileged EXEC (#)

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

**Usage Guidelines** Based on the specified file path, the **delete** keyword can delete either the file or the entire directory.

### Example

The following example shows how to copy an application:

```
Device# app-hosting data appid app docker1 copy bootflash:IOXN.log cfg/IOXN.log
Successfully copied file /flash/IOXN.log to docker1 as cfg/IOXN.log
```

The following example shows how to delete an application:

```
Device# app-hosting data appid app1 delete bootflash:n2os_ids app-data-dir cfg/n2os_ids
```

Related Commands	Command	Description
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.

# app-hosting settings appid

To enable the settings of an application, use the **app-hosting settings appid** command in privileged EXEC mode.

**app-hosting settings appid** *application-name***file** *file-path*

Syntax Description		
	<i>application-name</i>	Name of the application.
	<b>file</b> <i>file-path</i>	Specifies the file that contains the application settings.

**Command Default** Application settings are not enabled.

**Command Modes** Privileged EXEC (#)

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

## Example

The following example shows how to enable the settings of an application:

```
Device# app-hosting settings appid app1 file bootflash:n2os_ids app-data-dir cfg/n2os_ids
```

## Related Commands

Command	Description
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.

# app-resource docker

To enable the configuration of runtime Docker options, use the **app-resource docker** command in application hosting configuration mode. To disable the configuration of runtime Docker options, use the **no** form of this command.

**app-resource docker**  
**no app-resource docker**

This command has no arguments or keywords.

### Command Default

Runtime options are disabled.

### Command Modes

Application hosting configuration mode (config-app-hosting)

### Command History

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

### Usage Guidelines

When you configure the **app-resource docker** command, the command mode changes to application-hosting docker configuration mode.

### Example

The following example shows how to configure the **app-resource docker** command:

```
Device> enable
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-resource docker
Device(config-app-hosting-docker)#
```

### Related Commands

Command	Description
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.

# app-resource profile

To override the application-provided resource profile, use the **app-resource profile** command in application hosting configuration mode. To revert to the application-specified resource profile, use the **no** form of this command.

**app-resource profile** *profile-name*  
**no app-resource profile** {[*profile-name*]}

<b>Syntax Description</b>	<i>profile-name</i>	Name of the resource profile.
<b>Command Default</b>	Resource profile is configured.	
<b>Command Modes</b>	Application hosting configuration (config-app-hosting)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
<b>Usage Guidelines</b>	Reserved resources specified in the application package can be changed by setting a custom resource profile. Only the CPU, memory, and virtual CPU (vCPU) resources can be changed. For the resource changes to take effect, stop and deactivate the application, then activate and start it again.	



**Note** Only custom profile is supported.

The command configures the custom application resource profile, and enters custom application resource profile configuration mode.

## Example

The following example shows how to change the allocation of resources of an application:

```
Device# configure terminal
Device(config)# application-hosting appid iox_app
Device(config-app-hosting)# app-resource profile custom
Device(config-app-resource-profile-custom)#
```

Command	Description
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.

# app-vnic gateway



**Note** This command is supported only on routing platforms. It is not supported on switching platforms.

To configure a virtual network interface gateway for an application, use the **app-vnic gateway** command in application hosting configuration mode. To remove the configuration, use the **no** form of this command.

```
app-vnic gateway virtualportgroup ip-address guest-interface network-interface-number
no app-vnic gateway [{virtualportgroup ip-address guest-interface network-interface-number}]
```

<b>Syntax Description</b>	<b>virtualportgroup</b> <i>number</i>	Configures a VirtualPortGroup interface for the gateway.
	<b>guest-interface</b> <i>network-interface-number</i>	Configures a guest interface for the gateway.

**Command Default** The virtual network gateway is not configured.

**Command Modes** Application hosting configuration (config-app-hosting)

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

**Usage Guidelines** After you configure the virtual network interface gateway for an application, the command mode changes to application-hosting gateway configuration mode. In this mode, you can configure the IP address of the guest interface.

### Example

The following example shows how to configure the management gateway of an application:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-vnic gateway1 virtualportgroup 0 guest-interface 1
Device(config-app-hosting-gateway)# guest-ipaddress 10.0.0.3 netmask 255.255.255.0
Device(config-app-hosting-gateway)#
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>guest-ipaddress</b>	Configures an IP address for the guest interface.

# app-vnic AppGigabitEthernet

To configure the front-panel port for application hosting, use the **app-vnic AppGigabitEthernet** command in application hosting configuration mode. To remove a front-panel port, use the **no** form of this command.

```
app-vnic AppGigabitEthernet {access | trunk}
no app-vnic AppGigabitEthernet {access | trunk}
```

<b>Syntax Description</b>	<b>access</b>	Configures.
	<b>trunk</b>	Configures the front-panel trunk port for application hosting.
<b>Command Default</b>	Front-panel ports are not configured for application hosting.	
<b>Command Modes</b>	Application hosting configuration (config-app-hosting)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

**Usage Guidelines**

Cisco Catalyst 9300 Series Switches support front-panel trunk ports for application hosting.

You can configure the front-panel port as either a trunk interface or a VLAN-specific interface. When using as a trunk interface, the front-panel port is extended to work as a Layer 2 trunk port, and all traffic received by the port is available to the application. When using the port as a VLAN interface, the application is connected to a specific VLAN network. A VLAN interface is created on the host and it is associated with the front-panel port *eth0* interface.

## Example

The following example shows how to configure the front-panel trunk port for application hosting:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-vnic AppGigabitEthernet trunk
Device(config-config-app-hosting-trunk)#
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.



# app-vnic management

To configure the management gateway of the virtual network interface, use the **app-vnic management** command in application hosting configuration mode. To remove the configuration, use the **no** form of this command.

**app-vnic management guest-interface** *network-interface-number*  
**no app-vnic management** [{**guest-interface** *network-interface-number*}]

<b>Syntax Description</b>	<b>guest-interface</b> <i>network-interface-number</i>	Configures a guest interface for the gateway.
---------------------------	--	---

<b>Command Default</b>	Management gateway is not configured.	
------------------------	---------------------------------------	--

<b>Command Modes</b>	Application hosting configuration (config-app-hosting)	
----------------------	--	--

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

**Usage Guidelines** After you configure the management gateway of an application, the command mode changes to application-hosting management-gateway configuration mode. In this mode, you can configure the IP address of the guest interface.

### Example

The following example shows how to configure the management gateway of an application:

```
Device# configure terminal
Device(config)# app-hosting appid lxc_app
Device(config-app-hosting)# app-vnic management guest-interface 0
Device(config-app-hosting-mgmt-gateway)# guest-ipaddress 172.19.0.24 netmask 255.255.255.0
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>guest-ipaddress</b>	Configures an IP address for the guest interface.

# boot ipxe

To configure iPXE boot, use the **boot ipxe** command in global configuration mode. To disable the configuration, use the **no** form of this command.

```
boot ipxe {forever | timeout seconds} switch switch-number
no boot ipxe {forever | timeout seconds} switch switch-number
```

Syntax Description	Parameter	Description
	<b>forever</b>	Attempts iPXE boot forever.
	<b>timeout</b> <i>seconds</i>	Configures a timeout in seconds for iPXE network boot. Valid values are from 1 to 2147483647.
	<b>switch</b> <i>switch-number</i>	Enables iPXE boot for switches in the stack. Valid values are from 0 to 9.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.2	This command was introduced on Cisco Catalyst 3650 and 3850 Series Switches.
	Cisco IOS XE Everest 16.6.1	This command was implemented on Cisco Catalyst 9300 and 9500 Series Switches

**Usage Guidelines** iPXE is an open source implementation of the Preboot eXecution Environment (PXE). Bootloaders boot an image located on a File Transfer Protocol (FTP), Hypertext Transfer Protocol (HTTP), or Trivial File Transfer Protocol (TFTP) server.

If the **forever** keyword is configured, the switch sends Dynamic Host Configuration Protocol (DHCP) requests forever. If the **timeout** keyword is configured, DHCP requests are sent for the specified amount of time, and when the timeout expires, the switch reverts to device boot.

## Example

The following example shows how to configure an iPXE boot timeout for switch 2:

```
Device(config)# boot ipxe timeout 240 switch 2
```

# boot manual

To configure manual boot, use the **boot manual** command in global configuration mode. To remove the configuration, use the **no** form of this command.

```
boot manual switch switch-number
no boot manual switch switch-number
```

---

## Syntax Description

**switch** *switch-number* Configures manual boot for the switches in the stack.

---

## Command Default

Manual boot is enabled.

## Command Modes

Global configuration (config)

---

## Command History

Release	Modification
Cisco IOS XE Denali 16.3.2	This command was introduced on Cisco Catalyst 3650 and 3850 Series Switches.
Cisco IOS XE Everest 16.6.1	This command was implemented on Cisco Catalyst 9300 and 9500 Series Switches

---

## Usage Guidelines

When manual boot is disabled, and the switch reloads, the boot process starts automatically. When manual boot is disabled, the bootloader determines whether to execute a device boot or a network boot based on the configured value of the iPXE ROMMON variable.

## Example

The following example shows how to configure manual boot for switch 2:

```
Device(config)# boot manual switch 2
```

# boot system

To enable a system image boot, use the **boot system** command in global configuration mode. To disable the configuration, use the **no** form of this command.

**boot system switch** {*all number*} {**flash:** | **ftp:** | **http:** | **tftp:**}

**no boot system** [{**switch** | {*all number*}}] [{**flash:** | **ftp:** | **http:** | **tftp:**}

Syntax Description		
	<b>flash:</b>	Specifies the flash filesystem to boot an image.
	<b>ftp:</b>	Specifies a File Transfer Protocol (FTP) location to boot an image.
	<b>http:</b>	Specifies a Hypertext Transfer Protocol (HTTP) location to boot an image.
	<b>tftp:</b>	Specifies a Trivial File Transfer Protocol (TFTP) location to boot an image.
	<b>switch</b> <i>number</i>	Enables booting for switches in a stack. Valid values are from 0 to 9.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.2	This command was introduced on Cisco Catalyst 3650 and 3850 Series Switches.
	Cisco IOS XE Everest 16.6.1	This command was implemented on Cisco Catalyst 9300 and 9500 Series Switches

**Usage Guidelines** You can either use an IPv4 or an IPv6 address for the remote FTP/HTTP/TFTP servers. When using an IPv6 address, you must enter the IPv6 address inside square brackets (as per RFC 2732); otherwise, the device will not boot.



**Note** IPv6 is not supported on Catalyst 9000 Series Switches.

## Example

The following example shows how to boot an image from an IPv4 HTTP server:

```
Device(config)# boot system switch 1 http://192.0.2.42/image-filename
```

The following example shows how to boot an image from an IPv6 HTTP server:

```
Device(config)# boot system switch 1 http://[2001:db8::1]/image-filename
```

# clear configuration lock

To clear the configuration session lock, use the **clear configuration lock** in privileged EXEC mode.

**clear configuration lock**

This command has no arguments or keywords.

---

**Command Default** Session lock times out after 10 minutes.

---

**Command Modes** Privileged EXEC (#)

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Release Fuji 16.8.1	This command was introduced.

---

---

**Usage Guidelines** Use this command to remove the configuration lock on a session. A full synchronization of the database is triggered when a lock is cleared.

Read operation is allowed by any NETCONF/RESTCONF sessions during the global lock. However, write operation is only allowed by the NETCONF session that owns the lock.

## Example

The following example shows how to clear a configuration lock:

```
Device# clear configuration lock
```

# clear netconf-yang session

To clear NETCONF-YANG sessions, use the **clear netconf-yang session** command in privileged EXEC mode.

```
clear netconf-yang session session-id
[R0 | R1 | RP {active | standby}]
```

Syntax Description		
<i>session-id</i>		Clears the specified session. Valid values are from 1 to 4294967295.
<b>R0</b>		(Optional) Clears the Route Processor (RP) slot 0.
<b>R1</b>		(Optional) Clears the RP slot 1.
<b>RP</b>		(Optional) Clears the RP.
<b>active</b>		(Optional) Clears the active instance of the RP.
<b>standby</b>		(Optional) Clears the standby instance of the RP.

**Command Modes** Privileged EXEC (#)

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

**Usage Guidelines** You can use this command to unlock a datastore by killing the locked session that has the ownership of the datastore lock. When a global lock is cleared by using the **clear netconf-yang session** command, a full synchronization of the datastore is triggered. However; clearing a session while the global lock is in place, only schedules a full synchronization.

## Examples

The following example shows how to clear a NETCONF-YANG session:

```
Device# clear netconf-yang session 2 RP active
```

# clear telemetry ietf subscription

To clear dynamic subscriptions, use the **clear telemetry ietf subscription** command in privileged EXEC mode.

**clear telemetry ietf subscription** *subscription-ID*

<b>Syntax Description</b>	<i>subscription-ID</i>	Dynamic subscription ID.
<b>Command Default</b>	Subscriptions are not cleared.	
<b>Command Modes</b>	Privileged EXEC (#)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

**Usage Guidelines**

You can delete dynamic subscriptions by using the **clear telemetry ietf subscription** command, the <kill-subscription> RPC, and the in-band <delete subscription> RPC.

A subscription is also deleted when the parent NETCONF session is torn down or disconnected. If the network connection is interrupted, it may take some time for the SSH/NETCONF session to timeout, and subsequent subscriptions to be removed.

## Example

The following sample output displays all subscriptions:

```
Device# show telemetry ietf subscription all

Telemetry subscription brief

ID              Type      State      Filter type
-----
2147483648     Dynamic  Valid      xpath
2147483649     Dynamic  Valid      xpath
```

The following example shows how to clear dynamic subscriptions:

```
Device# clear telemetry ietf subscription 2147483648
```

The following sample output displays all available subscriptions:

```
Device# show telemetry ietf subscription all

Telemetry subscription brief

ID              Type      State      Filter type
-----
2147483649     Dynamic  Valid      xpath
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show telemetryietf subscription</b>	Display information about telemetry subscriptions on a device.
<b>telemetry ietf subscription</b>	Creates a telemetry subscription and enters telemetry-subscription mode.



# controller (OpenFlow)

Effective with Cisco IOS XE Cupertino 17.7.1, the **controller** command is not available in Cisco IOS XE software.

To connect to an OpenFlow controller, use the **controller** command in OpenFlow switch configuration mode. To disconnect an OpenFlow controller, use the **no** form of this command.

**controller ipv4** *controller-address* [**port** [*port-number*]][**security** {**none** | **tls**}}][**vrf** [*vrf-name*]]  
**no controller ipv4** *controller-address* [**port** [*port-number*]][**security** {**none** | **tls**}}][**vrf** [*vrf-name*]]

## Syntax Description

<b>ipv4</b> <i>controller-address</i>	Configures the IP address of the OpenFlow controller.
<b>port</b> <i>port-number</i>	(Optional) Configures the OpenFlow controller TCP port. The default is 6653.
<b>security</b>	(Optional) Configures the OpenFlow controller connection security.
<b>none</b>	(Optional) Configures no authentication or encryption for the controller.
<b>tls</b>	(Optional) Configures the Transport Layer Security (TLS) protocol for the controller.
<b>vrf</b> <i>vrf-name</i>	(Optional) Configures a virtual routing and forwarding (VRF) instance for the OpenFlow controller.

## Command Default

The controller is not configured.

## Command Modes

OpenFlow switch configuration (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Usage Guidelines

The OpenFlow controller is an entity that interacts with the OpenFlow switch using the OpenFlow protocol. In most cases, an OpenFlow controller is a software that controls many OpenFlow logical switches. OpenFlow controllers offer a centralized view of the network, and enable administrators to dictate to the underlying systems (switches and routers) on how to handle the network traffic. Up to 8 controllers are supported.

### Example

The following example shows how to configure an OpenFlow controller:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# controller ipv4
10.2.2.2 port 6633 vrf Mgmt-vrf security none
```

### Related Commands

Command	Description
<b>feature openflow</b>	Enables the OpenFlow feature.
<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
<b>switch</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# cpu (App Hosting)

To change the CPU quota/unit allocated for an application, use the **cpu** command in custom application resource profile configuration mode. To revert to the application-provided CPU quota, use the **no** form of this command.

**cpu** *unit*  
**no** **cpu** [*{unit}*]

<b>Syntax Description</b>	<i>unit</i>	CPU quota to be allocated for an application. Valid values are from 0 to 20000.
---------------------------	-------------	---

**Command Default** Default CPU depends on the platform.

**Command Modes** Custom application resource profile configuration (config-app-resource-profile-custom)

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Fuji 16.9.1	This command was introduced.

**Usage Guidelines** A CPU unit is the minimal CPU allocation by the application. Total CPU units is based on normalized CPU units measured for the target device.

Within each application package, an application-specific resource profile is provided that defines the recommended CPU load, memory size, and number of virtual CPUs (vCPUs) required for the application. Use this command to change the allocation of resources for specific processes in the custom resource profile.

Reserved resources specified in the application package can be changed by setting a custom resource profile. Only the CPU, memory, and vCPU resources can be changed. For the resource changes to take effect, stop and deactivate the application, then activate it and start it again.



**Note** Resource values are application-specific, and any adjustment to these values must ensure that the application can run reliably with the changes.

## Examples

The following example shows how to override the application-provided CPU quota using a custom resource profile:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-resource profile custom
Device(config-app-resource-profile-custom)# cpu 7400
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.

Command	Description
<b>app-resource profile</b>	Overrides the application-provided resource profile.

# datapath-id

Effective with Cisco IOS XE Cupertino 17.7.1, the **datapath-id** command is not available in Cisco IOS XE software.

To set the OpenFlow logical switch ID, use the **datapath-id** command in OpenFlow switch configuration mode. To disable the logical switch ID, use the **no** form of this command.

**datapath-id** *value*  
**no datapath-id**

**Syntax Description**

*value* A 64-bit hexadecimal value in the range 0x1 to 0xffffffffffff.

**Command Default**

Datapath ID is not configured.

**Command Modes**

OpenFlow switch configuration mode (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

**Example**

The following example shows how to configure a logical switch ID:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# datapath 0x12345678
```

**Related Commands**

Command	Description
<b>feature openflow</b>	Enables the OpenFlow feature.
<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
<b>switch</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# dataplane-default

Effective with Cisco IOS XE Cupertino 17.7.1, the **dataplane-default** command is not available in Cisco IOS XE software.

To set the OpenFlow configuration in the dataplane, use the **dataplane-default** command in OpenFlow switch configuration mode. To disable the settings, use the **no** form of this command.

**dataplane-default** {secure | standalone}  
**no dataplane-default** {secure | standalone}

Syntax Description		
	<b>secure</b>	Configures the dropping of packets that are intended to the controller. This is the default.
	<b>standalone</b>	Configures the forwarding of packets that are intended to the controller.

**Command Default**      Packets are dropped.

**Command Modes**      OpenFlow switch configuration (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following example shows how to configure the dropping of packets that are intended for the controller:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# dataplane-default secure
```

Related Commands	Command	Description
	<b>feature openflow</b>	Enables the OpenFlow feature.
	<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
	<b>switch(OpenFlow)</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# debug netconf-yang

To log NETCONF-YANG debug messages, use the **debug netconf-yang** command in privileged EXEC mode.

```
debug netconf-yang [{level {debug | emergency | error | info | noise | notice | verbose | warning}}]
```

```
no debug netconf-yang [{level {debug | emergency | error | info | noise | notice | verbose | warning}}]
```

## Syntax Description

<b>level</b>	(Optional) Specifies the log level of NETCONF-YANG processes.
<b>debug</b>	(Optional) Logs debug messages.
<b>emergency</b>	(Optional) Logs emergency messages.
<b>error</b>	(Optional) Logs error messages.
<b>info</b>	(Optional) Logs information messages.
<b>noise</b>	(Optional) Specifies the maximum log level setting. This setting includes all logs in the output such as, emergency, alert, critical, error, warning, notice, debug, verbose and so on.
<b>notice</b>	(Optional) Logs notice messages.
<b>verbose</b>	(Optional) Logs debug messages in detail.
<b>warning</b>	(Optional) Logs warning messages.

## Command Default

Debug logs are not enabled.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1	This command was introduced.

## Usage Guidelines

The last enabled debug logging level is used for logging debug messages. For example, if **warning** level is enabled by NETCONF-YANG, and it is followed by **debug** level by RESTCONF; then debug messages are logged.

The last enabled debug logging level will remain persistent for data model interface (DMI) processes.

## Examples

The following is sample output from the **debug netconf-yang level debug** command:

```
Device# debug netconf-yang level debug
```

```
Jan 24 13:33:20.441 EST: yang-infra: netconf-yang server log level set to debug
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>debug netconf-yang diagnostics</b>	Enables the debugging of NETCONF-YANG diagnostics.



# debug netconf-yang diagnostics

To enable the debugging of NETCONF-YANG diagnostics, use the **debug netconf-yang diagnostics** command in privileged EXEC mode.

```
debug netconf-yang diagnostics diag-level { basic | maximum }
no debug netconf-yang diagnostics diag-level { basic | maximum }
```

<b>Syntax Description</b>	<b>diag-level</b>	Specifies the level for the NETCONF-YANG diagnostics debugging.
	<b>basic</b>	Enables the debugging of diagnostics information that contains data model interface (DMI) logs, ConfD logs, and rollback logs.
	<b>maximum</b>	Enables the debugging of all diagnostic information, and the running configuration snapshots.
<b>Command Default</b>	Diagnostic debugs are not enabled.	
<b>Command Modes</b>	Privileged EXEC (#)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Bengaluru 17.5.1 This command was introduced.	

## Example

The following example shows how to enable basic diagnostic debug messages:

```
Device> enable
Device# debug netconf-yang diagnostics diag-level basic

Diagnostic debugging is on
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>debug netconf-yang</b>	Logs NETCONF-YANG debug messages.
	<b>show platform software yang-management process state</b>	Displays the NETCONF-YANG process states.

# debug restconf

To log RESTCONF debug messages, use the **debug restconf** command in privileged EXEC mode.

```
debug restconf [{level {debug | emergency | error | info | noise | notice | verbose | warning}}]
```

```
no debug restconf [{level {debug | emergency | error | info | noise | notice | verbose | warning}}]
```

## Syntax Description

<b>level</b>	(Optional) Specifies the log level of RESTCONF processes.
<b>debug</b>	(Optional) Logs debug messages.
<b>emergency</b>	(Optional) Logs emergency messages.
<b>error</b>	(Optional) Logs error messages.
<b>info</b>	(Optional) Logs information messages.
<b>noise</b>	(Optional) Specifies the maximum log level setting. This setting includes all logs in the output such as, emergency, alert, critical, error, warning, notice, debug, verbose and so on.
<b>notice</b>	(Optional) Logs notice messages.
<b>verbose</b>	(Optional) Logs debug messages in detail.
<b>warning</b>	(Optional) Logs warning messages.

## Command Default

Debug logs are not enabled.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1	This command was introduced.

## Usage Guidelines

The last enabled debug logging level will be used for logging debug messages. For example, if **warning** level is enabled by NETCONF-YANG, and it is followed by **debug** level by RESTCONF; then debug level messages will be logged.

The last enabled debug logging level will remain persistent for data model interface (DMI) processes.

## Examples

The following is sample output from the **debug restconf** command:

```
Device# debug restconf

Device# show debug

IOSXE Conditional Debug Configs:

Conditional Debug Global State: Stop

IOSXE Packet Tracing Configs:
```

```
license policy manager client:  
  platform software policy_manager_error debugging is on
```

```
Packet Infra debugs:
```

```
Ip Address                                     Port  
-----|-----
```

```
netconf-yang:  
  netconf-yang debugging is on at level debug
```

```
restconf:  
  restconf debugging is on at level debug
```

# default boot

To modify the default boot system parameters, use the **default boot** command in global configuration mode.

```
default boot {ipxe {forever | timeout | seconds} | manual | system {flash: | ftp: | http: | tftp:}} switch number
```

Syntax Description		
<b>ipxe</b>		Enables iPXE boot.
<b>forever</b>		Attempts iPXE boot forever.
<b>timeout</b> <i>seconds</i>		Configures a boot timeout in seconds. Valid values are from 1 to 2147483647.
<b>manual</b>		Enables manual boot.
<b>system</b>		Enables a system image boot.
<b>flash:</b>		Specifies the flash filesystem to boot an image.
<b>ftp:</b>		Specifies an File Transfer Protocol (FTP) location to boot an image.
<b>http:</b>		Specifies an Hypertext Transfer Protocol (HTTP) location to boot an image.
<b>tftp:</b>		Specifies a Trivial File Transfer Protocol (TFTP) location to boot an image.
<b>switch</b> <i>number</i>		Enables booting for switches in a stack. Valid values are from 0 to 9.

**Command Default** Device boot is enabled.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.2	This command was introduced on Cisco Catalyst 3650 and 3850 Series Switches.
	Cisco IOS XE Everest 16.6.1	This command was implemented on Cisco Catalyst 9300 and 9500 Series Switches

**Usage Guidelines** You can either use the **no boot ipxe** or the **default boot ipxe** command to configure device boot.

If the **forever** keyword is configured, the switch sends Dynamic Host Configuration Protocol (DHCP) requests forever. If the **timeout** keyword is configured, DHCP requests are sent for the specified amount of time, and when the timeout expires, the switch reverts to device boot.

## Examples

The following example shows how to enable the default boot mode:

```
Device(config)# default boot ipxe
```

# dig

To do a lookup of the Domain Name System (DNS) server, use the **dig** command in rommon mode.

**dig** *hostname* {*v4 v6*} [*{dns-server-address}*]

Syntax Description		
	<i>hostname</i>	DNS host name
	<i>v4</i>	IPv4 address.
	<i>v6</i>	IPv6 address.
	<i>dns-server-address</i>	(Optional) DNS Server IP address.

<b>Command Modes</b>	Rommon
----------------------	--------

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

**Usage Guidelines** This command does a look up of the DNS name and displays the IP/IPv6 address of the DNS server.

## Example

The following is sample output from the **dig hostname** command:

```
Device: dig example.org

DNS lookup using 2001:DB8::1
addr = 2001:DB8:0000:0000:0000:0000:0001
```

The following is sample output from the **dig hostname v4** command:

```
Device: dig example.org v4

DNS lookup using 10.29.27.5
addr = 172.16.0.1
```

The following is sample output from the **dig hostname v4 dns-server-address** command:

```
Device: dig example.org v4 10.29.27.5

DNS lookup using 10.29.27.5
addr = 172.16.0.1
```

The following is sample output from the **dig hostname v6** command:

```
Device: dig example.org v6

DNS lookup using 2001:DB::1
addr = 2001:DB8:0000:0000:0000:0000:0001
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>net-debug</b>	Displays or changes the network debug values.

# enable (App Hosting)

To enable the AppGigabitEthernet port, use the **enable** command in interface configuration mode. To disable the port, use the **no** form of this command.

**enable**

**no enable**

This command has no arguments or keywords.

---

**Command Default**

The AppGigabitEthernet port is not enabled.

---

**Command Modes**

Interface configuration (config-if)

---

**Command History**

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced on Cisco Catalyst 9410 Series Switches.

---

**Usage Guidelines**

---

**Note** This command is supported only on Cisco Catalyst 9410 Series Switches

---

In a high availability setup, we recommend that you configure the **enable** command on both the AppGigabitEthernet interface ports.

**Example**

The following example shows how to enable the AppGigabitEthernet interface:

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

# encoding

To configure telemetry encoding for a subscription, use the **encoding** command in telemetry-subscription configuration mode.

**encoding** { **encode-kvgpb** | **encode-tdl** }

Syntax Description	
<b>encode-kvgpb</b>	Configures Key-value Google Protocol Buffers (kvGPB) encoding.
<b>encode-tdl</b>	Configures TDL encoding.

**Command Modes** Telemetry-subscription configuration (config-mdt-sub)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	Cisco IOS XE Bengaluru 17.6.1	This command was modified. The <b>encode-tdl</b> keyword was added.

## Example

The following example shows how to configure telemetry encoding for a subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-sub)# encoding encode-kvGPB
```

Related Commands	Command	Description
	<b>telemetry ietf subscription</b>	Configures telemetry subscription.



# feature openflow

Effective with Cisco IOS XE Cupertino 17.7.1, the **feature openflow** command is not available in Cisco IOS XE software.

To enable the OpenFlow feature, use the **feature openflow** command in global configuration mode. To disable the OpenFlow feature, use the **no** form of this command.

**feature openflow**  
**no feature openflow**

This command has no arguments or keywords.

**Command Default** OpenFlow is not configured.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.1	This command was introduced.
	Cisco IOS XE Cupertino 17.7.1	This command was removed.

**Usage Guidelines** Before configuring this command, you must configure the **boot mode openflow** command to enable OpenFlow forwarding mode on your device.

## Example

The following example shows how to enable the OpenFlow configuration:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)#
```

Related Commands	Command	Description
	<b>boot mode openflow</b>	Enables OpenFlow forwarding mode.

# filter

To configure a filter, use the **filter** command in telemetry-subscription configuration mode.

```
filter { nested-uri | tdl-transform | tdl-uri | xpath } filter
```

## Syntax Description

<b>nested-uri</b>	Configures a nested uniform resource identifier (URI) filter.
<b>tdl-transform</b>	Configures a top-level domain (TDL) transform filter.
<b>tdl-uri</b>	Configures a TDL URI filter.
<b>xpath</b>	Configures an XPath filter.
<i>path</i>	Specifies XPath filter.

## Command Modes

Telemetry-subscription configuration (config-mdt-subs)

## Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	This command was modified. The <b>nested-uri</b> , <b>tdl-transform</b> , and <b>tdl-uri</b> keywords were added.

## Usage Guidelines

The set of events from a stream are filtered. Different filter types are used for different stream types. Cisco IOS XE supports the yang-push stream.

The dataset within the yang-push stream to be subscribed to is specified by the use of an XPath filter.

## Example

The following example shows how to configure XPath filter for subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# filter xpath /memory-ios-xe-oper:memory-statistics/memory-statistic
```

## Related Commands

Command	Description
<b>telemetry ietf subscription</b>	Configures telemetry subscription.

# gnxi

To enable the Google Remote Procedure Call (gRPC) Network Operations Interface (gNOI) or gNxI tools, use the **gnxi** command in global configuration mode. To disable gNOI, use the **no** form of this command.

```
gnxi [{ port port-number | secure-allow-self-signed-trustpoint | secure-client-auth | secure-init
| secure-password-auth | secure-peer-verify-trustpoint trustpoint-name | secure-port port-number
| secure-server | secure-trustpoint trustpoint-name | server }]
```

```
no gnxi [{ port [{ port-number }] | secure-allow-self-signed-trustpoint | secure-client-auth |
secure-init | secure-password-auth | secure-peer-verify-trustpoint [{ trustpoint-name }] | secure-port
[{ port-number }] | secure-server | secure-trustpoint [{ trustpoint-name }] | server }][{ grpcunnel
target {[GNMI_GNOI] | [GNMI_GNOI_INSECURE]}][{ grpcunnel destination {[address] | [port]
| [enable] | [identity-trustpoint] | [insecure] | [source-address] | [source-vrf] } }]
```

**Syntax Description**

<b>port</b> <i>port-number</i>	(Optional) Specifies the gNMI port number. Valid values for the <i>port-number</i> argument are from 1024 to 65535.
<b>secure-allow-self-signed-trustpoint</b>	(Optional) Allows the gNMI secure server to use a self-signed certificate.
<b>secure-client-auth</b>	(Optional) Sets the gNMI client authentication.
<b>secure-init</b>	(Optional) Enables the gNMI secure server by using the primary self-signed certificate.
<b>secure-password-auth</b>	(Optional) Sets the gNMI password authentication.
<b>secure-peer-verify-trustpoint</b> <i>trustpoint-name</i>	(Optional) Sets the gNMI server peer validation for the specified trustpoint.
<b>secure-port</b> <i>port-number</i>	(Optional) Sets the gNMI secure server port. Valid values for the <i>port-number</i> argument are from 1024 to 65535.
<b>secure-server</b>	(Optional) Enables the gNMI secure server.
<b>secure-trustpoint</b> <i>trustpoint-name</i>	(Optional) Sets the gNMI server certificate trustpoint.
<b>server</b>	(Optional) Enables the gNMI server.

---

**grpctunnel target***GNMI\_GNOI | GNMI\_GNOI\_INSECURE*

- **GNMI\_GNOI**—gNxI Service. For more information, see [Github](#).
- **GNMI\_GNOI\_INSECURE**—gNxI Service without TLS. For more information, see [Github](#).

---

**grpctunnel destination**

*address | port | enable | identity-trustpoint | insecure | source-address | source-vrf*

- **address**—Specify the tunnel server/destination address. Both IPv4 and IPv6 are supported. No FQDN.
- **port**—Specify the destination port.
- **enable**—Enables the destination.
- **identity-trustpoint**—The certificate to use in the TLS handshake when connecting to the tunnel server or destination.
- **insecure**—Disables TLS on the tunnel. Ignores the **identity-trustpoint** configuration.
- **source-address**—Sets the outgoing source address to use when connecting to the tunnel server or destination.
- **source-vrf**—Sets the outgoing VRF when connecting to the tunnel server or destination.

---

**Command Default**

gNXI is not configured.

---

**Command Modes**

Global configuration (config)

---

**Command History**

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced. This command replaces the <b>gnmi-yang</b> command.
Cisco IOS XE Dublin 17.11.1	The <b>grpctunnel target</b> keyword was introduced.

The following example shows how to start the gNxI process.

```
Device> enable
Device# configure terminal
Device(config)# gnxi
Device
```

**Related Commands**

Command	Description
<b>show gnxi state detail</b>	Displays the status of gNMI interfaces.

## guest-interface (App Hosting)

To configure a guest interface for the front-panel trunk port, use the **guest-interface** command in application-hosting trunk configuration mode. To remove a guest interface, use the **no** form of this command.

```

guest-interface interface-number
no guest-interface interface-number
  
```

<b>Syntax Description</b>	<i>interface-number</i>	Guest interface number. Valid values are from 0 to 63.
<b>Command Default</b>	A guest interface is not configured.	
<b>Command Modes</b>	Application-hosting trunk configuration (config-config-app-hosting-trunk)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
<b>Usage Guidelines</b>	When you configure the front-panel trunk port for application hosting, the command mode changes to application-hosting trunk configuration mode. Configure the <b>guest-interface</b> command in this mode.	

### Example

The following example shows how to configure a guest-interface for a front-panel trunk port:

```

Device# configure terminal
Device(config)# app-hosting appid lxc_app
Device(config-app-hosting)# app-vnic AppGigEthernet trunk
Device(config-config-app-hosting-trunk)# guest-interface 9
Device(config-config-app-hosting-trunk)# end
  
```

Related Commands	Command	Description
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>app-vnic AppGigEthernet trunk</b>	Configures the front-panel trunk port for application hosting, and enters application-hosting trunk configuration mode.

## guest-ipaddress (App Hosting)

To configure an IP address for a guest interface, use the **guest-ipaddress** command in application-hosting gateway, application-hosting management-gateway, or application-hosting VLAN-access IP configuration modes. To remove the guest interface IP address, use the **no** form of this command.

```
guest-ipaddress ip-address netmask netmask
no guest-ipaddress [{ip-address netmask netmask}]
```

<b>Syntax Description</b>	<i>ip-address</i>	IP address of the guest interface.
	<b>netmask</b> <i>netmask</i>	Specifies the subnet mask for the guest IP address.
<b>Command Default</b>	The guest interface IP address is not configured.	
<b>Command Modes</b>	Application-hosting gateway configuration (config-app-hosting-gateway)	
	Application-hosting management-gateway configuration (config-app-hosting-mgmt-gateway)	
	Application-hosting VLAN-access IP configuration (config-config-app-hosting-vlan-access-ip)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

**Usage Guidelines** Configure this command, after configuring the **app-vnic gateway**, the **app-vnic management**, or **app-vnic AppGigabitEthernet vlan-access** commands.

Use this command to configure the guest interface address for the front-panel VLAN port for application-hosting.

### Examples

The following example shows how to configure the guest interface address for a virtual network interface gateway:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-vnic gateway1 VirtualPortGroup 0 guest-interface 1
Device(config-app-hosting-gateway)# guest-ipaddress 10.0.0.3 netmask 255.255.255.0
```

The following example shows how to configure the guest interface address for a management gateway:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-vnic management guest-interface 0
Device(config-app-hosting-mgmt-gateway)# guest-ipaddress 172.19.0.24 netmask 255.255.255.0
```

The following example shows how to configure the guest interface address for the front-panel VLAN port:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
```

```

Device(config-app-hosting)# app-vnic AppGigabitEthernet trunk
Device(config-config-app-hosting-trunk)# vlan 1 guest-interface 9
Device(config-config-app-hosting-vlan-access-ip)# guest-ipaddress 192.168.0.2
netmask 255.255.255.0
Device(config-config-app-hosting-vlan-access-ip)#

```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
<b>app-vnic gateway</b>	Configures a virtual network interface gateway.
<b>app-vnic AppGigabitEthernet trunk</b>	Configures a front-panel trunk port and enters application-hosting trunk configuration mode.
<b>app-vnic management</b>	Configures the management gateway of a virtual network interface.
<b>vlan (App Hosting)</b>	Configures a VLAN guest interface and enters application-hosting VLAN-access IP configuration mode.



# guestshell

To configure the Guest Shell infrastructure functionality, use the **guestshell** command in privileged EXEC mode.

**guestshell** {**destroy** | **disable** | **enable** | **run** [{*linux-executable*}]}

Syntax Description	Command	Description
	<b>destroy</b>	Deactivates and uninstalls the Guest Shell service.
	<b>disable</b>	Disables the Guest Shell service.
	<b>enable</b>	Disables the Guest Shell service.
	<b>run</b> [ <i>linux-executable</i> ]	Executes or runs a Linux program in the Guest Shell

**Command Default** Guest Shell is not enabled.

**Command Modes** Privileged EXEC (#)

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

**Usage Guidelines** Guest Shell is an embedded Linux environment that allows customers to develop and run custom Python applications for automated control and management of Cisco switches. Guest Shell is packaged as a Cisco application hosting framework (CAF)-formatted tar file (guest\_shell.tar) into the Cisco IOS XE Everest 16.5.x release image read-only file system.

Configure the **iox** command in global configuration mode, before configuring this command. IOx is the Cisco-developed framework for hosting customer-deployed Linux applications on Cisco networking systems.

## Examples

The following example shows how to enable and run the Guest Shell:

```
Device# configure terminal
Device(config)# iox
Device(config)# exit
Device# guestshell enable
Device# guestshell run
```

Related Commands	Command	Description
	<b>iox</b>	Configure IOx services.

# guestshell portforwarding

To enable Guest Shell port forwarding, use the **guestshell portforwarding** command in privileged EXEC mode.

**guestshell portforwarding** {**add table-entry** *entry-name* **service** {**tcp** | **udp**} **source-port** *port-number* **destination-port** *port-number* | **delete table-entry** *entry-name* }

Syntax Description		
<b>add</b>		Adds an IP table entry.
<b>table-entry</b> <i>entry-name</i>		Specifies the IP table name. The <i>table-name</i> argument must be unique, and it can be alphanumeric characters.
<b>service</b>		Specifies the service protocol.
<b>tcp</b>		Specifies TCP as the service protocol.
<b>udp</b>		Specifies UDP as the service protocol.
<b>source-port</b> <i>port-number</i>		Specifies the source port. Valid values for the <i>port-number</i> argument are from 1 to 65535.
<b>destination-port</b> <i>port-number</i>		Specifies the destination port. Valid values for the <i>port-number</i> argument are from 1 to 65535.
<b>delete</b>		Deletes an IP table entry.

**Command Default** Port forwarding is not enabled.

**Command Modes** Privileged EXEC (#)

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

**Usage Guidelines** Use this command to enable port forwarding for Guest Shell, when it connected through the GigabitEthernet 0/0 management interface

## Examples

The following example shows how to enable port forwarding for Guest Shell:

```
Device# configure terminal
Device(config)# iox
```

```
Device(config)# exit
Device# guestshell portforwarding add table-entry table1 service tcp
      source-port 32 destination-port 9
Device#
```

The following example shows how to disable port forwarding for Guest Shell:

```
Device# guestshell portforwarding delete table-entry table1
Device#
```

**Related Commands**

Command	Description
<b>guestshell</b>	Configures the Guest Shell infrastructure functionality.

# host

To specify the details of the named receiver host, use the **host** command in telemetry protocol-receiver configuration mode. To remove the host details, use the **no** form of this command.

```
host { ip-address ip-ipv6-address | name hostname } receiver-port
no host { ip-address ip-ipv6-address | name hostname } receiver-port
```

## Syntax Description

<b>ip-address</b> <i>ip-ipv6-address</i>	Specifies the host IPv4 or IPv6 address.
<b>name</b> <i>hostname</i>	Specifies the hostname.
<i>receiver-port</i>	Destination port number. Valid values are from 0 to 65535.

## Command Default

Host details are not specified.

## Command Modes

Telemetry protocol-receiver configuration (config-mdt-protocol-receiver)

## Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

## Usage Guidelines

The host specification for a named receiver takes a hostname or an IP address, and a destination port number.

## Example

The following example shows how to configure a host name for a named receiver:

```
Device> enable
Device# configure terminal
Device(config)# telemetry receiver protocol receiver1
Device(config-mdt-protocol-receiver)# host name rcvr.test.com 45000
```

The following example shows how to configure the host IP address:

```
Device> enable
Device# configure terminal
Device(config)# telemetry receiver protocol receiver1
Device(config-mdt-protocol-receiver)# host ip-address 2001:db8::1 45000
```

## Related Commands

Command	Description
<b>protocol</b>	Specifies a protocol for the named receiver.
<b>telemetry receiver protocol</b>	Configures a named protocol receiver.

# install

To install data model update packages, use the **install** command in privileged EXEC mode.

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

## Syntax Description

<b>activate</b>	Validates whether the model update package is added through the <b>install add</b> command, and restarts NETCONF processes (confd and opdatamgrd).  This keyword runs a compatibility check, updates package status, and if the package can be restarted, it triggers post-install scripts to restart the necessary processes, or triggers a reload for non-restartable packages.
<b>file</b>	Specifies the package to be activated.
{bootflash:   flash:   http:   https:   rcp:   scp:   tftp:   webui:}	Specifies the location of the installed package.
<b>prompt-level</b> {all   none}	(Optional) Prompts the user about installation activities.  For example, the <b>activate</b> keyword, automatically triggers a reload for packages that require a reload. Before activating the package, a message will prompt users as to whether they want to continue.  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 (via FTP, TFTP) to a device, and performs a compatibility check for the platform and image versions.  This keyword runs base compatibility checks to ensure that a specified package is supported on a platform. It also adds an entry in the package file, so that the status can be monitored and maintained.
{http:   https:   rcp:   scp:   tftp:}	Specifies the package to be added.

<b>commit</b>	Makes changes persistent over reloads.  You can do 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>deactivate</b>	Deactivates an installed package.  Deactivating a package also updates the package status and triggers a process restart or a reload.
<b>remove</b>	Remove installed packages.  The package file is removed from the file system. The <b>remove</b> keyword can only be used on packages that are currently inactive.
<b>inactive</b>	Removes all inactive packages from the device.
<b>rollback</b>	Rolls back the data model update package to the base version, the last committed version, or a known commit ID, and restarts NECONF processes.
<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**

Model update packages are not installed.

**Command Modes**

Privileged EXEC (#)

**Command History**

<b>Release</b>	<b>Modification</b>
Cisco IOS XE Everest 16.5.1	This command was introduced on the following platforms: <ul style="list-style-type: none"> <li>• Cisco 4000 Series Integrated Services Routers</li> <li>• Cisco Catalyst 9300 Series Switches</li> <li>• Cisco Catalyst 9500 Series Switches</li> <li>• Cisco Cloud Services Router 1000v</li> <li>• Cisco Integrated Services Virtual Routers (ISRv)</li> </ul>

Release	Modification
Cisco IOS XE Everest 16.6.1	<p>This command was implemented on the following platforms:</p> <ul style="list-style-type: none"> <li>• Cisco Catalyst 3650 Series Switches</li> <li>• Cisco Catalyst 3850 Series Switches</li> </ul>

## Usage Guidelines

In Service Model Update adds new data models or extend functionality to existing data models. The update package provides YANG model enhancements outside of a release cycle. The update package is a superset of all existing models; it includes all existing models as well as updated YANG models.

A model update package must be added prior to activating the update package. A package must be deactivated, before it is removed from the bootflash.

### Cisco 4000 Series Integrated Services Routers

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

```
Device# install add file tftp://172.16.0.1//tftpboot/folder1/isr4300-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.dmp.bin

install_add: START Sun Feb 26 05:57:04 UTC 2017
Downloading file tftp://172.16.0.1//tftpboot/folder1/isr4300-universalk9.2017-01-10_13.15.1.
CSCxxxxxxx.dmp.bin
Finished downloading file
tftp://172.16.0.1//tftpboot/folder1/isr4300-universalk9.2017-01-10_13.15.1.
CSCxxxxxxx.dmp.bin to bootflash:isr4300-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.dmp.bin
SUCCESS: install_add /bootflash/isr4300-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.dmp.bin
Sun Feb 26 05:57:22 UTC 2017
```

The following example shows how to activate an install package:

```
Device# install activate file bootflash:
isr4300-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.dmp.bin

install_activate: START Sun Feb 26 05:58:41 UTC 2017
DMP package.
Netconf processes stopped
SUCCESS: install_activate /bootflash/isr4300-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.dmp.bin

Sun Feb 26 05:58:58 UTC 2017
*Feb 26 05:58:47.655: %DMI-4-CONTROL_SOCKET_CLOSED: SIP0: nesd:
ConfD control socket closed Lost connection to ConfD (45): EOF on socket to ConfD.
*Feb 26 05:58:47.661: %DMI-4-SUB_READ_FAIL: SIP0: vtyserverutild:
ConfD subscription socket read failed Lost connection to ConfD (45):
EOF on socket to ConfD.
*Feb 26 05:58:47.667: %DMI-4-CONTROL_SOCKET_CLOSED: SIP0: syncfd:
ConfD control socket closed Lost connection to ConfD (45): EOF on socket to ConfD.
*Feb 26 05:59:43.269: %DMI-5-SYNC_START: SIP0: syncfd:
External change to running configuration detected.
The running configuration will be synchronized to the NETCONF running data store.
*Feb 26 05:59:44.624: %DMI-5-SYNC_COMPLETE: SIP0: syncfd:
The running configuration has been synchronized to the NETCONF running data store.
```

The following example shows how to commit an installed package:

```
Device# install commit
```

```
install_commit: START Sun Feb 26 06:46:48 UTC 2017
SUCCESS: install_commit Sun Feb 26 06:46:52 UTC 2017
```

The following example shows how to rollback to the base package:

```
Device# install rollback to base
```

```
install_rollback: START Sun Feb 26 06:50:29 UTC 2017
7 install_rollback: Restarting impacted processes to take effect
7 install_rollback: restarting confd

*Feb 26 06:50:34.957: %DMI-4-CONTROL_SOCKET_CLOSED: SIP0: syncfd:
ConfD control socket closed Lost connection to ConfD (45): EOF on socket to ConfD.
*Feb 26 06:50:34.962: %DMI-4-CONTROL_SOCKET_CLOSED: SIP0: ned:
ConfD control socket closed Lost connection to ConfD (45): EOF on socket to ConfD.
*Feb 26 06:50:34.963: %DMI-4-SUB_READ_FAIL: SIP0: vtyserverutil:
ConfD subscription socket read failed Lost connection to ConfD (45):
EOF on socket to ConfD.Netconf processes stopped
7 install_rollback: DMP activate complete
SUCCESS: install_rollback Sun Feb 26 06:50:41 UTC 2017
*Feb 26 06:51:28.901: %DMI-5-SYNC_START: SIP0: syncfd:
External change to running configuration detected.
The running configuration will be synchronized to the NETCONF running data store.
*Feb 26 06:51:30.339: %DMI-5-SYNC_COMPLETE: SIP0: syncfd:
The running configuration has been synchronized to the NETCONF running data store.
```

### Cisco Catalyst 3000 Series Switches

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

```
Device# install add file tftp://172.16.0.1//tftpboot/folder1/i
cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
```

```
install_add: START Sat Jul 29 05:57:04 UTC 2017
Downloading file tftp://172.16.0.1//tftpboot/folder1/
cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
Finished downloading file tftp://172.16.0.1//tftpboot/folder1/
cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.Sdmp.bin to
bootflash:cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
SUCCESS: install_add /bootflash/
cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
Sat Jul 29 05:57:22 UTC 2017
```

The following sample output from the **show install summary** command displays that the update package is now committed, and that it will be persistent across reloads:

```
Device# show install summary
```

```
Active Packages:
bootflash:cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
Inactive Packages:
No packages
Committed Packages:
bootflash:cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
Uncommitted Packages:
No packages
Device#
```



**Related Commands**

Command	Description
<b>show install</b>	Displays information about model update packages.

# iox

To configure IOx services, use the **iox** command in global configuration mode. To remove the configuration, use the **no** form of this command.

**iox**  
**no iox**

This command has no arguments or keywords.

**Command Default** IOx services are not configured.

**Command Modes** Global configuration (config)

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

**Usage Guidelines** IOx is the Cisco-developed framework for hosting customer-deployed Linux applications on Cisco networking systems. IOx facilitates the life-cycle management of app and data exchange by providing a set of services that helps developers to package pre-built apps, and host them on a target device. IOx life-cycle management includes distribution, deployment, hosting, starting, stopping (management), and monitoring of apps and data. IOx services also include app distribution and management tools that help users discover and deploy apps to the IOx framework.

## Examples

The following example shows how to configure IOx services:

```
Device# configure terminal
Device(config)# iox
Device(config)# exit
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>guestshell</b>	Configures Guest Shell infrastructure functionality.

# logging flow-modify

Effective with Cisco IOS XE Cupertino 17.7.1, the **logging flow-modify** command is not available in Cisco IOS XE software.

To enable error logs for flows, use the **logging flow-modify** command in OpenFlow switch configuration mode. To disable logging, use the **no** form of this command.

**logging flow-modify**  
**no logging flow-modify**

This command has no arguments or keywords.

## Command Default

Error logging is not configured.

## Command Modes

OpenFlow switch configuration (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following example shows how to enable logging for flows:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# logging flow-modify
```

## Related Commands

Command	Description
<b>feature openflow</b>	Enables the OpenFlow feature.
<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
<b>switch(OpenFlow)</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# memory (App Hosting)

To change the memory allocated by the application, use the **memory** command in custom application resource profile configuration mode. To revert to the application-provided memory size, use the **no** form of this command.

**memory** *memory*  
**no memory** {[ *memory* ]}

<b>Syntax Description</b>	<i>memory</i>	Memory allocation in MB. Valid values are from 0 to 4096.
---------------------------	---------------	---

**Command Default** The default memory size depends on the platform.

**Command Modes** Custom application resource profile configuration (config-app-resource-profile-custom)

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Fuji 16.9.1	This command was introduced.

**Usage Guidelines** Within each application package, an application-specific resource profile is provided that defines the recommended CPU load, memory size, and number of virtual CPUs (vCPUs) required for the application. Use this command to change the allocation of resources for specific processes in the custom resource profile. Reserved resources specified in the application package can be changed by setting a custom resource profile. Only the CPU, memory, and vCPU resources can be changed. For the resource changes to take effect, stop and deactivate the application, then activate it and start it again.



**Note** Resource values are application-specific, and any adjustment to these values must ensure that the application can run reliably with the changes.

## Examples

The following example shows how to override the application-provided memory using a custom resource profile:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-resource profile custom
Device(config-app-resource-profile-custom)# memory 2048
Device(config-app-resource-profile-custom)#
```

## Related Commands

<b>Command</b>	<b>Description</b>
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
<b>app-resource profile</b>	Overrides the application-provided resource profile.

# mlog

To direct log messages to a memory buffer instead of the serial port, use the **mlog** command in rommon mode.

**mlog** [{**show** | **reset** | **ctrl** [{**on** | **off** | **toggle**}]]

Syntax Description		
<b>show</b>	(Optional)	Displays memory log messages.
<b>reset</b>	(Optional)	Resets the logging of messages to the memory log.
<b>ctrl</b>	(Optional)	
<b>on</b>	(Optional)	
<b>off</b>	(Optional)	
<b>toggle</b>	(Optional)	

**Command Modes** Rommon

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

**Usage Guidelines** This command directs protocol log (that is all logs controlled by the **net-debug** command) messages to a memory buffer instead of the serial port.

With memory logging, log messages are displayed after a test is run. For example, HTTP debugs can be enabled through memory logging. Log messages are displayed in the memory buffer after running a copy from `http://server/name to null: command`.

### Example

The following example shows how to direct log messages to the memory buffer:

Device: **mlog show**

Related Commands	Command	Description
	<b>net-debug</b>	Displays or changes the network debug values.

# monitor log profile netconf-yang

To display debug logs for NETCONF-YANG processes, use the **monitor log profile netconf-yang** command in privileged EXEC mode.

## monitor log profile netconf-yang internal

### Syntax Description

**internal** Displays all debug logs.

**Note** This keyword is mainly used by customer support.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1	This command was introduced.

### Usage Guidelines

Logs generated by this command are rendered on the device console.

### Example

The following example shows how to enable the **monitor log profile netconf-yang internal** command:

```
Device# monitor log profile netconf-yang internal

2018/01/24 15:58:50.356 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): gdb port
9919 allocated
2018/01/24 15:58:50.365 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): swift_repl
port 8019 allocated
2018/01/24 15:58:50.430 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): process
scoreboard /tmp/rp/
process/pttcd%rp_0_0% pttcd%rp_0_0%.pid is 12040
2018/01/24 15:58:50.430 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
pttcd%rp_0_0%.gdbport is 9919
2018/01/24 15:58:50.430 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
pttcd%rp_0_0%.swift_replport is 8019
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): Launching
pttcd on fru rp slot 0
bay 0 instance 0 log /tmp/rp/trace/pttcd_pmanlog
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): Hold
failures 2, hold interval 1800
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): PATH is
/tmp/sw/rp/0/0/rp_daemons/

mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/conf:/tmp/sw/rp/0/0/

rp_daemons/mount/usr/binos/sbin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin:/tmp/sw/rp/0/0/rp_daemons/mount/

usr/cpp/bin:/usr/bin:/bin:/sbin:/usr/binos/conf:/usr/binos/bin:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf:
```

```

/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
LD_LIBRARY_PATH is
2018/01/24 15:58:50.441 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
PREPROC_OPTIONS ==
2018/01/24 15:58:50.441 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): command
line used pttcd >>
/tmp/rp/trace/pttcd_pmanlog_cmd 2&>1 &
2018/01/24 15:58:50.444 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): full_path
is /tmp/sw/rp/0/0
/rp_daemons/mount/usr/binos/bin/pttcd
2018/01/24 15:58:50.446 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): Resolved
readlink process

/tmp/sw/mount/asr1000rpx86-rpcontrol.BLD_V168_THROTTLE_LATEST_20180122_164958_V16_8_0_177.SSA.pkg/usr/binos/bin/pttcd
2018/01/24 15:58:50.446 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): Full
path used to spawn the process:
/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pttcd
2018/01/24 15:58:50.452 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): Binary_arch
set to: [x86_64_cge7]
2018/01/24 15:58:50.461 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): actual
pttcd pid is 12542
2018/01/24 15:58:50.461 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): Checking
for cgroup for PID 12542
2018/01/24 15:58:50.461 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
/tmp/rp/pvp/process_state/pttcd%rp_0_0%#12040_state marked up
2018/01/24 15:58:50.474 {pttcd_R0-0}{1}: [pttcd] [12542]: (ERR): init_callhome() failed
2018/01/24 15:58:50.475 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): oom score
adj value is 399
2018/01/24 15:58:50.475 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): Wait for
signal or process exit: 12542
2018/01/24 15:58:52.077 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): gdb port
9920 allocated
2018/01/24 15:58:52.085 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): swift_repl
port 8020 allocated
2018/01/24 15:58:52.157 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): process
scoreboard /tmp/rp/process
/pubd%rp_0_0% pubd%rp_0_0%.pid is 14416
2018/01/24 15:58:52.157 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
pubd%rp_0_0%.gdbport is 9920
2018/01/24 15:58:52.157 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
pubd%rp_0_0%.swift_replport is 8020
2018/01/24 15:58:52.166 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Launching
pubd on fru rp slot 0 bay 0
instance 0 log /tmp/rp/trace/pubd_pmanlog
2018/01/24 15:58:52.166 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Hold
failures 2, hold interval 1800
2018/01/24 15:58:52.166 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): PATH is
/tmp/sw/rp/0/0/rp_daemons

/mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/conf:/tmp/sw/rp/0/0

/rp_daemons/mount/usr/binos/sbin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr

/cpp/bin:/usr/bin:/bin:/sbin:/usr/binos/conf:/usr/binos/bin:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf:/sbin:/bin:

/usr/bin:/usr/sbin:/usr/binos/conf
2018/01/24 15:58:52.166 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
LD_LIBRARY_PATH is
2018/01/24 15:58:52.167 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
PREPROC_OPTIONS ==

```

```

2018/01/24 15:58:52.167 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): command
line used pubd >>
/tmp/rp/trace/pubd_pmanlog_cmd 2&>1 &
2018/01/24 15:58:52.170 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): full_path
is /tmp/sw/rp/0/0
/rp_daemons/mount/usr/binos/bin/pubd
2018/01/24 15:58:52.172 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Resolved
readlink process

/tmp/sw/mount/asr1000rpx86-rpcontrol.BLD_V168_THROTTLE_LATEST_20180122_164958_V16_8_0_177.SSA.pkg/usr/binos/bin/pubd
2018/01/24 15:58:52.172 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Full path
used to spawn the process:
/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pubd
2018/01/24 15:58:52.177 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Binary_arch
set to: [x86_64_cge7]
2018/01/24 15:58:52.184 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): actual
pubd pid is 14920
2018/01/24 15:58:52.184 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Checking
for cgroup for PID 14920
2018/01/24 15:58:52.184 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Setting
cgroup iosxe_control_processes
/iosxe_mgmt_processes for PID 14920 and PID 14416
2018/01/24 15:58:52.188 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
/tmp/rp/pvp/process_state/pubd%rp_0_0%#14416_state marked up
2018/01/24 15:58:52.193 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): oom score
adj value is 399
2018/01/24 15:58:52.194 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): Wait for
signal or process exit: 14920
2018/01/24 15:58:52.540 {pttcd_R0-0}{1}: [pttcd] [12542]: (ERR): PPTCD_1_abcdefghi
transaction id = 1
2018/01/24 15:58:57.133 {syncfd_pmanlog_R0-0}{1}: [syncfd_pmanlog] [19542]: (note): gdb
port 9922 allocated
2018/01/24 15:58:57.147 {syncfd_pmanlog_R0-0}{1}: [syncfd_pmanlog] [19542]: (note):
swift_repl port 8022 allocated
2018/01/24 15:58:57.296 {syncfd_pmanlog_R0-0}{1}: [syncfd_pmanlog] [19542]: (note):
process scoreboard /tmp/rp/process/syncfd%rp_0_0% syncfd%rp_0_0%.pid is 19470

```



# monitor log profile restconf

To display debug logs for RESTCONF processes, use the **monitor log profile restconf** command in privileged EXEC mode.

**monitor log profile netconf-yang internal**

<b>Syntax Description</b>	<b>internal</b> Displays all debug logs.
	<b>Note</b> This keyword is used by customer support.

<b>Command Modes</b>	Privileged EXEC (#)
----------------------	---------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Fuji 16.8.1	This command was introduced.

**Usage Guidelines** Logs generated by this command are rendered on the device console.

### Example

The following example shows how to enable the **monitor log profile restconf internal** command:

```

Device# monitor log profile restconf internal

Displaying traces starting from 2018/03/23 09:10:02.000. If no traces are present, the
command will wait until one is.

2018/03/23 13:05:13.945 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): gdb port
9908 allocated
2018/03/23 13:05:13.962 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): swift_repl
port 8008 allocated
2018/03/23 13:05:14.050 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
process scoreboard /tmp/rp/process/pttcd%rp_0_0% pttcd%rp_0_0%.pid is 2550
2018/03/23 13:05:14.050 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
pttcd%rp_0_0%.gdbport is 9908
2018/03/23 13:05:14.050 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
pttcd%rp_0_0%.swift_replport is 8008
2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
Launching pttcd on fru rp slot 0 bay 0 instance 0 log /tmp/rp/trace/pttcd_pmanlog
2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Hold
failures 2, hold interval 1800
2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
PATH is /tmp/sw/rp/0/0/rp_daemons/mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:

/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/conf:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/sbin:

/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/cpp/bin:

/usr/bin:/bin:/sbin:/usr/binos/conf:/usr/binos/bin:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf:/sbin:/bin:

/usr/bin:/usr/sbin:/usr/binos/conf
    
```

```

2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
LD_LIBRARY_PATH is
2018/03/23 13:05:14.063 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
PREPROC_OPTIONS ==
2018/03/23 13:05:14.063 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): command
line used pttcd >>
/tmp/rp/trace/pttcd_pmanlog_cmd 2&>1 &
2018/03/23 13:05:14.068 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
full_path is /tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pttcd
2018/03/23 13:05:14.069 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
Resolved readlink process /tmp/sw/mount/asr1000rpx86-rpcontrol.2018-03-07_18.30_rifu.SSA.pkg

/usr/binos/bin/pttcd
2018/03/23 13:05:14.069 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Full path
used to spawn the process:
/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pttcd
2018/03/23 13:05:14.076 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Binary_arch
set to: [x86_64_cge7]
2018/03/23 13:05:14.088 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): actual
pttcd pid is 2936
2018/03/23 13:05:14.088 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Checking
for cgroup for PID 2936
2018/03/23 13:05:14.088 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
/tmp/rp/pvp/process_state/pttcd%rp_0_0%#2550_state marked up
2018/03/23 13:05:14.097 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): oom score
adj value is 399
2018/03/23 13:05:14.102 {pttcd_R0-0}{1}: [pttcd] [2936]: (ERR): init_callhome() failed
2018/03/23 13:05:14.102 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Wait for
signal or process exit: 2936
2018/03/23 13:05:16.895 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): gdb port
9920 allocated
2018/03/23 13:05:16.904 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): swift_repl
port 8020 allocated
2018/03/23 13:05:16.987 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): process
scoreboard
/tmp/rp/process/pubd%rp_0_0%0 pubd%rp_0_0%0.pid is 4922
2018/03/23 13:05:16.987 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
pubd%rp_0_0%0.gdbport is 9920
2018/03/23 13:05:16.987 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
pubd%rp_0_0%0.swift_replport is 8020
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
Launching pubd on fru rp slot 0 bay 0 instance 0 log /tmp/rp/trace/pubd_pmanlog
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): Hold failures
2, hold interval 1800
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): PATH is
/tmp/sw/rp/0/0/rp_daemons/mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:/tmp/sw/rp/0/0/
rp_daemons/mount/usr/binos/conf:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/sbin:/tmp/sw/rp/0/0/
rp_daemons/mount/usr/binos/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/cpp/bin:/usr/bin:/bin:/sbin:
/usr/binos/conf:/usr/binos/bin:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf:/sbin:/bin:/usr/bin:
/usr/sbin:/usr/binos/conf
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
LD_LIBRARY_PATH is
2018/03/23 13:05:17.001 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
PREPROC_OPTIONS ==
2018/03/23 13:05:17.001 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): command
line used pubd >>
/tmp/rp/trace/pubd_pmanlog_cmd 2&>1 &

```

```
2018/03/23 13:05:17.007 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
  full_path is /tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pubd
2018/03/23 13:05:17.009 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): Resolved
readlink process
  /tmp/sw/mount/asr1000rpx86-rpcontrol.2018-03-07_18.30_rifu.SSA.pkg/usr/binos/bin/pubd
2018/03/23 13:05:17.009 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): Full path
used to spawn the process:
  /tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pubd
2018/03/23 13:05:17.017 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): Binary_arch
set to: [x86_64_cge7]
2018/03/23 13:05:17.031 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): actual pubd
pid is 5303
2018/03/23 13:05:17.031 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): Checking
for cgroup for PID 5303
2018/03/23 13:05:17.031 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
Setting cgroup iosxe_control_processes/iosxe_mgmt_processes for PID 5303 and PID 4922
2018/03/23 13:05:17.045 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
  /tmp/rp/pvp/process_state/pubd%rp_0_0#4922_state marked up
2018/03/23 13:05:17.047 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): oom score
adj value is 399
```

# name-server (App Hosting)

To configure a Domain Name System (DNS) server, use the **name-server** command in application hosting configuration mode. To remove the DNS server configuration, use the **no** form of this command.

**name-server***number ip-address*  
**no name-server***number* [*{ip-address}*]

<b>Syntax Description</b>	<i>ip-address</i>	IP address the of the DNS server.
<b>Command Default</b>	DNS server is not configured.	
<b>Command Modes</b>	Application hosting configuration (config-app-hosting)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
<b>Usage Guidelines</b>	While configuring a static IP address in a Linux container for application hosting, only the last configured name server configuration is used.	

## Example

The following example shows how to configure a DNS server for a virtual network interface gateway:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-vnic gateway1 VirtualPortGroup 0 guest-interface 1
Device(config-app-hosting-gateway1)# guest-ipaddress 10.0.0.3 netmask 255.255.255.0
Device(config-app-hosting-gateway1)# exit
Device(config-app-hosting)# name-server0 10.2.2.2
Device(config-app-hosting)# end
```

Command	Description
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
<b>app-hosting gateway</b>	Configures a virtual network interface gateway.
<b>guest-ipaddress</b>	Configures an IP address for the guest interface.

# net-debug

To display or change the network debug values use the **net-debug** command in rommon mode.

**net-debug** [{*new-value*}]

<b>Syntax Description</b>	<i>new-value</i>	(Optional) New debug value to use.
<b>Command Modes</b>	Rommon	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Everest 16.5.1	This command was introduced.

**Usage Guidelines** This command enables or disables log levels for each of the following functional areas:

- Domain Name System (DNS)
- Dynamic Host Control Protocol (DHCP)
- File Transfer Protocol (FTP)
- Hypertext Transfer Protocol (HTTP)
- IP
- TCP
- UDP
- Uniform Resource Identifier (URI)

## Example

The following is sample output from the **net-debug** command:

```
Device: net-debug

ether: 0
 ip: 0
 dhcp: 0
 udp: 0
 tcp: 0
 http: 0
 dns: 0
 uri: 0
 t/ftp: 2
 ip6: 0
 dhcp6: 0:000 200 000 000
```

---

**Related Commands**

Command	Description
<b>mlog</b>	Directs log messages to a memory buffer instead of the serial port.

# net-dhcp

To initiate an IPv4 Dynamic Host Control Protocol (DHCP) request for remote configuration, use the **net-dhcp** command in rommon mode.

**net-dhcp** [{**timeout**}]

<b>Syntax Description</b>	<b>timeout</b>	(Optional) Timeout in seconds.
<b>Command Modes</b>	Rommon	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Everest 16.5.1	This command was introduced.
<b>Usage Guidelines</b>	This command initiates an IPv4 DHCP request and processes the reply.	

## Example

The following example shows how to enable the **net-dhcp** command:

Device: **net-dhcp**

Related Commands	Command	Description
	<b>net-debug</b>	Displays or changes the network debug values.
	<b>net-show</b>	Displays network parameters.
	<b>net6-dhcp</b>	Initiates an IPv6 DHCP request for remote configuration.

# net-show

To display network parameters, use the **net-show** command in rommon mode.

## net-show

This command has no arguments or keywords.

**Command Modes** Rommon

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

**Usage Guidelines** This command displays network configuration such as IP address, gateway, MAC address and so on.

## Example

The following is sample output from the **net-show** command:

```
Device: net-show
Network params:
IPv4:
    ip addr 10.29.27.150
    netmask 255.255.0.0
    gateway 10.29.0.1
IPv6:
link-local addr fe80::366f:90ff:feb8:cb80
site-local addr fec0::366f:90ff:feb8:cb80
    DHCP addr 2001:dead:beef:cafe::9999
    router addr fe80::7ada:6eff:fe13:8580
    SLAAC addr 2001:dead:beef:cafe:366f:90ff:feb8:cb80 /64
    SLAAC addr f00d::366f:90ff:feb8:cb80 /64
    SLAAC addr feed::366f:90ff:feb8:cb80 /64
Common:
    macaddr 34:6f:90:b8:cb:80
    dns 2001:dead:beef:cafe::5
    bootfile http://www.example.org/ed10m
    domain ip6.example.org
```

Command	Description
net6-show	Displays IPv6 network parameters.



# net-tcp-bufs

To display TCP buffers, use the **net-tcp-bufs** command in rommon mode.

**net-tcp-bufs** [{*mss*}]

<b>Syntax Description</b>	<i>mss</i>	(Optional) The Maximum Segment Size (MSS) of TCP buffers.
<b>Command Modes</b>	Rommon	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Everest 16.5.1	This command was introduced.
<b>Usage Guidelines</b>	You can set the MSS of TCP buffers using the <i>mss</i> argument.	

## Example

The following is sample output from the **net-tcp-bufs** command:

```
Device: net tcp-bufs
```

```
tcp_num_bufs 4
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>net-tcp-mss</b>	View or set the TCP MSS.

# net-tcp-mss

To view or set the TCP Maximum Segment Size (MSS), use the **net-tcp-mss** command in rommon mode.

**net-tcp-mss** [*{mss}*]

<b>Syntax Description</b>	<i>mss</i>	(Optional) The Maximum Segment Size (MSS) of TCP buffers.
<b>Command Modes</b>	Rommon	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Everest 16.5.1	This command was introduced.
<b>Usage Guidelines</b>	Use the <i>mss</i> argument to change the MSS size.	

## Example

The following is sample output from the **net-tcp-mss** command:

```
Device: net-tcp-mss
switch: net-tcp-mss
tcp_segment_size 1024
```

The following is sample output from the **net-tcp-mss mss** command:

```
Device: net-tcp-mss 700
switch: net-tcp-mss 700
tcp_segment_size 700
```

## Related Commands

Command	Description
<b>net-tcp-bufs</b>	Displays TCP buffers.

# net6-dhcp

To initiate an IPv6 Dynamic Host Control Protocol (DHCP) request for remote configuration, use the **net6-dhcp** command in rommon mode.

**net6-dhcp** [{**timeout**}]

<b>Syntax Description</b>	<b>timeout</b>	(Optional) Timeout in seconds.
<b>Command Modes</b>	Rommon	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Everest 16.5.1	This command was introduced.
<b>Usage Guidelines</b>	You can change the timeout by specifying a time in seconds	

## Example

The following example shows how to enable the **net6-dhcp** command:

Device: **net6-dhcp**

Related Commands	Command	Description
	<b>net-debug</b>	Displays or changes the network debug values.
	<b>net-dhcp</b>	Initiates an IPv4 DHCP request and processes the reply.
	<b>net-show</b>	Displays network parameters.

# net6-show

To display IPv6 network parameters, use the **net6-show** command in rommon mode.

## net6-show

This command has no arguments or keywords.

**Command Modes** Rommon

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

## Usage Guidelines

### Example

The following is sample output from the **net6-show** command:

```

Device: net6-show

switch: net6-show
IP6 addresses
link-local addr fe80::366f:90ff:feb8:cb80
site-local addr fec0::366f:90ff:feb8:cb80
    DHCP addr 2001:dead:beef:cafe::9999
router addr fe80::7ada:6eff:fe13:8580
    SLAAC addr 2001:dead:beef:cafe:366f:90ff:feb8:cb80 /64
    SLAAC addr f00d::366f:90ff:feb8:cb80 /64
    SLAAC addr feed::366f:90ff:feb8:cb80 /64
--
    null addr ::
    all-nodes addr ff02::1
all-routers addr ff02::2
    all-dhcp addr ff02::1:2
    Slct-node addr ff02::1:ffb8:cb80
    ll mmac addr 33:33:00:00:00:01
    sl mmac addr 33:33:00:00:00:02
    sn mmac addr 33:33:ff:b8:cb:80
    dhcp mmac addr 33:33:ff:00:99:99
router mac addr 78:da:6e:13:85:80

IP6 neighbour table
0: ip6 fec0::366f:90ff:feb8:cb80 MAC 34:6f:90:b8:cb:80
1: ip6 fe80::366f:90ff:feb8:cb80 MAC 34:6f:90:b8:cb:80
2: ip6 fe80::7ada:6eff:fe13:8580 MAC 78:da:6e:13:85:80
3: ip6 2001:dead:beef:cafe::5 MAC 30:f7:0d:08:7e:bd
4: ip6 fe80::32f7:ddf:fe08:7ebd MAC 30:f7:0d:08:7e:bd
    
```

## Related Commands

Command	Description
net-show	Displays network parameters.

## netconf detailed-error

To display helpful return codes if an invalid command is executed in a NETCONF session, use the **netconf detailed-error** command in global configuration mode. To stop displaying the return codes, use the **no** form of this command.

**netconf detailed-error**  
**no netconf detailed-error**

This command has no arguments or keywords.

**Command Default** NETCONF does not send return codes for invalid command execution.

**Command Modes** Global configuration (config)

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

**Usage Guidelines** The **netconf detailed-error** command configures NETCONF to send a "NOT OK" return code if you attempt to execute an invalid command.

For **show** commands, the return code appears in this form:

```
<return-code>NOT OK</return-code>
```

For configuration commands, the return code includes the line number of the invalid command. This example includes the request and the response, to illustrate:

```
Request:-
<?xml version="1.0" encoding="UTF-8"?>
<rpc message-id="101" xmlns="urn:iETF:params:xml:ns:netconf:base:1.0">
<edit-config>
<target>
<running/>
</target>
<config>
<cli-config-data>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>interface nve 1</cmd>
<cmd>member vni 5005</cmd>
<cmd>ingress-replication 10.1.1.1</cmd>
```

```

<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
<cmd>hostname sample-host1</cmd>
</cli-config-data>
</config>
</edit-config>
</rpc>]]>]]>

Response:-
<?xml version="1.0" encoding="UTF-8"?><rpc-reply message-id="101"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"><rpc-error>
<error-type>protocol</error-type><error-tag>operation-failed</error-tag>
<error-severity>error</error-severity><error-message>
**CLI Line # 20: % VNI 5005 already exists on other nve
interface</error-message></rpc-error></rpc-reply>]]>]]>

```



- Note** For a series of commands provided in an input XML:
- If NETCONF attempts to execute a series of **show** commands and it encounters an invalid command, NETCONF does not stop execution. It continues to execute other commands in the input XML, and provides the error return code(s) for invalid commands in the output.
  - If NETCONF attempts to execute a series of **configuration** commands and it encounters an invalid command, NETCONF stops execution. It provides the error return code for the invalid command, including line number, in the output.

**Examples**

Enabling detailed error reporting on a device:

```
Device (config)# netconf detailed-error
```

**Related Commands**

Command	Description
<b>netconf beep initiator</b>	Configures BEEP as the transport protocol for NETCONF and configures a peer as the BEEP initiator.
<b>netconf beep listener</b>	Configures BEEP as the transport protocol for NETCONF and configures a peer as the BEEP listener.
<b>netconf format</b>	Associates NETCONF with an ODM spec file for XML-formatted requests.
<b>netconf lock-time</b>	Specifies the maximum time a NETCONF configuration lock is in place without an intermediate operation.
<b>netconf max-sessions</b>	Specifies the maximum number of concurrent NETCONF sessions allowed.
<b>netconf ssh</b>	Enables NETCONF over SSHv2.

# netconf legacy

To enable legacy NETCONF protocol, use the **netconf legacy** command in global configuration mode. To disable the legacy NETCONF protocol, use the **no** form of this command.

**netconf legacy**  
**no netconf legacy**

This command has no arguments or keywords.

---

**Command Default** Legacy NETCONF protocol is not enabled.

---

**Command Modes** Global configuration (config)

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Denali 16.3.1	This command was introduced.

---

---

**Usage Guidelines** If this command is enabled, the RFC-compliant NETCONF client (ncclient) does not work. This command enables the legacy NETCONF protocol that is non-RFC-compliant.

## Example

The following example shows how to disable the legacy NETCONF protocol:

```
Device> enable
Device# configure terminal
Device(config)# no netconf legacy
```

# netconf-yang feature candidate-datasource

To enable the candidate datasource functionality, use the **netconf-yang feature candidate-datasource** command in global configuration mode. To disable the feature, use the **no** form of this command.

**netconf-yang feature candidate-datasource**  
**no netconf-yang feature candidate-datasource**

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

**Command Default** Candidate datasource is not enabled.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.1	This command was introduced.

**Usage Guidelines** Use the **netconf-yang feature candidate-datastore** command to enable the candidate datastore functionality. When the datastore state changes from running to candidate or back, a warning message is displayed notifying the user that a restart of NETCONF-YANG or RESTCONF will occur in order for the change to take effect. When candidate is enabled, The running data store is not writable through NETCONF sessions, all configurations get committed only through candidate. In other words, the writable-running NETCONF capability is not enabled with candidate.



**Note** Candidate data store is a shared data store, that is, multiple NETCONF sessions can modify the contents simultaneously. Therefore, it is important for a user to lock the data store before modifying its contents, to prevent conflicting commits which can eventually lead to losing any configuration changes; wherein another user overwrites the configuration by modifying the configuration and issuing a commit.

The following example shows how to enable the feature. If the selection of candidate or running datastore, is specified in the configuration when a NETCONF-YANG or RESTCONF confd process starts, a warning appears:

```
Device(config)# netconf-yang feature candidate-datastore
```

```
netconf-yang initialization in progress - datastore transition not allowed, please try again
after 30 seconds
```

If the selection of candidate or running is made after NETCONF-YANG or RESTCONF confd process starts, the following apply:

- If the **netconf-yang feature candidate-datastore** command is configured, the command enables the candidate datastore and prints the following warning:

```
"netconf-yang and/or restconf is transitioning from running to candidate netconf-yang
and/or
restconf will now be restarted, and any sessions in progress will be terminated".
```

- If the **netconf-yang feature candidate-datastore** command is removed, the command disables the "candidate" datastore, enables the "running" datastore and prints the following warning:



“netconf-yang and/or restconf is transitioning from candidate to running netconf-yang and/or restconf will now be restarted, and any sessions in progress will be terminated”.

- When NETCONF-YANG or RESTCONF are restarted, sessions in progress will be lost.

# netconf-yang feature side-effect-sync

To enable the partial synchronization NETCONF database, use the **netconf-yang feature side-effect-sync** command in global configuration mode. To disable the partial synchronization, use the **no** form of this command.

**netconf-yang feature side-effect-sync**  
**no netconf-yang feature side-effect-sync**

This command has no arguments or keywords.

**Command Default** Disabled.

**Command Modes** Global configuration (config)

## Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

## Usage Guidelines

During configuration changes in the data model interface (DMI), a partial synchronization of the changes that are triggered when a command or RPC is configured happens. This is called the side-effect synchronization, and it reduces the synchronization time and NETCONF downtime.

Some commands, when they are configured, triggers changes in some already configured commands. For example, the following is the configuration on a device before the NETCONF edit-config RPC is configured:

```
hostname device123
```

The NETCONF edit-config RPC:

```
<native xmlns="http://cisco.com/ns/yang/Cisco-IOS-XE-native">
  <hostname xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" nc:operation="delete"/>
</native>
```

The following is the configuration on the device after the NETCONF edit-config RPC is configured:

```
hostname Switch
```

## Example

The following example shows how to enable the **netconf-yang feature side-effect-sync** command:

```
Device> enable
Device# configure terminal
Device(config)# netconf-yang feature side-effect-sync
```

# netconf-yang ssh

To configure Secure Shell (SSH) options for a NETCONF-YANG session, use the **netconf-yang ssh** command in global configuration mode. To remove the SSH configuration, use the **no** form of this command.

```
netconf-yang ssh {{ipv4 | ipv6}access-list name access-list-name | port port-number}
no netconf-yang ssh {{ipv4 | ipv6 }access-list [{name access-list-name }]| port port-number}
```

Syntax Description		
	<b>ipv4</b>	Specifies the IP access-list configuration parameters.
	<b>ipv6</b>	Specifies the IPv6 access-list configuration parameters.
	<b>access-list <i>name</i></b>	Configures the NETCONF-YANG SSH service to use for a named IP or IPv6 ACL.
	<b>port <i>port-number</i></b>	Specifies the port number to listen on. Valid values for the <i>port-number</i> argument are from 1 to 65535.

**Command Default** Client connections are allowed.

**Command Modes** Global configuration (config)

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

**Usage Guidelines** Clients that do not conform to the configured ACL are not allowed to connect to the network. You can use an access-list name that is not defined.

### Example

The following example shows how to configure an IPv4 ACL for a NETCONF-YANG session.:

```
Device# configure terminal
Device(config)# netconf-yang ssh ipv4 access-list ipv4-acl
Device (config)#
```

The following example shows how to configure an IPv6 ACL for a NETCONF-YANG session:

```
Device# configure terminal
Device(config)# netconf-yang ssh ipv6 access-list ipv6-acl
Device (config)#
```

The following example shows how to configure the port number to listen on for a NETCONF-YANG session:

```
Device# configure terminal
Device(config)# netconf-yang ssh port 5
Device (config)#
```

The following example shows how to define an IP access list and associate it with a NETCONF-YANG session:

```
Device# configure terminal
Device(config)# ip access-list standard acl1_permit
Device(config-std-nacl)# permit 192.168.255.0 0.0.0.255
Device(config-std-nacl)# deny any
Device(config-std-nacl)# exit
Device(config)# netconf-yang ssh ipv4 access-list name acl1_permit
Device(config)# end
```

### Related Commands

Command	Description
<b>deny</b>	Sets conditions in an IP/IPv6 access list that will deny packets.
<b>ip access-list</b>	Defines a standard IP access list and enters standard access-list configuration mode.
<b>ipv6 access-list</b>	Defines an IPv6 access list and enters IPv6 access list configuration mode.
<b>permit</b>	Sets conditions in an IP/IPv6 access list that will permit packets.

# netconf-yang ssh local-vrf guestshell

To enable NETCONF-YANG access through an SSH connection from within the Guest Shell, use the **netconf-yang ssh local-vrf guestshell** command in global configuration mode. To disable the NETCONF-YANG access, use the **no** form of this command.

```
netconf-yang ssh local-vrf guestshell port-number
no netconf-yang ssh local-vrf guestshell port-number
```

## Syntax Description

*port-number* The port number for NETCONF access.

## Command Default

NETCONF access from Guest Shell is disabled.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

## Usage Guidelines

To enable NETCONF-YANG access from within the Guest Shell, you must run the following commands in the Guest Shell prompt:

- **iosp\_client -f netconf\_enable guestshell** *port-number*
- **iosp\_client -f netconf\_enable\_passwordless guestshell** *username*

The **iosp\_client -f netconf\_enable guestshell** *port-number* command configures the **netconf-yang ssh local-vrf guestshell** command, and blocks connections until NETCONF-YANG is available. The **iosp\_client -f netconf\_enable\_passwordless guestshell** *username* command generates the SSH keys for Guest Shell access.

## Example

The following example shows how to enable NETCONF-YANG access through the Guest Shell:

```
Device> enable
Device# configure terminal
Device(config)# netconf-yang ssh local-vrf guestshell 803
```

# netconf-yang ssh port disable

To disable all external connectivity for NETCONF-YANG, use the **netconf-yang ssh port disable** command in global configuration mode.

## netconf-yang ssh port disable

This command has no arguments or keywords.

---

**Command Default** External ports are enabled.

---

**Command Modes** Global configuration (config)

---

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

---



---

**Usage Guidelines** This command closes external ports, only internal connections, such as the ones used for Guest Shell, remain open.

## Example

The following example shows how to disable external connections for NETCONF-YANG:

```
Device> enable
Device# configure terminal
Device(config)# netconf-yang ssh port-disable
```

# ping

To diagnose basic network connectivity, use the **ping** command in rommon mode.

**ping** [{*host\_ip\_address*}] [{*retries*}]

<b>Syntax Description</b>	<i>host_ip_address</i>	(Optional) IP address of the host.
	<i>retries</i>	(Optional) Number of retries.

<b>Command Modes</b>	Rommon
----------------------	--------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
		Cisco IOS XE Everest 16.5.1

**Usage Guidelines**

The **ping** and **ping4** commands are the same.

The **ping** command is a very common method for troubleshooting the accessibility of devices

A timeout is implemented at the bootloader device prompt, that allows the bootloader to poll the TCP stack every 200 ms. As a result, the bootloader may take up to 200 ms to respond to pings. However, when the bootloader is downloading a file, and thus actively polling for new packets, it responds to ping quickly.

### Example

The following is sample output from the **ping** command:

```
Device: ping 10.29.27.5
Ping 10.29.27.5 with 32 bytes of data ...
Host 10.29.27.5 is alive.
```

The following is sample output from the **ping host\_ip\_address retries** command:

```
Device: ping 10 6.29.27.5 6
Ping 10.29.27.5 with 32 bytes of data ... reply received in 0 ms
Ping 10.29.27.5 with 32 bytes of data ... reply received in 0 ms
Ping 10.29.27.5 with 32 bytes of data ... reply received in 0 ms
Ping 10.29.27.5 with 32 bytes of data ... reply received in 1 ms
Ping 10.29.27.5 with 32 bytes of data ... reply received in 0 ms
Ping 10.29.27.5 with 32 bytes of data ... reply received in 0 ms
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>ping4</b>	Diagnoses basic network connectivity.
	<b>ping6</b>	Determines the network connectivity to another device using IPv6 addressing.

# ping4

To diagnose basic network connectivity, use the **ping4** command in rommon mode.

**ping4** [{*host\_ip\_address* }][{*retries*}]

Syntax Description		
	<i>host_ip_address</i>	(Optional) IP address of the host to be pinged.
	<i>retries</i>	(Optional) Number of retries.

**Command Modes** Rommon

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

**Usage Guidelines** The **ping** and **ping4** commands are the same

A timeout is implemented at the bootloader device prompt, that allows the bootloader to poll the TCP stack every 200 ms. As a result, the bootloader may take up to 200 ms to respond to pings. However, when the bootloader is downloading a file, and thus actively polling for new packets, it responds to ping quickly.

## Example

The following is sample output from the **ping4** *host\_ip\_address* command:

```
Device: ping4 10.29.27.5

Ping 10.29.27.5 with 32 bytes of data ...
Host 10.29.27.5 is alive.
```

Related Commands	Command	Description
	<b>ping</b>	Diagnoses basic network connectivity.
	<b>ping6</b>	Determines the network connectivity to another device using IPv6 addressing.



# ping6

To determine the network connectivity to another device using IPv6 addressing, use the **ping6** command in rommon mode.

**ping6** [*host*] [*repeats*] [*len*]

<b>Syntax Description</b>	<i>host</i>	(Optional) IP address of the host to be pinged.
	<i>repeats</i>	(Optional) Number of times to repeat the ping.

<b>Command Modes</b>	Rommon
----------------------	--------

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

**Usage Guidelines** A timeout is implemented at the bootloader device prompt, that allows the bootloader to poll the TCP stack every 200 ms. As a result, the bootloader may take up to 200 ms to respond to pings. However, when the bootloader is downloading a file, and thus actively polling for new packets, it responds to ping quickly.

### Example

The following is sample output from the **ping6 host retries len** command:

```
Device: ping6 2001:DB8::1 6 1000

Ping host 2001:DB8::1, 6 times, 1000 bytes
Pinging 2001:DB8::1 ... reply in 0 ms
Pinging 2001:DB8::1 ... reply in 1 ms
Pinging 2001:DB8::1 ... reply in 1 ms
Pinging 2001:DB8::1 ... reply in 0 ms
Pinging 2001:DB8::1 ... reply in 0 ms
Pinging 2001:DB8::1 ... reply in 0 ms
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>ping</b>	Diagnoses basic network connectivity.
	<b>ping4</b>	Diagnoses basic network connectivity.

# prepend-pkg-opts

To merge the package options with the Docker runtime options, use the **prepend-pkg-opts** command in application-hosting docker configuration mode. To stop the merge, use the **no** form of this command.

**prepend-pkg-opts**  
**no prepend-pkg-opts**

This command has no arguments or keywords.

**Command Default** Package options are not merged with runtime options.

**Command Modes** Application-hosting docker configuration mode (config-app-hosting-docker)

Command History	Release	Modification
	Cisco IOS XE Amsterdam 17.3.3	This command was introduced.

**Usage Guidelines** If the same variable is available in both package and runtime options, it is overwritten.

## Example

The following example shows how to configure runtime options:

```
Device> enable
Device# configure terminal
Device(config)# app-hosting appid lkeys
Device(config-app-hosting)# app-resource docker
Device(config-app-hosting-docker)# prepend-pkg-opts
```

Related Commands	Command	Description
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>app-resource docker</b>	Enables the configuration of runtime Docker options.

# probe-interval

Effective with Cisco IOS XE Cupertino 17.7.1, the **probe-interval** command is not available in Cisco IOS XE software.

To configure the OpenFlow probe interval, use the **probe-interval** command in OpenFlow switch configuration mode. To disable the probe interval, use the **no** form of this command.

**probe-interval** *seconds*  
**no probe-interval**

<b>Syntax Description</b>	<i>seconds</i>	Probe interval in seconds. The default is 5.
---------------------------	----------------	--

**Command Default** 5 seconds

**Command Modes** OpenFlow switch configuration (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following example shows how to configure the probe interval:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# probe-interval 10
```

Related Commands	Command	Description
	<b>feature openflow</b>	Enables the OpenFlow feature.
	<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
	<b>switch(OpenFlow)</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# protocol

To specify a protocol for the named receiver, use the **protocol** command in telemetry protocol-receiver configuration mode. To remove the specified protocol, use the **no** form of this command.

```
protocol { cloud-native | cntp-tcp | cntp-tls profile profile-name | grpc-tcp | grpc-tls profile
profile-name | native | tls-native profile profile-name }
no protocol { cloud-native | cntp-tcp | cntp-tls profile profile-name | grpc-tcp | grpc-tls profile
profile-name | native | tls-native profile profile-name }
```

## Syntax Description

<b>cloud-native</b>	Specifies the Native Cloud protocol.
<b>cntp-tcp</b>	Specifies the Civil Network Time Protocol (CNTP) TCP protocol.
<b>cntp-tls</b>	Specifies the CNTP Transport Layer Security (TLS) protocol.
<b>grpc-tcp</b>	Specifies the Google Remote Procedure Call (gRPC) TCP protocol.
<b>grpc-tls</b>	Specifies the gRPC TLS protocol.
<b>profile</b> <i>profile-name</i>	Specifies the profile name for the connection.
<b>native</b>	Specifies the Native protocol.
<b>tls-native</b>	Specifies the Native-TLS protocol.

## Command Default

A protocol is not configured.

## Command Modes

Telemetry protocol-receiver configuration (config-mdt-protocol-receiver)

## Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

## Example

The following example shows how to configure a protocol for the named receiver:

```
Device> enable
Device# configure terminal
Device(config)# telemetry receiver protocol receiver1
Device(config-mdt-protocol-receiver)# protocol grpc-tcp
```

## Related Commands

Command	Description
<b>host</b>	Specifies named receiver host details.
<b>telemetry receiver protocol</b>	Configures a named protocol receiver.

# protocol-version

Effective with Cisco IOS XE Cupertino 17.7.1, the **protocol-version** command is not available in Cisco IOS XE software.

To configure an OpenFlow protocol to connect to the controller, use the **protocol-version** command in OpenFlow switch configuration mode. To disable the selected protocol, use the **no** form of this command.

**protocol-version** {1.0 | 1.3 | negotiate}  
**no protocol-version** {1.0 | 1.3 | negotiate}

Syntax Description		
	<b>1.0</b>	Configures OpenFlow 1.0 protocol to connect to the controller.
	<b>1.3</b>	Configures OpenFlow 1.3 protocol to connect to the controller.
	<b>negotiate</b>	Configures protocol negotiation with the controller.

**Command Default** Protocol is not configured.

**Command Modes** OpenFlow switch configuration (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following example shows how to configure an OpenFlow protocol:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# protocol-version 1.3
```

Related Commands	Command	Description
	<b>feature openflow</b>	Enables the OpenFlow feature.
	<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
	<b>switch(OpenFlow)</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# receiver

To configure a receiver to receive update notifications, use the **receiver** command in telemetry-subscription configuration mode. To disable the configuration, use the **no** form of this command.

```
receiver ip address { ipv4-address ipv6-address } port protocol protocol
no receiver ip address { ipv4-address ipv6-address } port protocol protocol
```

## Syntax Description

<b>ip address</b>	Configures the receiver IP address.
<i>ipv4-address ipv6-address</i>	IPv4 or IPv6 receiver address.
<i>port</i>	Configures a receiver port.
<b>protocol protocol</b>	Configures a protocol for notification. The following protocols are supported: <ul style="list-style-type: none"> <li>• <b>cloud-native</b></li> <li>• <b>cntp-tcp</b></li> <li>• <b>cntp-tls profile profile-name</b></li> <li>• <b>grpc-tcp</b></li> <li>• <b>grpc-tls profile profile-name</b></li> <li>• <b>native</b></li> <li>• <b>tls-native profile profile-name</b></li> </ul>

## Command Modes

Telemetry-subscription configuration (config-mdt-subs)

## Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Bengaluru 17.6.1	This command was modified. The following keywords and arguments were added: <b>cloud-native</b> , <b>cntp-tcp</b> , <b>cntp-tls</b> , <b>grpc-tcp</b> , <b>grpc-tls</b> , <b>native</b> , <b>tls-native</b> , <b>profile</b> , and <b>profile-name</b> .

## Usage Guidelines

A receiver is a network element that receives telemetry data. Configured subscriptions can be configured with multiple receivers, however; only the first valid receiver is used. If the first valid receiver is deleted, another receiver is connected.

## Example

The following example shows how to configure receiver information for receiving notifications:

```
Device> enable
Device# configure terminal
```

```
Device(config)# telemetry ietf subscription 101  
Device(config-mdt-subs)# receiver ip address 10.28.35.45 57555 protocol grpc-tcp
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>telemetry ietf subscription</b>	Configures telemetry subscription.
<b>receiver name</b>	Configures a named receiver for a subscription.

## receiver name

To configure a named receiver for a subscription, use the **receiver name** command in telemetry-subscription configuration mode. To remove the named receiver, use the **no** form of this command.

**receiver name** *receiver-name*

**no receiver name** *receiver-name*

<b>Syntax Description</b>	<i>receiver-name</i>	Host name of the receiver.
<b>Command Default</b>	A named receiver is not configured.	
<b>Command Modes</b>	Telemetry subscription configuration (config-mdt-subs)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.
<b>Usage Guidelines</b>	To use a named receiver in a subscription, both the receiver type and the receiver name must be specified. You can also configure a named receiver through the YANG model.	

### Example

The following example shows how to configure a named receiver for a subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# receiver type protocol
Device(config-mdt-subs)# receiver name my-receiver
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>receiver</b>	Configures a receiver to receive update notifications.
	<b>show telemetry receiver</b>	Displays the state of all telemetry receivers.
	<b>telemetry ietf subscription</b>	Configures telemetry subscription.



# receiver-type protocol

To configure a protocol-type named receiver, use the **receiver-type protocol** command in telemetry-subscription configuration mode. To remove the protocol-type named receiver, use the **no** form of this command.

**receiver-type protocol**  
**no receiver-type protocol**

This command has no arguments or keywords.

**Command Default** Protocol-type named receiver is not configured.

**Command Modes** Telemetry-subscription configuration (config-mdt-subs)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

**Usage Guidelines** Protocols are the only type of named receivers supported. For legacy receivers, the value is the default rcvr-type-unspecified.

## Example

The following example shows how to configure a protocol-type named receiver:

```
Device> enable
Device> configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# receiver-type protocol
```

Related Commands	Command	Description
	<b>telemetry ietf subscription</b>	Configures telemetry subscription.

# resource profile

To override the application-provided resource profile, use the **resource profile** command in application hosting configuration mode. To revert to the application-specified resource profile, use the **no** form of this command.

**resource profile** *profile-name* [**cpu number memory memory vcpu number**]  
**no resource** [**profile profile-name** ]

Syntax Description		
	<i>profile-name</i>	Application profile name.
	<b>cpu number</b>	Specifies the application CPU quota. Valid values are from 0 to 20000.
	<b>memory memory</b>	Specifies the memory allocation in MB. Valid values are from 0 to 4096.
	<b>vcpu number</b>	Specifies the application virtual CPU (vCPU) count. Valid values are from 0 to 65535.

**Command Modes** Application hosting configuration (config-app-hosting)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 1612.1	This command was introduced.

**Usage Guidelines** Within each application package, an application-specific resource profile is provided that defines the recommended CPU load, memory size, and number of vCPUs required for the application. Use this command to change the allocation of resources for specific processes in the custom resource profile.

Reserved resources specified in the application package can be changed by setting a custom resource profile. Only the CPU, memory, and vCPU resources can be changed. For the resource changes to take effect, stop and deactivate the application, then activate it and start it again.



**Note** Resource values are application-specific, and any adjustment to these values must ensure that the application can run reliably with the changes.

## Example

The following example shows how to change the allocation of resources of an application:

```
Device# configure terminal
Device(config)# application-hosting appid iox_app
Device(config-app-hosting)# resource profile custom cpu 7400 memory 2048 vcpu 2
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>app-hosting</b>	Initializes application hosting.
<b>app-hosting appid</b>	Enables application hosting and enters application hosting configuration mode.

## restconf access-list

To configure an access control list (ACL) for a RESTCONF session, use the **restconf access-list** command in global configuration mode. To remove the ACL, use the **no** form of this command.

```
restconf [{ipv4 | ipv6}]access-list name access-list-name
no restconf [{ipv4 | ipv6}]access-list [{name access-list-name}]
```

<b>Syntax Description</b>	<b>ipv4</b>	(Optional) Specifies RESTCONF IPv4 configuration parameters.
	<b>ipv6</b>	(Optional) Specifies RESTCONF IPv6 configuration parameters.
	<i>name</i>	(Optional) Access-list name.
<b>Command Default</b>	Clients connections are allowed.	
<b>Command Modes</b>	Global configuration (config)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.
<b>Usage Guidelines</b>	Clients that do not conform to the configured ACL are not allowed to connect to the network. You can use an access-list name that is not defined.	

### Example

The following example shows how to configure an IPv4 ACL for a RESTCONF session.:

```
Device# configure terminal
Device(config)# ip access-list standard ipv4_acl1_permit
Device(config-std-nacl)# permit 192.168.255.0 0.0.0.255
Device(config-std-nacl)# deny any
Device(config-std-nacl)# exit
Device(config)# restconf ipv4 access-list name ipv4_acl1_permit
Device(config)# end
```

The following example shows how to configure an IPv6 ACL for a RESTCONF session:

```
Device# configure terminal
Device(config)# ip access-list standard ipv6_acl1_permit
Device(config-std-nacl)# permit ipv6 2001:db8::1/32 any
Device(config-std-nacl)# deny any any
Device(config-std-nacl)# exit
Device(config)# restconf ipv6 access-list name ipv6_acl1_permit
Device(config)# end
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>deny</b>	Sets conditions in an IP/IPv6 access list that will deny packets.
<b>ip access-list</b>	Defines a standard IP access list and enters standard access-list configuration mode.
<b>ipv6 access-list</b>	Defines an IPv6 access list and enters IPv6 access list configuration mode.
<b>permit</b>	Sets conditions in an IP/IPv6 access list that will permit packets.

# run-opts

To specify or change the runtime Docker options, use the **run-opts** command in application-hosting docker configuration mode. To remove the runtime Docker options, use the **no** form of this command.

**run-opts** *options*  
**no run-opts** *options*

<b>Syntax Description</b>	<i>options</i>	Runtime Docker options.
---------------------------	----------------	-------------------------

**Command Default** Runtime options are not configured.

**Command Modes** Application-hosting docker configuration mode (config-app-hosting-docker)

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

**Usage Guidelines** You can add a maximum of 30 lines of runtime options. The system generates a concatenated string from line 1 though line 30. Each line can have a maximum of 235 characters. A string can have more than one Docker runtime option.

When a runtime option is changed, you need to stop, deactivate, activate, and start the application again for the new runtime options to take effect.

### Example

The following example shows how to configure runtime options:

```
Device> enable
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# app-resource docker
Device(config-app-hosting-docker)# run-opts 1 "-v $(APP_DATA)/data"
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>app-resource docker</b>	Enables the configuration of runtime Docker options.

# show app-hosting

To display application hosting-related information, use the **show app-hosting** command in privileged EXEC mode.

**show app-hosting** {**detail** [{**appid** *name*}] | **infra** | **list** | **resource** | **utilization** *appid name*}

Syntax Description	detail	Displays detailed information about the application.
	<b>appid</b> <i>name</i>	Displays detailed information about the specified application.
	<b>infra</b>	Displays infrastructure details about the application hosting framework.
	<b>list</b>	Displays information about the application or appliance.
	<b>resource</b>	Displays the available resources.
	<b>utilization</b>	Displays resource utilization information about the application/appliance.

**Command Modes** Privileged EXEC (#)

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

## Example

The following is sample output from the **show app-hosting detail** command:

```
Device# show app-hosting detail

App id           : perfsonar
Owner            : iox
State            : RUNNING
Application
  Type           : lxc
  Name           : perfsonar-lxc
  Version        : 1.0.0
  Description     : PerfSONAR 4.1 Cisco IOx LXC
Activated profile name : custom

Resource reservation
  Memory         : 2048 MB
  Disk           : 10 MB
  CPU            : 4000 units

Attached devices
  Type           Name                Alias
-----
serial/shell    iox_console_shell  serial0
serial/aux      iox_console_aux    serial1
serial/syslog   iox_syslog         serial2
serial/trace    iox_trace          serial3

Network interfaces
```

```
-----
eth0:
  MAC address      : 52:54:dd:38:a3:da
```

The following is sample output from the **show app-hosting infra** command:

```
Device# show app-hosting infra

App signature verification: disabled
```

The following is sample output from the **show app-hosting list** command:

```
Device# show app-hosting list

App id                State
-----
perfsonar             RUNNING
```

The following is sample output from the **show app-hosting resource** command:

```
Device# show app-hosting resource

Disk space:
  Total: 115300 MB
  Available: 111282 MB
Memory:
  Total: 2048 MB
  Available: 0 MB
CPU:
  Total: 7400 units
  Available: 3400 units
```

The following is sample output from the **show app-hosting utilization appid** command:

```
Device# show app-hosting utilization appid perfsonar

Application: perfsonar
CPU Utilization:
  CPU Allocation: 4000 units
  CPU Used:      0.01 %
Memory Utilization:
  Memory Allocation: 2048 MB
  Memory Used:     399112 KB
Disk Utilization:
  Disk Allocation: 10 MB
  Disk Used:      0.00 MB
```

All output fields are self-explanatory.

**Related Commands**

Command	Description
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
<b>resource profile</b>	Changes the application resource profile.



# show controller ethernet-controller AppGigabitEthernet

To display details about the application hosting AppGigabitEthernet controller interface, use the **show controller ethernet-controller AppGigabitEthernet** command in privileged EXEC mode.

**show controller ethernet-controller AppGigabitEthernet** *interface-number*

<b>Syntax Description</b>	<i>interface-number</i>	Interface number.
<b>Command Modes</b>	Privileged EXEC (#)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

## Usage Guidelines

### Example

The following sample output from the **show controller ethernet-controller AppGigabitEthernet interface-number** command:

```
Device# show controller ethernet-controller AppGigabitEthernet 1/0/1

Transmit                               AppGigabitEthernet1/0/1          Receive
0 Total bytes                          0 Total bytes
0 Unicast frames                       0 Unicast frames
0 Unicast bytes                        0 Unicast bytes
0 Multicast frames                     0 Multicast frames
0 Multicast bytes                      0 Multicast bytes
0 Broadcast frames                    0 Broadcast frames
0 Broadcast bytes                      0 Broadcast bytes
0 System FCS error frames              0 IpgViolation frames
0 MacUnderrun frames                  0 MacOverrun frames
0 Pause frames                        0 Pause frames
0 Cos 0 Pause frames                  0 Cos 0 Pause frames
0 Cos 1 Pause frames                  0 Cos 1 Pause frames
0 Cos 2 Pause frames                  0 Cos 2 Pause frames
0 Cos 3 Pause frames                  0 Cos 3 Pause frames
0 Cos 4 Pause frames                  0 Cos 4 Pause frames
0 Cos 5 Pause frames                  0 Cos 5 Pause frames
0 Cos 6 Pause frames                  0 Cos 6 Pause frames
0 Cos 7 Pause frames                  0 Cos 7 Pause frames
0 Oam frames                          0 OamProcessed frames
0 Oam frames                          0 OamDropped frames
0 Minimum size frames                 0 Minimum size frames
0 65 to 127 byte frames                0 65 to 127 byte frames
0 128 to 255 byte frames               0 128 to 255 byte frames
0 256 to 511 byte frames               0 256 to 511 byte frames
0 512 to 1023 byte frames              0 512 to 1023 byte frames
0 1024 to 1518 byte frames             0 1024 to 1518 byte frames
0 1519 to 2047 byte frames             0 1519 to 2047 byte frames
0 2048 to 4095 byte frames             0 2048 to 4095 byte frames
0 4096 to 8191 byte frames             0 4096 to 8191 byte frames
0 8192 to 16383 byte frames            0 8192 to 16383 byte frames
0 16384 to 32767 byte frame            0 16384 to 32767 byte frame
0 > 32768 byte frames                 0 > 32768 byte frames
```

```

0 Late collision frames
0 Excess Defer frames
0 Good (1 coll) frames
0 Good (>1 coll) frames
0 Deferred frames
0 Gold frames dropped
0 Gold frames truncated
0 Gold frames successful
0 1 collision frames
0 2 collision frames
0 3 collision frames
0 4 collision frames
0 5 collision frames
0 6 collision frames
0 7 collision frames
0 8 collision frames
0 9 collision frames
0 10 collision frames
0 11 collision frames
0 12 collision frames
0 13 collision frames
0 14 collision frames
0 15 collision frames
0 Excess collision frames

0 SymbolErr frames
0 Collision fragments
0 ValidUnderSize frames
0 InvalidOverSize frames
0 ValidOverSize frames
0 FcsErr frames

```

The output fields are self-explanatory.

**Related Commands**

Command	Description
<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.

# show gnxi state

To display Google RPC (gRPC) Network Operations Interface (gNOI)/gRPC Network Management/Operations Interface (gNXI) state information, use the **show gnxi state** command in privileged EXEC mode.

```
show gnxi state [{ detail | stats }]
```

## Syntax Description

**detail** (Optional) Displays detailed state information about the gNMI broker (GNMIB).

**stats** (Optional) Display GNMIB operational statistics.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced. This command replaces the <b>show gnmi-yang state</b> command.

## Example

The following is sample output from the **show gnxi state detail** command:

```
Device> enable
Device# show gnxi state detail

Settings
=====
  Server: Enabled
  Server port: 1024
  Secure server: Disabled
  Secure server port: 9339
  Secure client authentication: Disabled
  Secure trustpoint:
  Secure client trustpoint:
  Secure password authentication: Disabled

GNMI
====
  Admin state: Enabled
  Oper status: Up
  State: Provisioned

gRPC Server
-----
  Admin state: Enabled
  Oper status: Up

Configuration service
-----
  Admin state: Enabled
  Oper status: Up

Telemetry service
-----
  Admin state: Enabled
  Oper status: Up
```

```
GNOI
====

Cert Management service
-----
Admin state: Enabled
Oper status: Up

OS Image service
-----
Admin state: Disabled
Oper status: Up
Supported: Not supported on this platform
```

The output fields are self-explanatory.

The following is sample output from the **show gnxi state stats** command:

```
Device> enable
Device# show gnxi state stats

GNMI
====
Get: 1
Set: 1
Capabilities: 1
Subscribe: 0

GNOI CERT
=====
Get: 0
Install: 0
Rotate: 0
Revoke: 0
Cert CSR: 0

GNOI OS
=====
Install: 0
Activate: 1
Verify: 1
```

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

**Table 1: show gnxi state stats Field Descriptions**

Field	Description
GNMI	gNMI protocol information.
Get	Number of Get RPCs received.
Set	Number of Set RPCs received.
GNOI Cert	gNOI certificate information.
Install	Number of Install RPCs received.

Field	Description
Rotate	Number of Rotate RPCs received.
Revoke	Number of Revoke RPCs received.
Cert CSR	Number of Certificate Signing Requests (CSRs) received.
GNOI OS	GNOI OS installation service information.
Install	Number of Install RPC requests received.
Activate	Number of Activate RPC requests received.
Verify	Number of Verify RPC requests received.

**Related Commands**

Command	Description
<b>gnxi</b>	Enables gNXI.

# show install

To display information about data model update 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:</b>   <b>flash:</b>   <b>webui:</b> }		Specifies the location of the model update 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 non persistent.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Everest 16.5.1	This command was introduced on the following platforms: <ul style="list-style-type: none"> <li>• Cisco 4000 Series Integrated Services Routers</li> <li>• Cisco Catalyst 9300 Series Switches</li> <li>• Cisco Catalyst 9500 Series Switches</li> <li>• Cisco Cloud Services Router 1000v</li> <li>• Cisco Integrated Services Virtual Routers (ISRv)</li> </ul>
	Cisco IOS XE Everest 16.6.1	This command was implemented on the following platforms: <ul style="list-style-type: none"> <li>• Cisco Catalyst 3650 Series Switches</li> <li>• Cisco Catalyst 3850 Series Switches</li> </ul>

**Usage Guidelines**

Use the show commands to view the status of an installed model update package.

**Cisco 4000 Series Integrated Services Routers**

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

```
Device# show install package bootflash:
isr4300-universalk9.16.05.01.CSCxxxxxxx.dmp.bin

Name: isr4300-universalk9.16.05.01.CSCxxxxxxx.dmp.bin
Version: 16.5.1.0.199.1484082952..Everest
Platform: ISR4300
Package Type: dmp
Defect ID: CSCxxxxxxx
Package State: Added
Supersedes List: {}
Smu ID: 1
Device#
```

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

```
Device# show install summary

Active Packages:
bootflash:isr4300-universalk9.16.05.01.CSCxxxxxxx.dmp.bin
Inactive Packages:
No packages
Committed Packages:
No packages
Uncommitted Packages:
bootflash:isr4300-universalk9.16.05.01.CSCxxxxxxx.dmp.bin
Device#
```

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/isr4300-universalk9.16.05.01.CSCxxxxxxx.dmp.bin
Sun Feb 26 05:57:22 UTC 2017
[5|install_activate]: START Sun Feb 26 05:58:41 UTC 2017
```

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

**Table 2: show install summary Field Descriptions**

Field	Description
Active Packages	Name of the active model update package.
Inactive Packages	List of inactive packages.
Committed Packages	Installed model update packages that have saved or committed changes to the hard disk, so that the changes become persistent across reloads.

Field	Description
Uncommitted Packages	Model update package activations that are non persistent.

### Cisco Catalyst 3000 Series Switches

The following sample output from the **show install summary** command displays that the update package is now committed, and that it will be persistent across reloads:

```
Device# show install summary

Active Packages:
bootflash:cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
Inactive Packages:
No packages
Committed Packages:
bootflash:cat3k_caa-universalk9.16.06.01.CSCxxxxxxx.dmp.bin
Uncommitted Packages:
No packages
Device#
```

### Related Commands

Command	Description
<b>install</b>	Installs data model update packages.



# show iox-service

To display the status of all IOx services, use the **show iox-service** command in privileged EXEC mode.

**show iox-service** [{detail}]

<b>Syntax Description</b>	<b>detail</b>	(Optional) Displays detailed information about the application/appliance.
---------------------------	---------------	---

<b>Command Modes</b>	Privileged EXEC (#)
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Everest 16.5.1	This command was introduced.
	Cisco IOS XE Amsterdam 17.2.1	The output of the command was modified to display the cold restart synchronization information.

**Usage Guidelines** IOx is a Cisco-developed end-to-end application framework that provides application hosting capabilities for different application types on Cisco network platforms. Cisco application hosting framework (CAF) is an IOx Python process that manages virtualized and container applications that run on devices. To enable IOx, configure the **iox** command. After configuring this command, you can update the application hosting configuration.

IOXMAN is a process that establishes a tracing infrastructure to provide logging or tracing services for guest applications, except Libvirt, that emulates serial devices.

### Example

The following is sample output from the **show iox-service** command:

```
Device# show iox-service

IOx Infrastructure Summary:
-----
IOx service (CAF) 1.10.0.0 : Running
IOx service (HA)          : Running
IOx service (IOxman)     : Running
IOx service (Sec storage) : Not Running
Libvirtd 1.3.4           : Running
Dockerd 18.03.0          : Running
Application DB Sync Info : Available
Sync status               : Successful
Last application sync time: 2020-03-25 15:23:37.132829
```

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

**Table 3: show iox-service Field Descriptions**

Field	Description
IOx service (CAF)	Status of the Cisco Application Framework (CAF).

Field	Description
IOx service (HA)	Status of high availability. High availability must be running, if you have redundant hardware, like a redundant route processor (RP).
IOx service (IOxman)	Status of the IOx Manager.
Libvirtd	Status of the Linux Library Virtual daemon.
Sync status	Status of the IOx cold restart. Shows whether the synchronization was successful or not.
Last application sync time	Date and time when the last synchronization happened.

The following is sample output from the **show iox-service detail** command:

```

Device# show iox-service detail

IOx Infrastructure Summary:
-----
IOx service (CAF) 1.10.0.0 : Running
IOx service (HA)      : Running
IOx service (IOxman)  : Running
IOx service (Sec storage) : Not Running
Libvirtd 1.3.4      : Running
Dockerd 18.03.0     : Running
Application DB Sync Info : Available
Sync Status : Disabled

----- show platform software process list switch active r0 name caf
-----
Name: run_ioxn_caf.sh
  Process id      : 743
  Parent process id: 302
  Group id       : 743
  Status        : S
  Session id    : 9377
  User time     : 20
  Kernel time   : 10
  Priority      : 20
  Virtual bytes : 6459392
  Resident pages : 1420
  Resident limit : 18446744073709551615
  Minor page faults: 17234
  Major page faults: 0

----- show platform software process list switch active r0 name libvirtd
-----
Name: libvirtd.sh
  Process id      : 5839
  Parent process id: 1
  Group id       : 5839
  Status        : S
  Session id    : 5839
  User time     : 0
  Kernel time   : 0
  Priority      : 20
  Virtual bytes : 4067328
  Resident pages : 746

```

```
Resident limit : 18446744073709551615
Minor page faults: 246
Major page faults: 0
```

```
Name: libvirtd
Process id : 5862
Parent process id: 5839
Group id : 5839
Status : S
Session id : 5839
User time : 122
Kernel time : 202
Priority : 20
Virtual bytes : 1246498816
Resident pages : 3976
Resident limit : 18446744073709551615
Minor page faults: 2685
Major page faults: 31
```

```
----- show platform software process list switch active r0 name dockerd
-----
```

```
Name: dockerd
Process id : 8622
Parent process id: 7979
Group id : 8622
Status : S
Session id : 9377
User time : 1957
Kernel time : 1132
Priority : 20
Virtual bytes : 1824083968
Resident pages : 15276
Resident limit : 18446744073709551615
Minor page faults: 9515
Major page faults: 338
```

Device#

Related Commands	Command	Description
	<b>iox</b>	Configure IOx services.

# show log profile netconf-yang

To write NETCONF-YANG process logs to a file, use the **show log profile netconf-yang** command in privileged EXEC mode.

**show log profile netconf-yang internal**

<b>Syntax Description</b>	<b>internal</b>	Selects all debug logs.
	<b>Note</b>	This keyword for use by customer support.

<b>Command Modes</b>	Privileged EXEC (#)
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
		Cisco IOS XE Fuji 16.8.1

**Usage Guidelines** Logs are displayed on the device console when the command is executed.

## Example

The following is sample output from the **show log profile netconf-yang internal** command:

```
Device# show log profile netconf-yang internal

executing cmd on chassis local ...
Collecting files on current[local] chassis.

DECODER ERROR: NOTE: Tracelog may not be generated from clang binary, and is not encoded.
Please use native linux tools (vi/less/more/cat...) to read the file

2018/01/24 15:58:50.356 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): gdb port
9919 allocated
2018/01/24 15:58:50.365 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): swift_repl
port 8019 allocated
2018/01/24 15:58:50.422 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (info): (std):
cat: /tmp/sw/boot/boot_debug.conf: No such file or directory
2018/01/24 15:58:50.427 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (info): (std):
/usr/binos/conf/pman.sh: line 424: sigusr1_func: readonly function
2018/01/24 15:58:50.430 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
process scoreboard /tmp/rp/process/pttcd%rp_0_0%0 pttcd%rp_0_0%0.pid is 12040
2018/01/24 15:58:50.430 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
pttcd%rp_0_0%0.gdbport is 9919
2018/01/24 15:58:50.430 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
pttcd%rp_0_0%0.swift_replport is 8019
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (info): (std):
12040 (process ID) old priority 0, new priority 0
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
Launching pttcd on frp rp slot 0 bay 0 instance 0 log /tmp/rp/trace/pttcd_pmanlog
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
Hold failures 2, hold interval 1800
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
```

```

PATH is
/tmp/sw/rp/0/0/rp_daemons/mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:/tmp/sw/rp/0/0
/rp_daemons/mount/usr/binos/conf:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/sbin:/tmp/sw/rp/0/0
/rp_daemons/mount/usr/binos/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/cpp/bin:/usr/bin:/bin:/sbin:
/usr/binos/conf:/usr/binos/bin:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos
/conf:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf
2018/01/24 15:58:50.439 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
LD_LIBRARY_PATH is
2018/01/24 15:58:50.441 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
PREPROC_OPTIONS ==
2018/01/24 15:58:50.441 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
command line used pttcd >> /tmp/rp/trace/pttcd_pmanlog_cmd 2&>1 &
2018/01/24 15:58:50.444 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
full_path is /tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pttcd
2018/01/24 15:58:50.446 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
Resolved readlink process /tmp/sw/mount
/asr1000rpx86-rpcontrol.BLD_V168_THROTTLE_LATEST_20180122_164958_V16_8_0_177.SSA.pkg
/usr/binos/bin/pttcd
2018/01/24 15:58:50.446 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
Full path used to spawn the process: /tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pttcd
2018/01/24 15:58:50.452 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
Binary_arch set to: [x86_64_cge7]
2018/01/24 15:58:50.460 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (info): (std):
chmod: cannot access '/tmp/tmp/pub/tracekey_cache//tmp/sw/mount
/asr1000rpx86-rpcontrol.BLD_V16_8_0_177.SSA.pkg/usr/binos/bin/pttcd':
No such file or directory
2018/01/24 15:58:50.461 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): actual
pttcd pid is 12542
2018/01/24 15:58:50.461 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
Checking for cgroup for PID 12542
2018/01/24 15:58:50.461 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
/tmp/rp/pvp/process_state/pttcd%rp_0_0%0#12040_state marked up
2018/01/24 15:58:50.474 {pttcd_R0-0}{1}: [pttcd] [12542]: (ERR): init_callhome() failed
2018/01/24 15:58:50.475 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note): oom score
adj value is 399
2018/01/24 15:58:50.475 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (info): (std):
12040 (process ID) old priority 0, new priority -6
2018/01/24 15:58:50.475 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [12142]: (note):
Wait for signal or process exit: 12542
/harddisk/tracelogs/tmp_trace/pttcd_pmanlog_R0-0.12142_0.20180124155850.bin: DECODE(25:25:0:1)
2018/01/24 15:58:52.077 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): gdb port
9920 allocated
2018/01/24 15:58:52.085 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note): swift_repl
port 8020 allocated
2018/01/24 15:58:52.150 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (info): (std):
cat: /tmp/sw/boot/boot_debug.conf: No such file or directory
2018/01/24 15:58:52.153 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (info): (std):
/usr/binos/conf/pman.sh: line 424: sigusr1_func: readonly function
2018/01/24 15:58:52.157 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
process scoreboard /tmp/rp/process/pubd%rp_0_0%0 pubd%rp_0_0%0.pid is 14416
2018/01/24 15:58:52.157 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
pubd%rp_0_0%0.gdbport is 9920
2018/01/24 15:58:52.157 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
pubd%rp_0_0%0.swift_replport is 8020
2018/01/24 15:58:52.165 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (info): (std):
14416 (process ID) old priority 0, new priority 0
2018/01/24 15:58:52.166 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
Launching pubd on fru rp slot 0 bay 0 instance 0 log /tmp/rp/trace/pubd_pmanlog
2018/01/24 15:58:52.166 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
Hold failures 2, hold interval 1800
2018/01/24 15:58:52.166 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [14520]: (note):
PATH is
/tmp/sw/rp/0/0/rp_daemons/mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:/tmp/sw/rp/0/0
/rp_daemons/mount/usr/binos/conf:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/sbin:/tmp/sw/rp/0/0/rp_daemons/mount

```

```
/usr/binos/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/cpp/bin:/usr/bin:/bin:/sbin:/usr/binos/conf:/usr/binos/bin:  
/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf
```

# show log profile restconf

To write RESTCONF process logs to a file, use the **show log profile restconf** command in privileged EXEC mode.

**show log profile restconf internal**

<b>Syntax Description</b>	<b>internal</b> Selects all debug logs.
	<b>Note</b> This keyword for use by customer support.

<b>Command Modes</b>	Privileged EXEC (#)
----------------------	---------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Fuji 16.8.1	This command was introduced.

**Usage Guidelines** Logs are displayed on the device console when he command is executed.

### Example

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

```
Device# show log profile restconf internal

executing cmd on chassis local ...
Collecting files on current[local] chassis.
Total # of files collected = 17
Decoding files:
DECODER ERROR: NOTE: Tracelog may not be generated from clang binary, and is not encoded.
Please use native linux tools (vi/less/more/cat...) to read the file

2018/03/23 13:05:13.945 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): gdb port
9908 allocated
2018/03/23 13:05:13.962 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): swift_repl
port 8008 allocated
2018/03/23 13:05:14.041 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (info): (std):
cat:
/tmp/sw/boot/boot_debug.conf: No such file or directory
2018/03/23 13:05:14.046 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (info): (std):
/usr/binos/conf/pman.sh: line 424: sigusr1_func: readonly function
2018/03/23 13:05:14.050 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): process
scoreboard
/tmp/rp/process/pttcd%rp_0_0%0 pttcd%rp_0_0%0.pid is 2550
2018/03/23 13:05:14.050 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
pttcd%rp_0_0%0.gdbport is 9908
2018/03/23 13:05:14.050 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
pttcd%rp_0_0%0.swift_replport is 8008
2018/03/23 13:05:14.059 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (info): (std):
2550
(process ID) old priority 0, new priority 0
2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Launching
```

```

pttcd
on fru rp slot 0 bay 0 instance 0 log /tmp/rp/trace/pttcd_pmanlog
2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Hold
failures 2,
  hold interval 1800
2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): PATH is
/tmp/sw/rp/0/0/rp_daemons/mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/conf:
/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/sbin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin:
/tmp/sw/rp/0/0/rp_daemons/mount/usr/cpp/bin:/usr/bin:/bin:/sbin:/usr/binos/conf:/usr/binos/bin:/sbin:/bin:/usr/bin:
/usr/sbin:/usr/binos/conf:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf
2018/03/23 13:05:14.060 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
LD_LIBRARY_PATH is
2018/03/23 13:05:14.063 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
PREPROC_OPTIONS ==
2018/03/23 13:05:14.063 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): command
line used pttcd >>
/tmp/rp/trace/pttcd_pmanlog_cmd 2&>1 &
2018/03/23 13:05:14.068 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): full_path
is
/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pttcd
2018/03/23 13:05:14.069 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Resolved
readlink process
/tmp/sw/mount/asr1000rpx86-rpcontrol.2018-03-07_18.30_rifu.SSA.pkg/usr/binos/bin/pttcd
2018/03/23 13:05:14.069 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Full path
used to spawn the process:
/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pttcd
2018/03/23 13:05:14.076 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Binary_arch
set to: [x86_64_cge7]
2018/03/23 13:05:14.087 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (info): (std):
chmod: cannot access
'/tmp/tmp/pub/tracekey_cache//tmp/sw/mount/asr1000rpx86-rpcontrol.2018-03-07_18.30_rifu.SSA.pkg
/usr/binos/bin/pttcd': No such file or directory
2018/03/23 13:05:14.088 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): actual
pttcd pid is 2936
2018/03/23 13:05:14.088 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Checking
for cgroup for PID 2936
2018/03/23 13:05:14.088 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note):
/tmp/rp/pvp/process_state/pttcd%rp_0_0%#2550_state marked up
2018/03/23 13:05:14.097 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): oom score
adj value is 399
2018/03/23 13:05:14.102 {pttcd_R0-0}{1}: [pttcd] [2936]: (ERR): init_callhome() failed
2018/03/23 13:05:14.102 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (info): (std):
2550 (process ID) old priority 0, new priority -6
2018/03/23 13:05:14.102 {pttcd_pmanlog_R0-0}{1}: [pttcd_pmanlog] [2628]: (note): Wait for
signal or process exit: 2936
/harddisk/tracelogs/tmp_trace/pttcd_pmanlog_R0-0.2628_0.20180323130513.bin: DECODE(25:25:0:1)
2018/03/23 13:05:16.895 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): gdb port
9920 allocated
2018/03/23 13:05:16.904 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): swift_repl
port 8020 allocated
2018/03/23 13:05:16.978 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (info): (std):
cat: /tmp/sw/boot/boot_debug.conf: No such file or directory
2018/03/23 13:05:16.983 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (info): (std):
/usr/binos/conf/pman.sh: line 424: sigusr1_func: readonly function
2018/03/23 13:05:16.987 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): process
scoreboard
/tmp/rp/process/pubd%rp_0_0% pubd%rp_0_0%.pid is 4922

```



```

2018/03/23 13:05:16.987 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
pubd%rp_0_0%.gdbport is 9920
2018/03/23 13:05:16.987 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
pubd%rp_0_0%.swift_replport is 8020
2018/03/23 13:05:16.996 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (info): (std):
 4922 (process ID) old priority 0, new priority 0
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
  Launching pubd on fru rp slot 0 bay 0 instance 0 log /tmp/rp/trace/pubd_pmanlog
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): Hold failures
 2, hold interval 1800
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): PATH is
  /tmp/sw/rp/0/0/rp_daemons/mount/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/bin:/tmp/sw/rp/0/0/
rp_daemons/mount/usr/binos/conf:/tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/sbin:/tmp/sw/rp/0/0/
rp_daemons/mount/usr/binos/bin:/tmp/sw/rp/0/0/rp_daemons/mount/usr/cpp/bin:/usr/bin:/
bin:/sbin:/usr/binos/conf:/usr/binos/bin:/sbin:/bin:/usr/bin:/usr/sbin:/usr/binos/conf:/sbin:/bin:
  /usr/bin:/usr/sbin:/usr/binos/conf
2018/03/23 13:05:16.997 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
LD_LIBRARY_PATH is
2018/03/23 13:05:17.001 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
PREPROC_OPTIONS ==
2018/03/23 13:05:17.001 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): command
line used pubd >>
  /tmp/rp/trace/pubd_pmanlog_cmd 2&>1 &
2018/03/23 13:05:17.007 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note): full_path
is
  /tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pubd
2018/03/23 13:05:17.009 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
  Resolved readlink process /tmp/sw/mount/asr1000rpx86-rpcontrol.2018-03-07_18.30_rifu.SSA.pkg/
usr/binos/bin/pubd
2018/03/23 13:05:17.009 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
  Full path used to spawn the process: /tmp/sw/rp/0/0/rp_daemons/mount/usr/binos/bin/pubd
2018/03/23 13:05:17.017 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (note):
  Binary_arch set to: [x86_64_cge7]
2018/03/23 13:05:17.030 {pubd_pmanlog_R0-0}{1}: [pubd_pmanlog] [4998]: (info): (std): chmod:
cannot access
!
!
!

```

# show netconf-yang

To display information about NETCONF-YANG processes, use the **show netconf-yang** command in privileged EXEC mode.

```
show netconf-yang {datastores | sessions [{detail | session-id session-id] | statistics} [{R0 | R1 | RP {active | standby}}]
```

## Syntax Description

<b>datastores</b>	Displays information about NETCONF-YANG datastores.
<b>sessions</b>	Displays information about NETCONF-YANG sessions.
<b>detail</b>	(Optional) Displays detailed information about NETCONF-YANG sessions.
<b>session-id</b> <i>session-id</i>	(Optional) Displays information about the specified session. Valid values are from 1 to 4294967295.
<b>statistics</b>	Displays information about NETCONF-YANG statistics.
<b>R0</b>	(Optional) Displays information about the Route Processor (RP) slot 0.
<b>R1</b>	(Optional) Displays information about the RP slot 1.
<b>RP</b>	(Optional) Displays information about the RP.
<b>active</b>	(Optional) Displays information about the active instance of the RP.
<b>standby</b>	(Optional) Displays information about the standby instance of the RP.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1	This command was introduced.

## Usage Guidelines

This command displays information about global locks applied on the running datastore, candidate datastore, and startup datastore.

The **active** and **standby** keywords are only applicable to devices that supports both active and redundant route processors.

## Example

This sample output from the **show netconf-yang datastores** commands displays the sessions that have global locks:

```
Device# show netconf-yang datastores

Datastore Name           : running
Globally Locked By Session : 42
```

Globally Locked Time : 2018-01-15T14:25:14-05:00

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

**Table 4: show netconf-yang datastore Field Descriptions**

Field	Description
Datastore Name	Name of the datastore supported by the device.
Globally Locked By Session	Number of NETCONF-YANG sessions that have the lock on the running datastore.
Globally Locked Time	Time when a NETCONF-YANG session acquires the lock.

The following is sample output from the **show netconf-yang sessions** command:

```

Device# show netconf-yang sessions

R: Global-lock on running datastore
C: Global-lock on candidate datastore
S: Global-lock on startup datastore

Number of sessions : 10

session-id  transport      username      source-host      global-lock
-----
40          netconf-ssh    admin         10.85.70.224     None
42          netconf-ssh    admin         10.85.70.224     None
44          netconf-ssh    admin         10.85.70.224     None
46          netconf-ssh    admin         10.85.70.224     None
48          netconf-ssh    admin         10.85.70.224     None
50          netconf-ssh    admin         10.85.70.224     None
52          netconf-ssh    admin         10.85.70.224     None
54          netconf-ssh    admin         10.85.70.224     None
56          netconf-ssh    admin         10.85.70.224     None
58          netconf-ssh    admin         10.85.70.224     None
    
```

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

**Table 5: show netconf-yang sessions Field Descriptions**

Field	Description
session-id	Session identifier.
transport	Transport protocol used for session.
username	Client that is authenticated by the NETCONF-YANG system.
source-host	IP address of the client.
global-lock	True for sessions holding a global lock, and NONE, if there are no global locks.

This is sample output from the **show netconf-yang statistics** command:

```
Device# show netconf-yang statistics

netconf-start-time : 2018-01-15T12:51:14-05:00
in-rpcs             : 0
in-bad-rpcs        : 0
out-rpc-errors     : 0
out-notifications  : 0
in-sessions        : 10
dropped-sessions   : 0
in-bad-hellos      : 0
```

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

**Table 6: show netconf-yang statistics Field Descriptions**

Field	Description
netconf-start-time	Session establishment time.
in-rpcs	Total number of correct incoming RPCs.
in-bad-rpcs	Total number of incorrect incoming RPCs.
out-rpc-errors	Total number of RPC reply messages that indicate RPC errors.
out-notifications	Total number of outgoing notifications.
in-sessions	Total number of active NETCONF sessions.
dropped-sessions	Total number of dropped NETCONF sessions.

# show netconf-yang diagnostics

To display NETCONF-YANG diagnostics information, use the **show netconf-yang diagnostics** command in privileged EXEC mode.

**show netconf-yang diagnostics** { **summary** | { **all** | **last** | **message number** } [ **after** | **before** | **log** | **rollback** ] }

## Syntax Description

<b>summary</b>	Displays a summary of the NETCONF-YANG diagnostic information.
<b>all</b>	Displays all NETCONF-YANG diagnostic information.
<b>last</b>	Displays information about the last NETCONF RPC processed.
<b>message number</b>	Displays information about a specific NETCONF RPC message number.
<b>after</b>	(Optional) Displays the running configuration after a NETCONF RPC is processed.
<b>before</b>	(Optional) Displays the running configuration before a NETCONF RPC is processed.
<b>log</b>	(Optional) Displays the transaction logs for a NETCONF RPC.
<b>rollback</b>	(Optional) Displays information about the latest NETCONF rollback file.

## Command Modes

Privileged EXEC (#)

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

## Example

The following is sample output from the **show netconf-yang diagnostics summary** command:

```
Device# show netconf-yang diagnostics summary

Diagnostic Debugging is ON

Diagnostic Debugging Level: Maximum
Total Log Size (bytes): 20097
Total Transactions: 1

message      username      session-id    transaction-id  start-time      end-time
      log size
-----
1            admin         35            53              03/12/21 14:31:03  03/12/21
14:31:04     20097
```

The output fields are self-explanatory.

The following is sample output from the **show netconf-yang diagnostics last before** command:

```
Device# show netconf-yang diagnostics last before
----- Message 1 -----
----- Running-Config Before the NETCONF RPC -----

Building configuration...

Current configuration : 7207 bytes
!
! Last configuration change at 13:38:50 EDT Tue Sep 15 2020 by lab
!
version 17.5
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
service internal
service call-home
no platform punt-keepalive disable-kernel-core
platform shell
!
hostname host1
!
!
vrf definition Mgmt-vrf
.
.
.
```

**Related Commands**

Command	Description
<b>debug netconf-yang diagnostics</b>	Enables the debugging of NETCONF-YANG diagnostics.

# show openflow hardware capabilities

Effective with Cisco IOS XE Cupertino 17.7.1, the **show openflow hardware capabilities** command is not available in Cisco IOS XE software.

To display information about OpenFlow hardware capabilities, use the **show openflow hardware capabilities** command in privileged EXEC mode.

**show openflow hardware capabilities** [**{pipeline 1}**]

<b>Syntax Description</b>	<b>pipeline 1</b>	Displays information about the OpenFlow pipeline ID.
---------------------------	-------------------	--

**Command Modes** Privileged EXEC (#)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following is sample output from the **show openflow hardware capabilities** command:

```
Device# show openflow hardware capabilities

Max Interfaces: 1000
Aggregated Statistics: YES
Pipeline ID: 1
Pipeline Max Flows: 2322
Max Flow Batch Size: 100
Statistics Max Polling Rate (flows/sec): 10000
Pipeline Default Statistics Collect Interval: 5
Flow table ID: 0
Max Flow Batch Size: 100
Max Flows: 1022
Bind Subintfs: FALSE
Primary Table: TRUE
Table Programmable: TRUE
Miss Programmable: TRUE
Number of goto tables: 1
Goto table id: 1
Number of miss goto tables: 1
Miss Goto table id: 1
Stats collection time for full table (sec): 1
!
!
!
```

The following is sample output from the **show openflow hardware capabilities pipeline 1** command:

```
Device# show openflow hardware capabilities pipeline 1

Max Interfaces: 1000
Aggregated Statistics: YES
```

```

Pipeline ID: 1
Pipeline Max Flows: 128
Max Flow Batch Size: 100
Statistics Max Polling Rate (flows/sec): 10000
Pipeline Default Statistics Collect Interval: 5
    
```

```

Flow table ID: 0

Max Flow Batch Size: 100
Max Flows: 32
Bind Subintfs: FALSE
Primary Table: TRUE
Table Programmable: TRUE
Miss Programmable: TRUE
Number of goto tables: 1
Goto table id: 1
Number of miss goto tables: 1
Miss Goto table id: 1
Stats collection time for full table (sec): 1
    
```

Match Capabilities	Match Types
ethernet mac destination	bitmask
ethernet type	optional
VLAN ID	optional
in port (virtual or physical)	optional

Actions	Count	Limit	Order
set vlan id	1		10
push vlan tag	1		10
pop vlan tag	1		10
drop packet	1		10
perform another lookup in the specified table	1		10
forward pkt via the specific group	1		10
specified interface	64		10
controller	1		10
set input port	1		10

Miss actions	Count	Limit	Order
set vlan id	1		10
push vlan tag	1		10
pop vlan tag	1		10
drop packet	1		10
perform another lookup in the specified table	1		10
forward pkt via the specific group	1		10
specified interface	64		10
controller	1		10
set input port	1		10

```

Flow table ID: 1

Max Flow Batch Size: 100
Max Flows: 32
Bind Subintfs: FALSE
Primary Table: FALSE
Table Programmable: TRUE
Miss Programmable: TRUE
Number of goto tables: 2
Goto table id: 2 3
Number of miss goto tables: 1
    
```



```

Miss Goto table id: 2
Stats collection time for full table (sec): 1

      Match Capabilities  Match Types
-----
      ethernet mac destination      bitmask
      ethernet mac source          optional
      ethernet type                 optional
      VLAN ID                       optional
      in port (virtual or physical) optional

Actions      Count Limit  Order
-----
      set eth destination mac      1          10
      set vlan id                  1          10
      push vlan tag                1          10
      pop vlan tag                 1          10
      drop packet                  1          10
perform another lookup in the specified table 1          10
      forward pkt via the specific group 1          10
      specified interface          64         10
      controller                   1          10
      set input port               1          10
!
!
!

```

The output fields are self-explanatory.

# show openflow interface

Effective with Cisco IOS XE Cupertino 17.7.1, the **show openflow interface** command is not available in Cisco IOS XE software.

To display information about OpenFlow interfaces, use the **show openflow interface** command in privileged EXEC mode.

**show openflow interface**{[detail]}

<b>Syntax Description</b>	<b>detail</b>	Displays detailed administrative and operational state information.
---------------------------	---------------	---

**Command Modes** Privileged EXEC(#)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following is sample output from the **show openflow interface detail** command:

```
Device# show openflow interface detail

GigabitEthernet1/0/1, admin up, oper up
GigabitEthernet1/0/2, admin up, oper up
GigabitEthernet1/0/3, admin up, oper up
GigabitEthernet1/0/4, admin up, oper up
GigabitEthernet1/0/5, admin up, oper down
GigabitEthernet1/0/6, admin up, oper down
GigabitEthernet1/0/7, admin up, oper down
GigabitEthernet1/0/8, admin up, oper down
GigabitEthernet1/0/9, admin up, oper up
GigabitEthernet1/0/10, admin up, oper up
GigabitEthernet1/0/11, admin up, oper up
GigabitEthernet1/0/12, admin up, oper up
GigabitEthernet1/0/13, admin up, oper down
GigabitEthernet1/0/14, admin up, oper down
GigabitEthernet1/0/15, admin up, oper down
GigabitEthernet1/0/16, admin up, oper down
GigabitEthernet1/0/17, admin up, oper down
GigabitEthernet1/0/18, admin up, oper down
GigabitEthernet1/0/19, admin up, oper up
GigabitEthernet1/0/20, admin up, oper up
GigabitEthernet1/0/21, admin up, oper up
GigabitEthernet1/0/22, admin up, oper up
GigabitEthernet1/0/23, admin up, oper down
GigabitEthernet1/0/24, admin up, oper down
GigabitEthernet1/1/1, admin up, oper down
GigabitEthernet1/1/2, admin up, oper down
GigabitEthernet1/1/3, admin up, oper down
GigabitEthernet1/1/4, admin up, oper down
TenGigabitEthernet1/1/1, admin up, oper down
```

```
TenGigabitEthernet1/1/2, admin up, oper down
TenGigabitEthernet1/1/3, admin up, oper down
TenGigabitEthernet1/1/4, admin up, oper down
TenGigabitEthernet1/1/5, admin up, oper down
TenGigabitEthernet1/1/6, admin up, oper down
TenGigabitEthernet1/1/7, admin up, oper down
TenGigabitEthernet1/1/8, admin up, oper down
FortyGigabitEthernet1/1/1, admin up, oper down
FortyGigabitEthernet1/1/2, admin up, oper down
TwentyFiveGigE1/1/1, admin up, oper down
TwentyFiveGigE1/1/2, admin up, oper down
```

The output fields are self-explanatory.

# show openflow switch flows

Effective with Cisco IOS XE Cupertino 17.7.1, the **show openflow switch flows** command is not available in Cisco IOS XE software.

To display OpenFlow switch flows, use the **show openflow switch flows** command in privileged EXEC mode.

**show openflow switch** *number* **flows** [{**brief** | **list** | **summary** }][[**controller** ] | **default** | **del-pending** | **fixed** | **pending**][[**brief** | **list** | **summary** ]]

Syntax Description		
	<i>number</i>	OpenFlow switch number.
	<b>brief</b>	(Optional) Displays brief information about OpenFlow switch flows.
	<b>list</b>	Displays all flows; one flow entry per line.
	<b>summary</b>	Displays the count of flows.
	<b>configured</b>	Displays information about the configured flows.
	<b>controller</b>	Displayed information about the controller-programmed flows.
	<b>default</b>	Displays information about the default flows.
	<b>del-pending</b>	Displays information about flows that are scheduled to be deleted.
	<b>fixed</b>	Displays information about fixed flows.
	<b>pending</b>	Displays all pending flows.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.1	This command was introduced.
	Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following is sample output from the **show openflow switch** *number* **flows** **brief** command:

```

Device# show openflow switch 1 flows brief

Logical Switch Id: 1
Total flows: 10

Flow: 1 Match: any Actions: drop
      Priority: 0, Table: 0, Cookie: 0x0, Duration: 140.088s, Packets: 2, Bytes: 500

Flow: 2 Match: tcp,in_port=0,tp_src=1 Actions: output:1
      Priority: 11111, Table: 0, Cookie: 0x1, Duration: 130.642s, Packets: 0, Bytes: 0

Flow: 3 Match: any Actions: drop
      Priority: 0, Table: 1, Cookie: 0x0, Duration: 140.088s, Packets: 0, Bytes: 0

Flow: 4 Match: any Actions: drop
      Priority: 0, Table: 2, Cookie: 0x0, Duration: 140.088s, Packets: 0, Bytes: 0

Flow: 5 Match: any Actions: drop
      Priority: 0, Table: 3, Cookie: 0x0, Duration: 140.087s, Packets: 0, Bytes: 0

Flow: 6 Match: any Actions: drop
      Priority: 0, Table: 4, Cookie: 0x0, Duration: 140.087s, Packets: 0, Bytes: 0

Flow: 7 Match: any Actions: drop
      Priority: 0, Table: 5, Cookie: 0x0, Duration: 140.086s, Packets: 0, Bytes: 0

Flow: 8 Match: any Actions: drop
      Priority: 0, Table: 6, Cookie: 0x0, Duration: 140.086s, Packets: 0, Bytes: 0

Flow: 9 Match: any Actions: drop
      Priority: 0, Table: 7, Cookie: 0x0, Duration: 140.085s, Packets: 0, Bytes: 0

Flow: 10 Match: any Actions: drop
      Priority: 0, Table: 8, Cookie: 0x0, Duration: 140.085s, Packets: 0, Bytes: 0

Device#

```

The following is sample from the **show openflow switch *number* flows summary** command:

```

Device# show openflow switch 1 flows summary

Logical Switch Id: 1
Switch flow count: 10

```

The output fields are self-explanatory.

#### Related Commands

Command	Description
<b>feature openflow</b>	Enables the OpenFlow feature.
<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.

# show platform software fed active openflow

Effective with Cisco IOS XE Cupertino 17.7.1, the **show platform software fed active openflow** command is not available in Cisco IOS XE software.

To display OpenFlow information for the active instance of the Forwarding Engine Driver (FED), use the **show platform software fed active openflow** command in privileged EXEC mode.

**show platform software fed active openflow** {**error** {**brief** | **detail** | **event** *event-id*} | **flow** *flow-id* [{**detail**}] | **group** *group-id* [{**detail**}] | **status** | **table** {*table-id* {**priority** | **walk** [{**detail**}]}} | **mapping**}}

Syntax	Description
<b>error</b>	Displays information about error events.
<b>brief</b>	Displays brief information about all error events.
<b>detail</b>	Displays any details on the failures that happens during the installation of a flow, group, or any TFM request creation failures.
<b>event</b> <i>event-id</i>	Displays information about a specific event. Valid values for the <i>event-id</i> argument are from 1 to 4294967295.
<b>flow</b> <i>flow-id</i>	Displays information about the specified flow. Valid values for the <i>flow-id</i> argument are from 1 to 4294967295.
<b>group</b> <i>group-id</i>	Displays hardware information about flow groups. Valid values for the <i>group-id</i> argument are from 1 to 4294967295.
<b>status</b>	Displays statistics information on how many messages were installed, successful, and deleted.
<b>table</b> <i>table-id</i>	Displays information about OpenFlow tables. Valid values for the are from <i>table-id</i> 0 to 15.
<b>priority</b>	Display the priority distribution at each table.
<b>walk</b>	Displays the entire flow information for the specified table.
<b>Command Modes</b>	Privileged EXEC (#)

**Command History**

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

**Usage Guidelines**

On stackable switches, this command has the **switch** keyword, **show platform software fed switch active openflow** . On non-stackable switches, the **switch** keyword is not available.

**Example**

The following is sample output from the **show platform software fed switch openflow error event** command:

```
Device# show platform software fed switch active openflow error event 46

Date/Time: 2020/02/28 23:46:17.657
Event: 46
Type: Flow
Table: 3
Error Reason: Failed to detele flow (3)
Flow entry: [ ID: N/A, Cookie:0xf49dd3204d34ba77 Priority:8216 (0) Hardware: not-created
(hw = -1)]
Timeout: [Idle 0 Hard 0]
Destination MAC: 01:80:c2:00:00:00 | ff:ff:ff:00:00:00
VLAN: 4196 | 0x1fff
Action List: SET_GROUP_ID[100]
```

The following is sample output from the **show platform software fed switch openflow brief** command:

```
Device# show platform software fed active openflow brief

Event Type Codes: F - Flow, G - Group, T - Table Feature

Date/Time          Event  Type  Table  Error Reason
2020/02/18 05:15:06.000674    28    G     N/A    Group is not found
2020/02/18 02:47:28.000669    27    G     N/A    Group is not found
2020/02/18 01:52:10.000672    26    G     N/A    Group is not found
2020/02/18 01:48:41.000761    25    F      3    Failed to detele flow
2020/02/18 01:48:41.000761    24    F      3    Failed to detele flow
2020/02/18 01:48:41.000761    23    F      3    Failed to detele flow
2020/02/18 01:48:41.000761    22    F      3    Failed to detele flow
2020/02/18 01:48:41.000761    21    F      3    Failed to detele flow
2020/02/18 01:48:35.000758    20    F      3    Failed to detele flow
2020/02/18 01:48:35.000758    19    F      3    Failed to detele flow
2020/02/18 01:48:35.000758    18    F      3    Failed to detele flow
2020/02/18 01:48:35.000758    17    F      3    Failed to detele flow
2020/02/18 01:48:35.000758    16    F      3    Failed to detele flow
2020/02/18 01:48:28.000591    15    F      3    Failed to detele flow
2020/02/18 01:48:28.000591    14    F      3    Failed to detele flow
2020/02/18 01:48:28.000590    13    F      3    Failed to detele flow
2020/02/18 01:48:28.000590    12    F      3    Failed to detele flow
2020/02/18 01:48:28.000590    11    F      3    Failed to detele flow
2020/02/18 01:48:21.000753    10    F      3    Failed to detele flow
2020/02/18 01:48:21.000753     9    F      3    Failed to detele flow
2020/02/18 01:48:21.000753     8    F      3    Failed to detele flow
2020/02/18 01:48:21.000753     7    F      3    Failed to detele flow
2020/02/18 01:48:21.000753     6    F      3    Failed to detele flow
2020/02/18 01:43:24.000669     5    F      3    Failed to detele flow
```

```
2020/02/18 01:43:24.000669      4      F      3 Failed to detele flow
2020/02/18 01:43:24.000669      3      F      3 Failed to detele flow
2020/02/18 01:43:24.000669      2      F      3 Failed to detele flow
2020/02/18 01:43:24.000669      1      F      3 Failed to detele flow
```

The output fields are self-explanatory.

The following is sample output from the **show platform software fed switch active openflow flow detail** command:

```
Device# show platform software fed switch active openflow flow 1 detail

Flow entry: [ ID: 1, Cookie:0x0 Priority:0 (0) Hardware: created (hw = 510)]
Timeout: [Idle 0 Hard 0]
Action List:
  DROP
Statistics: Frames: 175 Bytes: 13650
Hardware Information:
Lookup Handle: 0xb600000d
Adjacency List Handle: 0xde00000d
Link ID: 2
Lookup Handle: 0x7f711c40a738
Extension Lookup Handle: 0x7f711c40a998
Adjacency List: 0xde00000d
Adjacency Handle: 0x1 [Special]
SI Allocated: No
SI Handle: 0x7f711c180168
RI Allocated: No
```

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

**Table 7: show platform software fed switch active openflow flow detail Field Descriptions**

Field	Description
Flow entry	Basic information about the flow.
Priority	Flow priority.
Hardware	Entry in the hardware in which the flow is installed.
Timeout	Idle timeout and hard timeout of the flow.
Action List	List of actions that apply to a packet if the packet matches the match fields of the flow.
Statistics	Frame and byte counters to which the flow is matched.

The following is sample output from the **show platform software fed active openflow table priority** command:

```
Device# show platform software fed switch active openflow table 1 priority

Table 1:  Level   Priority   Count
-----
           0         0         1
           1       4096         1
           2      20480         2
           3      20490         1
```



The following is sample output from the **show platform software fed active openflow status** command:

```
Device# show platform software fed active openflow status

Port enable messages ..... 0
Port disable messages ..... 0
Flow create messages ..... 18
Flow create errors ..... 0
Flow hardware create errors .. 0
Flow delete messages ..... 0
Flow delete errors ..... 0
Flow hardware delete errors .. 0
Group create messages ..... 0
Group create errors ..... 0
Group hardware create errors . 0
Group delete messages ..... 0
Group delete errors ..... 0
Group hardware delete errors . 0
```

```
Flow Table Status:
+-----+
| Table      | Flow Count |
+-----+
|          0 |          2 |
+-----+
|          1 |          1 |
+-----+
|          2 |          1 |
+-----+
|          3 |          1 |
+-----+
|          4 |          1 |
+-----+
|          5 |          1 |
+-----+
|          6 |          1 |
+-----+
|          7 |          1 |
+-----+
|          8 |          1 |
+-----+
|          9 |          0 |
+-----+
|         10 |          0 |
+-----+
|         11 |          0 |
+-----+
|         12 |          0 |
+-----+
|         13 |          0 |
```

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

**Table 8: show platform software fed active openflow status Field Descriptions**

Field	Description
Port enable messages	Number of port enable messages.

Field	Description
Port disable messages	Number of port disable messages.
Flow create messages	Number of flow create messages.
Flow hardware create errors	Number of flow hardware create errors.
Flow delete messages	Number of flow delete messages.
Flow delete errors	Number of flow delete errors.
Flow hardware delete errors	Number of flow hardware delete errors.
Group create messages	Number of group create messages.
Group create errors	Number of group create errors.
Group hardware create errors	Number of group hardware create errors.
Group delete messages	Number of group delete messages.
Group delete errors	Number of group delete errors.
Group hardware delete errors	Number of group hardware delete errors.

The following is sample output from the **show platform software fed active openflow table mapping** command:

```

Device# show platform software fed active openflow table mapping

Openflow Table to Hardware Table Mapping
-----
      Openflow                               Hardware
Table  Size  Match Capability          Table Width Type
  0     32  IN_PORT, VLAN, DL_DST, DL_TYPE  0A  SW  TCAM
  1     32  IN_PORT, VLAN, DL_SRC, DL_DST, DL_TYPE  1A  SW  TCAM
  2     32  VLAN, DL_DST                    2A  SW  TCAM
  3     32  IN_PORT, VLAN, DL_DST            3A  SW  TCAM

Hardware Table Information
-----
Table  Size  Ext. Size
  0A   256   32
  1A   256   32
  2A   256   32
  3A   256   32
    
```

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

**Table 9: show platform software fed active openflow table mapping Field Descriptions**

Field	Description
Openflow Table to Hardware Table Mapping	

Field	Description
Table	OpenFlow table.
Size	OpenFlow table size.
Match Capability	Match capability of the table.
Width	Key width of the lookup key associated with the table. It can be either single-wide or double-wide.
Type	The memory type that is used by the hardware for the lookup. It can be either Ternary Content Addressable Memory (TCAM) or Hash.
Hardware Table Information	
Table	Hardware table.
Size	The actual size in the hardware that is allocated for the table.
Ext. Size	Size of the hardware memory used for the extension lookup.

The following is sample output from the **show platform software fed active openflow table walk** command:

```
Device# show platform software fed active openflow table 1 walk

Table: 1 Flow Count: 5
Flow entry: [ ID: 5, Cookie:0x2a4e65f7c827dfaa Priority:20490 (3) Hardware: created (hw = 0)]
Timeout: [Idle 0 Hard 0]
Ethertype: 9000
Action List:
  DROP
Statistics: Frames: 0 Bytes: 0

Flow entry: [ ID: 6, Cookie:0x2a4e65f7c827dfaa Priority:20480 (2) Hardware: created (hw = 3)]
Timeout: [Idle 0 Hard 0]
Source MAC: ff:ff:ff:ff:ff:ff | ff:ff:ff:ff:ff:ff
Action List:
  DROP
Statistics: Frames: 0 Bytes: 0

Flow entry: [ ID: 7, Cookie:0x2a4e65f7c827dfaa Priority:20480 (2) Hardware: created (hw = 4)]
Timeout: [Idle 0 Hard 0]
Source MAC: 0e:00:00:00:00:01 | ff:ff:ff:ff:ff:ff
Action List:
  DROP
Statistics: Frames: 0 Bytes: 0

Flow entry: [ ID: 20, Cookie:0x2a4e65f7c827dfaa Priority:4096 (1) Hardware: created (hw = 250)]
Timeout: [Idle 0 Hard 0]
VLAN: 4196 | 0x1fff
```

```

Action List:
  CONTROLLER
  SET_TABLE_ID[2]
Statistics: Frames: 13 Bytes: 1098

Flow entry: [ ID: 2, Cookie:0x2a4e65f7c827dfaa Priority:0 (0) Hardware: created (hw = 252)]
Timeout: [Idle 0 Hard 0]
Action List:
  SET_TABLE_ID[2]
Statistics: Frames: 0 Bytes: 0

```

The output fields are self-explanatory.

#### Related Commands

Command	Description
<b>switch (OpenFlow)</b>	Configures a logical switch and pipeline, and enters OpenFlow switch configuration mode.

# show platform software yang-management process

To display the status of the software processes required to support NETCONF-YANG, use the **show platform software yang-management process** in privileged EXEC mode.

**show platform software yang-management process** [{ **monitor** [{ **switch** { *switch-number* | **active** | **standby** } **R0** }] | **switch** | { *switch-number* | **active** | **standby** } | **R0** ] }

Syntax Description		
	<b>monitor</b>	(Optional) Displays detailed information about processes that are running.
	<b>switch</b> <i>switch-number</i>	(Optional) Displays information about the specified switch.
	<b>active</b>	(Optional) Displays information about the active instance of the switch.
	<b>standby</b>	(Optional) Displays information about the standby instance of the switch.
	<b>R0</b>	(Optional) Displays information about the Route Processor (RP) slot zero.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Everest 16.3.1	This command was introduced.

## Examples

The following is sample output from the **show platform software yang-management process** command:

```
Device# show platform software yang-management process

confd           : Running
nesd            : Running
syncfd         : Running
ncsshd         : Running
dmiauthd       : Running
vtyserverutild : Running
opdatamgrd     : Running
nginx          : Running
ndbmand        : Running
```

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

**Table 10: show platform software yang-management process Field Descriptions**

Field	Description
confd	Configuration daemon
nesd	Network element synchronizer daemon
syncfd	Sync from daemon
nesshd	NETCONF Secure Shell (SSH) daemon
dmiauthd	Device management interface (DMI) authentication daemon
vtyservertild	VTY server util daemon
opdatamgrd	Operational Data Manager daemon
nginx	NGINX web server
ndbmand	NETCONF database manager

The following is sample output from the **show platform software yang-management process monitor** command:

```
Device# show platform software yang-management process monitor

COMMAND          PID S   VSZ  RSS %CPU %MEM  ELAPSED
nginx            24689 S 139328 11996 0.0 0.2 24-02:00:55
nginx            24695 S 146544 6824 0.0 0.1 24-02:00:55
```

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

**Table 11: show platform software yang-management process monitor Field Descriptions**

Field	Description
COMMAND	Command name
PID	Process ID
S	Process state
VSZ	Virtual memory size (in KB)
RSS	Resident set size (in KB)
%CPU	CPU usage percentage
%MEM	Memory usage percentage
ELAPSED	Elapsed execution time

**Related Commands**

Command	Description
show platform software yang-management process state	Displays the NETCONF-YANG process states.

# show platform software yang-management process state

To display the NETCONF-YANG process states, use the **show platform software yang-management process state** command in privileged EXEC mode.

**show platform software yang-management process state** [ **switch** { *switch-number* | **active** | **standby** } **R0** ]

Syntax Description		
<b>switch</b> <i>switch-number</i>		(Optional) Displays information about the specified switch.
<b>active</b>		(Optional) Displays information about the active instance of the switch.
<b>standby</b>		(Optional) Displays information about the standby instance of the switch.
<b>R0</b>		(Optional) Displays information about the Route Processor (RP) slot zero.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.5.1	This command was introduced in a release prior to Cisco IOS XE Bengaluru 17.5.1.

## Example

The following is sample output from the **show platform software yang-management process state** command:

```
Device# show platform software yang-management process state
```

```
Confd Status: Started
```

Process	Status	State
nesd	Running	Active
syncfd	Running	Active
ncsshd	Running	Not Applicable
dmiauthd	Running	Active
nginx	Running	Not Applicable
ndbmand	Running	Active
pubd	Running	Active
gnmib	Not Running	Not Applicable

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



Table 12: show platform software yang-management process state Field Descriptions

Field	Description
Confd Status	Configuration daemon
nesd	Network element synchronizer daemon
syncfd	Sync from daemon
ncsshd	NETCONF Secure Shell (SSH) daemon
dmiauthd	Device management interface (DMI) authentication daemon
nginx	NGINX web server
ndbmand	NETCONF database manager

**Related Commands**

Command	Description
<b>debug netconf-yang diagnostics</b>	Enables the debugging of NETCONF-YANG diagnostics.
<b>show platform software yang-management process</b>	Displays the status of the software processes required to support NETCONF-YANG.

# show telemetry connection

To display telemetry connection information, use the **show telemetry connection** command in privileged EXEC mode.

**show telemetry connection** { *index* { **brief** | **detail** | **subscription** } | **all** }

Syntax Description	
<i>index</i>	Connection index. Valid values are from 0 to 4294967294.
<b>brief</b>	Displays a brief summary of the connection information.
<b>detail</b>	Displays detailed connection information.
<b>subscription</b>	Displays all subscriptions that use this connection.
<b>all</b>	Displays all connection information.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.7.1	This command was introduced.

**Usage Guidelines** The output of the **show telemetry connection *index* subscription** command matches the output of the **show telemetry ietf subscription brief** command.

## Example

The following is sample output from the **show telemetry connection *index* detail** command:

```
Device# show telemetry connection 1 detail
Index           : 1
Peer Address    : 203.0.113.254
Port           : 34365
VRF            : 0
Source Address  : 0.0.0.0
Type           : PROTOCOL
State          : Active
Peer ID        : admin
Receiver Name   :
Transport      : netconf
Use Count      : 1
State change Time : 05/26/21 11:57:51
```

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

**Table 13: show telemetry connection detail Field Descriptions**

Field	Description
Index	Unique identifier for the connection.

Field	Description
Peer Address	IP address of the remote receiver.
Port	Remote port number on the receiver to which this connection is connected.
VRF	Virtual Routing and Forwarding (VRF) instance used by the connection.
Source Address	Local source address used by the connection.
Type	Receiver type. Currently <i>protocol</i> is the only supported receiver type.
State	State of the connection. The state can be active, connecting, pending, or disconnecting.
Peer ID	ID used by the remote receiver to authenticate itself. The ID can be removed, depending on the protocol that is used.
Receiver Name	Receiver name as configured by the <b>telemetry receiver</b> configuration command. This parameter is not set for legacy receivers.
Transport	Transport protocol used.
Use Count	Number of subscriptions that are currently using the connection.
State Change Time	Date and time of the last change to the connection state.

The following is sample output from the **show telemetry connection index subscription** command:

```
Device# show telemetry connection 1 subscription
ID      Type      State      State Description
1005    Configured Valid
1006    Configured Valid
```

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

```
Device# show telemetry connection all
Telemetry connections
Index Peer Address      Port  VRF  Source Address      State
-----
  1 192.0.2.2          57589 3    172.16.0.1          Connecting
  2 198.51.100.2      57588 3    172.16.0.1          Connecting
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show telemetry ietf subscription brief</b>	Displays a brief summary of the subscription information.
<b>telemetry receiver protocol</b>	Configures a named protocol receiver.

# show telemetry ietf subscription

To display information about telemetry subscriptions on a device, use the **show telemetry ietf subscription** command in privileged EXEC mode.

```
show telemetry ietf subscription { { { subscription-ID [ { receiver } ] | all | configured |
dynamic | permanent } | [ { brief | detail } ] } | summary }
```

Syntax Description		
	<i>subscription-ID</i>	Subscription ID. Valid values are from 0 to 4294967295.
	<b>receiver</b>	(Optional) Displays the receiver details for a subscription, including the IP address, port of the remote client, the transport protocol, and the connection state (connected, disconnected, or connecting).
	<b>all</b>	Displays all subscription information.
	<b>configured</b>	Displays a list of subscriptions configured through the command or NETCONF set config.
	<b>dynamic</b>	Displays information about dynamic subscriptions created using the <i>establish-subscription</i> RPC.
	<b>permanent</b>	Displays permanent subscription information.
	<b>brief</b>	(Optional) Displays a brief summary of the subscription information.
	<b>detail</b>	(Optional) Displays the subscription information in detail.
	<b>summary</b>	Displays a summary of all subscription information.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Everest 16.6.1	This command was introduced.
	Cisco IOS XE Gibraltar 16.12.1	This command was modified. The <b>receiver</b> keyword was added.
	Cisco IOS XE Cupertino 17.7.1	This command was modified. The <b>permanent</b> and <b>summary</b> keywords were added.

**Usage Guidelines** Use the **show telemetry ietf subscription** command or the *get* RPC to retrieve the list of current subscription details on a device.

The **summary** keyword highlights the number of subscriptions configured, and the maximum number of supported subscriptions. If the subscriptions exceed the maximum number, the additional subscriptions are ignored.

### Example

The following is sample output from the **show telemetry ietf subscription *subscription-ID* detail** command:

```
Device# show telemetry ietf subscription 2147483667 detail

Telemetry subscription detail:

Subscription ID: 2147483667
State: Valid
Stream: yang-push
Encoding: encode-xml
Filter:
  Filter type: xpath
  XPath: /mdt-oper:mdt-oper-data/mdt-subscriptions
Update policy:
  Update Trigger: periodic
  Period: 1000
Notes:
```

The following is sample output from the **show telemetry ietf subscription *subscription-ID* receiver** command:

```
Device# show telemetry ietf subscription 2147483649 receiver

Telemetry subscription receivers detail:

Subscription ID: 2147483649
Address: 10.85.181.2
Port: 45143
Protocol: gNMI
Profile:
State: Connected
Explanation:
```

The following is sample output from the **show telemetry ietf subscription dynamic brief** command:

```
Device# show telemetry ietf subscription dynamic brief

Telemetry subscription brief

ID                Type           State          Filter type
-----
2147483667        Dynamic        Valid          xpath
2147483668        Dynamic        Valid          xpath
2147483669        Dynamic        Valid          xpath
```

The following is sample output from the **show telemetry ietf subscription summary** command:

```
Device# show telemetry ietf subscription summary

Subscription Summary
```

```

=====
Maximum supported: 128

Subscription      Total      Valid      Invalid
-----
All                1          0          1
Dynamic           0          0          0
Configured        1          0          1
Permanent         0          0          0
    
```

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

**Table 14: show telemetry ietf subscription Field Descriptions**

Field	Description
Subscription ID	Subscription identifier.
State	Validity of a configured subscription.  State will always be valid for dynamic subscriptions. For example, a configured subscription can be in a half-configured state, and therefore invalid. However, if a dynamic establish subscription is invalid, an error RPC response is sent back, and the subscription will not appear in this table.
Stream	Type of streaming used for subscriptions. Only YANG-push is supported.
Encoding	Specifies encode-xml as the encoding type.
Filter Type	Type of filter used for subscriptions. Only XPath is supported.
XPath	XPath filter type or how the subscribed information was selected.
Update Trigger	Type of trigger used to update subscriptions.
Period	Periodic timer configured to trigger an update. Values are specified in centiseconds (1/100 of a second).
Notes	A brief explanation about why a subscription is invalid. But for dynamic subscriptions, this field will always be empty.
ID	Subscription ID.

# show telemetry internal connection

To display internal telemetry connection information, use the **show telemetry internal connection** command in privileged EXEC mode.

**show telemetry internal connection** *index* **detail**

<b>Syntax Description</b>	<i>index</i>	Connection index. Valid values are from 0 to 429496729.
	<b>detail</b>	Displays all the fields for the chosen connection.
<b>Command Modes</b>	Privileged EXEC (#)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.
	Cisco IOS XE Cupertino 17.7.1	This command was modified. The <b>detail</b> keyword was added.
<b>Usage Guidelines</b>	This command is not supported by all transport protocols.	

## Example

The following is sample output from the **show telemetry internal connection detail** command:

```
Device# show telemetry internal connection 4 detail

Telemetry protocol manager stats:

Con str           : 223.255.254.247:60251:0:0.0.0.0
Sockfd            : 71
Protocol          : netconf
State             : Credentials parsed
Version           : V1.1
Source ip         : 223.255.254.247
Bytes Sent        : 4712230
Msgs Sent         : 9010
Msgs Received     : 1
Bytes in queue    : 0
```

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

**Table 15: show telemetry internal connection detail Field Descriptions**

Field	Description
Con str	A string that describes the connection parameters used. This can include the source IP, source port, remote IP, and VRF. The exact format may vary based on the transport protocol.



Field	Description
Sockfd	ID of the internal file descriptor that is used for the connection.
Protocol	Transport protocol that is used by the connection.
State	Internal state of the connection as reported by the protocol manager.
Version	Protocol version.
Source ip	Source address of the connection.
Bytes Sent	Number of bytes sent by this connection since it became active.
Msgs Sent	Number of updates sent by this connection since it became active.
Msgs Received	Number of requests received by the connection since it became active. Depending on the protocol, this number can also be zero.
Bytes in queue	Number of bytes currently waiting to be sent to the remote receiver.

# show telemetry internal diagnostics

To display telemetry diagnostics information, use the **show telemetry internal diagnostics** command in privileged EXEC mode.

## show telemetry internal diagnostics

This command has no arguments or keywords.

<b>Command Modes</b>	Privileged EXEC (#)
----------------------	---------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

<b>Usage Guidelines</b>	This command displays all telemetry logs and operational states. When reporting problems or for troubleshooting, use this command as close to the problem time as possible and also provide the output of the <b>show running-config   section telemetry</b> command.
-------------------------	---

## Example

The following is sample output from the **show telemetry internal diagnostics** command:

```
Device# show telemetry internal diagnostics

Using 'chassis active' in show commands for platform.
=====

# show platform software trace message mdt-pubd chassis active R0 reverse

This command is being deprecated. Please use 'show logging process' command.
executing cmd on chassis 1 ...
Not enough available disk space in /bootflash to run this command.
Maximum used disk capacity of 90% for /bootflash exceeded. Aborting ...

=====
Getting configuration database records.

URI = /services;serviceName=mdt/mdt_subscriptions;subscription_id=1
subscription_id: '1'
base.stream: 'NETCONF' (d)
base.filter_type: 'SUB_FILTER_TYPE_NONE' (d)
base.no_filter: '0' (d)
base.xpath: 'null'
base.encoding: 'encode-xml' (d)
base.update_trigger: 'SUB_UPD_TRIG_NONE' (d)
base.no_trigger: '0' (d)
base.period: 'null'
base.no_synch_on_start: 'null'
base.source_vrf: 'null'
base.source_address: 'null'
base.tdl_uri: 'null'
base.transform_name: 'null'
base.nested_uri: 'null'
base.rcvr_type: 'RCVR_TYPE_UNSPECIFIED' (d)
```

```
permanent: 'null'

URI = /services;serviceName=mdt/mdt_subscriptions;subscription_id=1/
mdt_receivers;address=0A010101;port=98
protocol: 'grpc-tcp'
parent_mdt_subscriptions_key: '1'
profile: 'null'
address: '10.1.1.1'
port: '98'
```

```
URI = /services;serviceName=mdt/mdt_named_protocol_rcvr;name=p1
name: 'p1'
protocol: 'null'
profile: 'null'
host.type: 'HOST_TYPE_UNSPECIFIED' (d)
host.unspecified: 'false' (d)
host.address: 'null'
host.hostname: 'null'
port: 'null'
```

```
URI = /services;serviceName=mdt/mdt_named_protocol_rcvr;name=protol
name: 'protol'
protocol: 'PROT_RCVR_TLS_NATIVE'
profile: 'abcd'
host.type: 'HOST_TYPE_HOSTNAME'
host.unspecified: 'null'
host.address: 'null'
host.hostname: 'ancd'
port: '9'
```

=====

Getting details for subscription 1...

# show telemetry ietf subscription 1 detail

Telemetry subscription detail:

```
Subscription ID: 1
Type: Configured
State: Invalid
Stream: NETCONF
Filter:
  Filter type: not specified
  <none>
Update policy:
  Update Trigger: not specified
  <none>
Encoding: encode-xml
Source VRF:
Source Address:
Notes: Stream not supported
```

```
Legacy Receivers:
```

Address	Port	Protocol	Protocol Profile
10.1.1.1	98	grpc-tcp	

```
# show telemetry ietf subscription 1 receiver
```

```
Telemetry subscription receivers detail:
```

```
Subscription ID: 1
Address: 10.1.1.1
Port: 98
Protocol: grpc-tcp
Profile:
Connection: 65535
State: Invalid
Explanation: Subscription stream invalid
```

```
# show telemetry internal sensor subscription 1
```

```
=====  
Collecting internal connection information...
```

```
# show telemetry internal connection
```

```
=====  
Collecting internal subscription information...
```

```
# show telemetry internal subscription all stats
```

```
=====  
Collecting named receiver information...
```

```
Name: p1
Profile:
State: Invalid
Last State Change: 03/08/21 20:15:02
Explanation: Value 'unspecified' not supported for parameter 'protocol'.
Type: protocol
Protocol: unspecified
Host:
Port: 0
```

```
Name: protol
Profile: abcd
State: Valid
Last State Change: 03/08/21 03:06:47
Explanation:
Type: protocol
Protocol: tls-native
Host: ancd
Port: 9
```

```
=====  
Collecting stream sensor information...
```

```
# show telemetry internal sensor stream yang-push
```

```
# show telemetry internal sensor stream native
```

```
# show telemetry internal sensor stream yang-notif-native
```

```
=====
```

```
In addition: Please provide output of  
"show running-config | section telemetry"
```

```
=====
```

The output fields are self-explanatory.

# show telemetry internal sensor

To display internal telemetry sensor information, use the **show telemetry internal sensor** command in privileged EXEC mode.

```
show telemetry internal sensor { stream name | subscription id }
```

Syntax Description	stream <i>name</i>	Displays telemetry stream information.
	subscription <i>id</i>	Displays telemetry sensor subscription information.

**Command Modes** Privileged EXEC #

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.7.1	This command was introduced.

**Usage Guidelines** A sensor collects data from a single source. A single subscription might use multiple sensors, if the subscription data comes from multiple sources. This would typically happen when the XPath union operator is used in the subscription filter (for example /path1 or /path2).

A stream defines a set of events that can be subscribed to, and this set of events can be almost anything. For example, yang-push, yang-notif-native, and so on. The **stream *name*** keyword-argument pair in this command will display the sensors for all subscriptions on the specified stream.

## Example

The following is sample output from the **show telemetry internal sensor subscription** command:

```
Device# show telemetry internal sensor subscription 2147483658

Subscription ID: 2147483658
Sensor Type: yang-push periodic
Filter type: xpath
Filter selector: /wireless-access-point-oper:access-point-oper-data/radio-oper-data/
                 vap-oper-config/ssid
Data Collectors
DC: CEP periodic, SubFilter: /wireless-access-point-oper:access-point-oper-data/
                             radio-oper-data/vap-oper-config/ssid
```

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

**Table 16: show telemetry internal sensor subscription Field Descriptions**

Field	Description
Subscription ID	Subscription identifier.
Sensor Type	Type of sensor used for subscriptions.

Field	Description
Filter type	Type of filter used for subscriptions. Only XPath is supported.
Filter selector	The XPath that specifies the type of data to be sent by the subscription.
Data Collectors DC	Data collector used.

# show telemetry internal subscription

To display internal telemetry subscription information, use the **show telemetry internal subscription** command in privileged EXEC mode.

```
show telemetry internal subscription { all stats | id subscription-id stats } [ { connection
ip-ipv6-address peer-port [ { vrf ip-ipv6-address } ] ] ]
```

Syntax Description		
<b>all</b>		Displays all subscription information.
<b>stats</b>		Displays all subscription statistics.
<b>id</b> <i>subscription-id</i>		Displays information about the specified subscription ID.
<b>connection</b>		(Optional) Displays named receiver connection information.
<i>ip-ipv6-address</i>		(Optional) Peer IPv4 or IPv6 address.
<i>peer-port</i>		(Optional) Peer port number. Valid values are from 1 to 65535.
<i>vrf</i>		(Optional) Virtual routing and forwarding (VRF) name.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

**Usage Guidelines** If a subscription receiver is connected; but no updates are received, use this command to view whether the message drop count is incrementing.

## Example

The following is sample output from the **show telemetry internal subscription all stats** command:

```
Device# show telemetry internal subscription all stats
```

```
Telemetry subscription stats:
```

```
Subscription ID  Msgs Sent  Msgs Drop  Records Sent  Connection Info
```

```
-----
```

```
2147483651      2          0          0              admin
```

The output fields are self-explanatory.



# show telemetry receiver

To display the state of all telemetry receivers, use the **show telemetry receiver** command in privileged EXEC mode.

```
show telemetry receiver { all | name receiver-name [{ subscription }] }
```

Syntax Description		
<b>all</b>		Displays information about all named receivers.
<b>name</b> <i>receiver-name</i>		Displays information about the specified receiver.
<b>subscription</b>		(Optional) Displays all subscriptions that use this named receiver.

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

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.
	Cisco IOS XE Cupertino 17.7.1	This command was modified. The <b>subscription</b> keyword was added.

**Usage Guidelines**

Named receiver objects have two different operational states, valid or invalid. If the state is invalid, the output of this command provides an explanation on why the receiver is invalid. When the receiver state is valid, this field is empty.

The output of the **subscription** keyword displays a table of all the subscriptions that use the specified receiver. The output of this command should match the output of the **show telemetry ietf subscription brief** command.

## Example

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

```
Device# show telemetry receiver all

Telemetry receivers

Name      <...>      Type      Profile      State      Explanation
-----<...>-----
receiver1 <...>      protocol  tls-trustpoint  Valid
```

The following is sample output from the **show telemetry receiver name** command:

```
Device# show telemetry receiver name receiver1

Name: receiver1
Profile: tls-trustpoint
State: Valid
```

```

Last State Change: 08/12/20 19:55:54
Explanation:
Type: protocol
Protocol: tls-native
Host: rcvr.test.com
Port: 45000

```

The following is sample output from the **show telemetry receiver name subscription** command:

```

Device# show telemetry receiver name grpc-tcp subscription

ID          Type          State          State Description
1003        Configured    Valid
1004        Configured    Valid

```

The output fields are self-explanatory.

#### Related Commands

Command	Description
<b>receiver ip-address</b>	Configures telemetry subscription.
<b>receiver name</b>	Configures a named receiver in a subscription.
<b>show telemetry ietf subscription brief</b>	Displays a brief summary of the subscription information.
<b>telemetry receiver protocol</b>	Configures a named protocol receiver.

## source-address (telemetry)

To configure a source address for a subscription, use the **source-address** command in telemetry-subscription configuration mode. To remove the source address, use the **no** form of this command.

```
source-address { ip-address ipv6-address }
no source-address [{ ip-address ipv6-address }]
```

<b>Syntax Description</b>	<i>ip-address</i>	IPv4 address of the source.
	<i>ipv6-address</i>	IPv6 address of the source.
<b>Command Default</b>	Source address is not configured.	
<b>Command Modes</b>	Telemetry subscription configuration (config-mdt-subs)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

### Example

The following example shows how to configure a source address for a subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# source-address 2001:DB8::2
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>show telemetry receiver</b>	Displays the state of all telemetry receivers.
	<b>telemetry ietf subscription</b>	Configures telemetry subscription.

## source-vrf (telemetry)

To configure a source virtual routing and forwarding (VRF) instance for a subscription, use the **source-vrf** command in telemetry-subscription configuration mode. To remove the source VRF instance, use the **no** form of this command.

```
source-vrf vrf-name
no source-vrf [{ vrf-name }]
```

<b>Syntax Description</b>	<i>vrf-name</i>	Name of the VRF.
<b>Command Default</b>	Source VRF is not configured.	
<b>Command Modes</b>	Telemetry subscription configuration (config-mdt-subs)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

### Usage Guidelines

#### Example

The following example shows how to configure a source VRF for a subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# source-vrf vrf1
```

### Related Commands

Command	Description
<b>show telemetry receiver</b>	Displays the state of all telemetry receivers.
<b>telemetry ietf subscription</b>	Configures telemetry subscription.

## start (App Hosting)

To start or run an application, use the **start** command in application-hosting configuration mode. To stop the application, use the **no** form of this command.

**start**  
**no start**

This command has no arguments or keywords.

**Command Default** Starting of applications are not enabled.

**Command Modes** Application-hosting configuration mode (config-app-hosting)

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

**Usage Guidelines** You can either use the **start** command in privileged EXEC mode or the **app-hosting start appid application-name** command in application-hosting configuration mode.

To stop the app, you can either use the **no start** command in privileged EXEC mode or the **app-hosting stop appid application-name** command in application-hosting configuration mode.

### Example

The following example shows how to start an application:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# start
Device(config-app-hosting)# end
```

Related Commands	Command	Description
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>app-hosting start appid application-name</b>	Starts the application.

# statistics collection-interval

Effective with Cisco IOS XE Cupertino 17.7.1, the **statistics collection-interval** command is not available in Cisco IOS XE software.

To configure the collection interval for OpenFlow flow statistics, use the **statistics collection-interval** command in OpenFlow switch configuration mode. To disable the collection interval, use the **no** form of this command.

**statistics collection-interval** *collection-interval*  
**no statistics collection-interval**

<b>Syntax Description</b>	<i>collection-interval</i>	Flow statistics collection interval in seconds. Valid values are from 0 to 10.
---------------------------	----------------------------	--

**Command Default** Collection interval is not set.

**Command Modes** OpenFlow switch configuration (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

**Usage Guidelines** A value of zero seconds mean that flow statistics collection is disabled.

## Example

The following example shows how to configure the flow statistics collection interval:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# statistics collection-interval 9
```

Related Commands	Command	Description
	<b>feature openflow</b>	Enables the OpenFlow feature.
	<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
	<b>switch(OpenFlow)</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# stream

To configure a telemetry stream for a subscription, use the **stream** command in telemetry-subscription configuration mode.

```
stream { native | yang-notif-native | yang-push }
```

Syntax Description	Option	Description
	<b>native</b>	Configures a native stream.
	<b>yang-notif-native</b>	Configures a YANG-NOTIF-NATIVE stream.
	<b>yang-push</b>	Configures a YANG-push stream.

**Command Modes** Telemetry-subscription configuration (config-mdt-subs)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	Cisco IOS XE Bengaluru 17.6.1	This command was modified. The <b>native</b> , and <b>yang-notif-native</b> keywords were added.

**Usage Guidelines** Sources of telemetry data in a subscription are specified by the use of a stream and a filter. The term stream refers to a related set of events. RFC 5277 defines an event stream as a set of event notifications matching some forwarding criteria.

The *yang-notif-native* stream is any YANG notification in the publisher where the underlying source of events for the notification uses Cisco IOS XE native technology. This stream supports an XPath filter that specifies which notifications are of interest. Update notifications for this stream are sent only when events that the notifications are for occur.

The *yang-push* stream is the data in configuration and operational databases that is described by a supported YANG model. This stream supports an XPath filter to specify what data is of interest within the stream, and where the XPath expression is based on the YANG model that defines the data of interest. Update notifications for this stream may be sent either when data changes or at fixed periods, but not for both, for a given subscription. Subscriptions for data that does not currently exist are permitted, and these run as normal subscriptions.

### Example

The following example shows how to configure a telemetry stream for a subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# stream yang-push
```

Related Commands	Command	Description
	<b>telemetry ietf subscription</b>	Configures telemetry subscription.

# switch (OpenFlow)

Effective with Cisco IOS XE Cupertino 17.7.1, the **switch (OpenFlow)** command is not available in Cisco IOS XE software.

To configure a logical switch and enter OpenFlow switch configuration mode, use the **switch** command in OpenFlow configuration mode. To disable the logical switch configuration, use the **no** form of this command.

**switch 1 pipeline 1**  
**no switch 1 pipeline 1**

<b>Syntax Description</b>	<b>1</b>	Configures the OpenFlow logical switch ID.
	<b>pipeline 1</b>	Configures the OpenFlow pipeline ID.
<b>Command Default</b>	The OpenFlow logical switch is not configured.	
<b>Command Modes</b>	OpenFlow configuration (config-openflow)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Fuji 16.9.1	This command was introduced.
	Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following example shows how to configure a logical switch and pipeline:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)#
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>feature openflow</b>	Enables the OpenFlow feature.
	<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.



# switch pipeline

Effective with Cisco IOS XE Cupertino 17.7.1, the **switch pipeline** command is not available in Cisco IOS XE software.

To enable the OpenFlow logical switch and pipeline configuration, use the **switch pipeline** command in OpenFlow configuration mode. To disable the logical switch and pipeline configuration, use the **no** form of this command.

**switch** *switch\_ID* **pipeline** *pipeline\_ID*  
**no switch** *switch\_ID* **pipeline** *pipeline\_ID*

<b>Syntax Description</b>	<i>switch_ID</i>	OpenFlow switch ID.
	<i>pipeline_ID</i>	OpenFlow pipeline ID

**Command Default** The logical switch and pipeline are not enabled.

**Command Modes** OpenFlow configuration (config-openflow)

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
		Cisco IOS XE Fuji 16.9.1
	Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following example shows how to enable a logical switch and pipeline configuration:

```
Device# configure terminal
Device(config)# feature openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)#
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
		<b>feature openflow</b>

# telemetry ietf subscription

To configure telemetry subscription, use the **telemetry ietf subscription** command in global configuration mode. To disable the configuration, use the **no** form of this command.

```
telemetry ietf { subscription sub-id }
no telemetry ietf { subscription sub-id }
```

<b>Syntax Description</b>	<b>subscription</b> <i>sub-id</i> Configures a telemetry subscription. Valid values are from 0 to 2147483647.
---------------------------	---

<b>Command Modes</b>	Global configuration (config)
----------------------	-------------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

## Example

The following example shows how to configure an telemetry subscription:

```
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)#
```

# telemetry receiver protocol

To configure a named protocol receiver, use the **telemetry receiver protocol** command in global configuration mode. To remove a named protocol receiver, use the **no** form of this command.

**telemetry receiver protocol** *receiver-name*  
**no telemetry receiver protocol** *receiver-name*

<b>Syntax Description</b>	<i>receiver-name</i>	Name of the receiver by which it is identified in the system.
<b>Command Default</b>	A named protocol receiver is not configured.	
<b>Command Modes</b>	Global configuration (config)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

**Usage Guidelines**

Named protocol receivers are used to specify telemetry transports that use protocols.

When a named protocol receiver is created, it is not automatically connected to the receiver. The named protocol receiver must be requested by at least one subscription to create a connection to the receiver.

After you configure the **telemetry receiver protocol** command, the command mode changes to telemetry protocol-receiver configuration mode. You can configure the host and protocol name for the named receiver in this mode.

### Example

The following example shows how to configure a named protocol receiver:

```
Device> enable
Device# configure terminal
Device(config)# telemetry receiver protocol my-receiver
Device(config-mdt-protocol-receiver)#
```

Related Commands	Command	Description
	<b>host</b>	Specifies named receiver host details.
	<b>protocol</b>	Specifies a protocol for the named receiver.
	<b>show telemetry receiver</b>	Displays the state of all telemetry receivers.

# tls trustpoint

Effective with Cisco IOS XE Cupertino 17.7.1, the **tls-trustpoint** command is not available in Cisco IOS XE software.

To configure the OpenFlow switch Transport Layer Security (TLS) trustpoint, use the **tls trustpoint** command in OpenFlow switch configuration mode. To remove the TLS trustpoint, use the **no** form of this command.

**tls trustpoint local** *name* **remote** *name*  
**no tls trustpoint local** *name* **remote** *name*

Syntax Description		
	<b>local</b> <i>name</i>	Configures a local trustpoint.
	<b>remote</b> <i>name</i>	Configures a remote trustpoint.

**Command Default** TLS trustpoint is not configured.

**Command Modes** OpenFlow switch configuration (config-openflow-switch)

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was removed.

## Example

The following example shows how to configure a TLS trustpoint for an OpenFlow switch:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# tls trustpoint local local-tls remote remote-tls
```

Related Commands	Command	Description
	<b>feature openflow</b>	Enables the OpenFlow feature.
	<b>openflow</b>	Enables OpenFlow configuration and enters OpenFlow configuration mode.
	<b>switch(OpenFlow)</b>	Configures a logical switch and enters OpenFlow switch configuration mode.

# update-policy

To configure an update policy for a subscription, use the **update-policy** command in telemetry-subscription configuration mode.

```
update-policy {on-change | periodic period}
```

<b>Syntax Description</b>	<b>on-change</b> Enables on-change updates.	
	<b>periodic</b> <i>period</i> Enable periodic updates. Valid values are from 100 to 4294967295.	
<b>Command Default</b>	Update policy is not configured.	
<b>Command Modes</b>	Telemetry-subscription configuration (config-mdt-subs)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

## Example

The following example shows how to configure a periodic update policy for a subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# update-policy periodic 6000
Device(config-mdt-subs)#
```

The following example shows how to configure an on-change update policy for a subscription:

```
Device> enable
Device# configure terminal
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# update-policy on-change 4000
Device(config-update-onchange)#
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>telemetry ietf subscription</b>	Configures telemetry subscription.

## vcpu (App Hosting)

To change the virtual CPU (vCPU) allocated by the application, use the **vcpu** command in custom application resource profile configuration mode. To revert to the application-provided CPU quota, use the **no** form of this command.

**vcpu** *number*  
**no vcpu** {[ *number* ]}

<b>Syntax Description</b>	<i>number</i>	The vCPU count. Valid values are from 0 to 65535.
<b>Command Default</b>	Custom application resource profile configuration (config-app-resource-profile-custom)	
<b>Command Modes</b>	Custom application resource profile configuration (config-app-resource-profile-custom)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Fuji 16.9.1	This command was introduced.

**Usage Guidelines**

Within each application package, an application-specific resource profile is provided that defines the recommended CPU load, memory size, and number of virtual CPUs (vCPUs) required for the application. Use this command to change the allocation of resources for specific processes in the custom resource profile.

Reserved resources specified in the application package can be changed by setting a custom resource profile. Only the CPU, memory, and vCPU resources can be changed. For the resource changes to take effect, stop and deactivate the application, then activate it and start it again.



**Note** Resource values are application-specific, and any adjustment to these values must ensure that the application can run reliably with the changes.

### Example

The following example shows how to override the application-provided vCPU quota using a custom resource profile:

```
Device# configure terminal
Device(config)# app-hosting appid lxc_app
Device(config-app-hosting)# app-resource profile custom
Device(config-app-resource-profile-custom)# vcpu 2
```

Related Commands	Command	Description
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>app-resource profile</b>	Overrides the application-provided resource profile.

# vlan (App Hosting)

To configure a VLAN guest interface and enter application-hosting VLAN-access IP configuration mode, use the **vlan** command in application-hosting VLAN-access configuration mode. To remove the configuration, use the **no** form of this command.

**vlan** *vlan-ID* **guest-interface** *interface-number*  
**no vlan** *vlan-ID* **guest-interface** *interface-number*

<b>Syntax Description</b>	<i>vlan-ID</i>	VLAN ID of the front-panel port. Valid values are from 0 to 4094.
	<b>guest-interface</b> <i>interface-number</i>	Configures the guest interface. Valid values are for the <i>interface-number</i> argument are from 0 to 63.

**Command Default** Guest interface is not configured.

**Command Modes** Application-hosting trunk configuration (config-app-hosting-trunk)

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

**Usage Guidelines** When using the front-panel port as a VLAN interface, the application is connected to a specific VLAN network. A VLAN interface is created on the host and it is associated with the front-panel port *eth0* interface.

### Example

The following example shows how to configure a guest-interface for a front-panel trunk port:

```
Device# configure terminal
Device(config)# app-hosting appid lxc_app
Device(config-app-hosting)# app-vnic AppGigabitEthernet trunk
Device(config-config-app-hosting-trunk)# vlan 1 guest-interface 9
Device(config-config-app-hosting-vlan-access-ip)# guest-ipaddress 192.168.0.1
netmask 255.255.255.0
Device(config-config-app-hosting-vlan-access-ip)# end
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>app-hosting appid</b>	Configures an application and enters application hosting configuration mode.
	<b>app-vnic AppGigabitEthernet trunk</b>	Configures a front-panel trunk port for application hosting and enters application-hosting trunk configuration mode.
	<b>guest-ipaddress</b>	Configures a guest IP address.

## vnic gateway

To configure a gateway for a virtual network interface (vNIC), use the **vnic gateway** command in application hosting configuration mode. To remove the configuration, use the **no** form of this command.

```
vnic gateway VirtualPortGroup number guest-interface network-interface [guest-ipaddress ip-address] netmask netmask gateway ip-address [name-server ip-address] [default]
```

```
no vnic gateway [VirtualPortGroup number guest-interface network-interface ]
```

Syntax Description	VirtualPortGroup <i>number</i>	Configures a VirtualPortGroup interface for the gateway.
	<b>guest-interface</b> <i>network-interface</i>	Configures a guest interface for the gateway.
	<b>guest-ipaddress</b> <i>ip-address</i>	(Optional) Configures an IP address for the guest interface.
	<b>netmask</b> <i>netmask</i>	(Optional) Specifies the subnet mask for the guest IP address.
	<b>gateway</b> <i>ip-address</i>	(Optional) Configures an IP address for the vNIC gateway.
	<b>name-server</b> <i>ip-address</i>	(Optional) Configures an IP address for the Domain Name System (DNS) server.
	<b>default</b>	(Optional) Configures the default gateway.

**Command Default** vNIC gateway is not configured.

**Command Modes** Application hosting configuration (config-app-hosting)

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

### Example

The following example shows how to configure a vNIC gateway:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# vnic gateway1 VirtualPortGroup 0 guest-interface 1
guest-ipaddress 10.0.0.3 netmask 255.255.255.0 gateway 10.0.0.1 name-server 10.2.2.2
```

Related Commands	Command	Description
	<b>app-hosting appid</b>	Enables application hosting and enters application hosting configuration mode.



# vnic management

To configure an application management network for a virtual network interface (vNIC), use the **vnic management** command in application hosting configuration mode. To remove the configuration, use the **no** form of this command.

```
vnicmanagementguest-interface network-interface {guest-ipaddress ip-address} netmask netmask gateway
ip-address [{name-server ip-address}] [{default}]
no vnic management [{guest-interface network-interface}]
```

Syntax Description		
<b>guest-interface</b> <i>network-interface</i>		Configures a guest interface for the gateway.
<b>guest-ipaddress</b> <i>ip-address</i>		(Optional) Configures an IP address for the guest interface.
<b>netmask</b> <i>netmask</i>		(Optional) Specifies the subnet mask for the guest IP address.
<b>gateway</b> <i>ip-address</i>		(Optional) Configures an IP address for the vNIC gateway.
<b>name-server</b> <i>ip-address</i>		(Optional) Configures an IP address for the Domain Name System (DNS) server.
<b>default</b>		(Optional) Configures the default gateway.

**Command Default** An application management network is not configured.

**Command Modes** Application hosting configuration (config-app-hosting)

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

## Usage Guidelines

### Example

The following example shows how to configure a vNIC application management network:

```
Device# configure terminal
Device(config)# app-hosting appid iox_app
Device(config-app-hosting)# vnic management guest-interface 0 guest-ipaddress
172.19.0.24 netmask 255.255.255.0 gateway 172.19.0.23 default
```

Command	Description
<b>app-hosting appid</b>	Enables application hosting and enters application hosting configuration mode.

