



## **Programmability Command Reference, Cisco IOS XE Gibraltar 16.11.x**

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### **Americas Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883





## CONTENTS

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### CHAPTER 1

<b>Programmability</b>	<b>1</b>
boot ipxe	3
boot manual	4
boot system	5
clear configuration lock	6
clear netconf-yang session	7
clear telemetry ietf subscription	8
controller (OpenFlow)	10
datapath-id	12
dataplane-default	13
debug netconf-yang	14
debug restconf	15
default-miss	17
default boot	18
dig	19
encoding	21
feature openflow	22
filter xpath	23
guestshell	24
guestshell portforwarding	25
install	27
iox	32
logging flow-modify	33
max-backoff	34
mlog	35
monitor log profile netconf-yang	36

monitor log profile restconf	39
net-dhcp	42
net-debug	43
net-show	45
net-tcp-bufs	46
net-tcp-mss	47
net6-dhcp	48
net6-show	49
netconf legacy	50
netconf-yang ssh	51
ping	53
ping4	54
ping6	55
probe-interval	56
protocol-version	57
receiver	58
restconf access-list	59
show install	61
show iox-service	64
show log profile netconf-yang	67
show log profile restconf	70
show netconf-yang	73
show openflow hardware capabilities	76
show openflow interface	79
show openflow switch flows	81
show platform yang-management process	83
show telemetry ietf subscription	85
statistics collection-interval	88
stream	89
switch (OpenFlow)	90
switch pipeline	91
telemetry ietf subscription	92
tls trustpoint	93
update-policy	94



# Programmability

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- [boot ipxe](#), on page 3
- [boot manual](#), on page 4
- [boot system](#), on page 5
- [clear configuration lock](#), on page 6
- [clear netconf-yang session](#), on page 7
- [clear telemetry ietf subscription](#), on page 8
- [controller \(OpenFlow\)](#), on page 10
- [datapath-id](#), on page 12
- [dataplane-default](#), on page 13
- [debug netconf-yang](#), on page 14
- [debug restconf](#), on page 15
- [default-miss](#), on page 17
- [default boot](#), on page 18
- [dig](#), on page 19
- [encoding](#), on page 21
- [feature openflow](#), on page 22
- [filter xpath](#), on page 23
- [guestshell](#), on page 24
- [guestshell portforwarding](#), on page 25
- [install](#), on page 27
- [iox](#), on page 32
- [logging flow-modify](#), on page 33
- [max-backoff](#), on page 34
- [mlog](#), on page 35
- [monitor log profile netconf-yang](#), on page 36
- [monitor log profile restconf](#), on page 39
- [net-dhcp](#), on page 42
- [net-debug](#), on page 43
- [net-show](#) , on page 45
- [net-tcp-bufs](#), on page 46
- [net-tcp-mss](#), on page 47
- [net6-dhcp](#), on page 48
- [net6-show](#), on page 49

- netconf legacy, on page 50
- netconf-yang ssh, on page 51
- ping, on page 53
- ping4, on page 54
- ping6, on page 55
- probe-interval, on page 56
- protocol-version , on page 57
- receiver, on page 58
- restconf access-list, on page 59
- show install, on page 61
- show iox-service, on page 64
- show log profile netconf-yang, on page 67
- show log profile restconf, on page 70
- show netconf-yang , on page 73
- show openflow hardware capabilities, on page 76
- show openflow interface, on page 79
- show openflow switch flows, on page 81
- show platform yang-management process, on page 83
- show telemetry ietf subscription, on page 85
- statistics collection-interval, on page 88
- stream, on page 89
- switch (OpenFlow), on page 90
- switch pipeline, on page 91
- telemetry ietf subscription, on page 92
- tls trustpoint, on page 93
- update-policy, on page 94

# 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.
<b>Usage Guidelines</b>	<p>You can delete dynamic subscriptions by using the <b>clear telemetry ietf subscription</b> command, the &lt;kill-subscription&gt; RPC, and the in-band &lt;delete subscription&gt; RPC.</p> <p>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.</p>	

## 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)

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.

## 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.

## 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.

# datapath-id

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

<i>value</i>	A 64-bit hexadecimal value in the range 0x1 to 0xffffffffffffff.
--------------	--

## 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.

## Usage Guidelines

### 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

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.

## Usage Guidelines

### 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
```

# 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-miss

To specify the behavior of a packet, if it does not match any controller-installed flows, use the **default-miss** command in OpenFlow switch configuration mode. To disable the settings, use the **no** form of this command.

```
default-miss {continue-controller |continue-drop |drop}
no default-miss
```

## Syntax Description

**continue-controller**

**continue-drop**

**drop**

## Command Default

### Command Modes

OpenFlow switch configuration (config-openflow-switch)

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

## Usage Guidelines

### Example

The following example shows how to configure this command:

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# default-miss drop
```

## 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.

# 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.

<b>Usage Guidelines</b>	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.



# encoding

To configure telemetry encoding for the subscription, use the **encoding** command in telemetry-subscription configuration mode. To disable the configuration, use the **no** form of this command.

```
encoding encode-kvgpb
no encoding encode-kvgpb
```

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

<b>Command Modes</b>	Telemetry-subscription 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 a telemetry encoding for the subscription:

```
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# encoding encode-kvGPB
```

# feature openflow

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.

**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 xpath

To configure XPath filter, use the **filter xpath** command in telemetry-subscription configuration mode. To disable the configuration, use the **no** form of this command.

```
filter xpath path
nofilter xpath path
```

<b>Syntax Description</b>	<i>path</i>	Specifies XPath filter.
<b>Command Modes</b>	Telemetry-subscription configuration (config)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
<b>Usage Guidelines</b>	<p>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.</p> <p>The dataset within the yang-push stream to be subscribed to is specified by the use of an XPath filter.</p>	

## Example

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

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

# 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

<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.

# 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 {all   none}</b>	(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	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

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)

Command History	Release	Modification
	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
```

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

# logging flow-modify

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.

## Usage Guidelines

### 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.

# max-backoff

**max-backoff** *seconds*

**no max-backoff**

<b>Syntax Description</b>	<i>seconds</i>	Max-backoff time in seconds. The default is 8.
---------------------------	----------------	--

**Command Default** 8 seconds.

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

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

## Usage Guidelines

### Example

The following example shows how to .....

```
Device# configure terminal
Device(config)# feature openflow
Device(config)# openflow
Device(config-openflow)# switch 1 pipeline 1
Device(config-openflow-switch)# max-backoff 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.

# 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

<b>Syntax Description</b>	<p><b>internal</b> Displays all debug logs.</p> <p><b>Note</b> This keyword is mainly used by customer support.</p>
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<b>Command Modes</b>	Privileged EXEC (#)
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<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Cisco IOS XE Fuji 16.8.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Cisco IOS XE Fuji 16.8.1	This command was introduced.
Release	Modification				
Cisco IOS XE Fuji 16.8.1	This command was introduced.				

<b>Usage Guidelines</b>	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>	<p><b>internal</b> Displays all debug logs.</p> <p><b>Note</b> This keyword is used by customer support.</p>				
<b>Command Modes</b>	Privileged EXEC (#)				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Cisco IOS XE Fuji 16.8.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Cisco IOS XE Fuji 16.8.1	This command was introduced.
Release	Modification				
Cisco IOS XE Fuji 16.8.1	This command was introduced.				
<b>Usage Guidelines</b>	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%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
```

# 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.

**Usage Guidelines** 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**

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<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-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

This 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**

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



# 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.

**Usage Guidelines** You can set the MSS of TCP buffers using the *mss* 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.

**Usage Guidelines** Use the *mss* 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
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<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:dff:fe08:7ebd MAC 30:f7:0d:08:7e:bd
    
```

### Related Commands

Command	Description
net-show	Displays network parameters.

# 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)

---

Command History	Release	Modification
	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
Devcie# configure terminal
Device(config)# no netconf legacy
```

# 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.



# 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, rommon mode.

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

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

Command Modes	Rommon
---------------	--------

Command History	Release	Modification
	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:dead:beef:cafe::5 6 1000

Ping host 2001:dead:beef:cafe::5, 6 times, 1000 bytes
Pinging 2001:dead:beef:cafe::5 ... reply in 0 ms
Pinging 2001:dead:beef:cafe::5 ... reply in 1 ms
Pinging 2001:dead:beef:cafe::5 ... reply in 1 ms
Pinging 2001:dead:beef:cafe::5 ... reply in 0 ms
Pinging 2001:dead:beef:cafe::5 ... reply in 0 ms
Pinging 2001:dead:beef:cafe::5 ... reply in 0 ms
```

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

# probe-interval

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**

## Syntax Description

*seconds*

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.

## Usage Guidelines

### 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-version

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.

## Usage Guidelines

### 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 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 receiver IP address.
<i>ipv4-address</i>   <i>ipv6-address</i>	IPv4 or IPv6 receiver address.
<i>port</i>	Configures receiver port.
<b>protocol</b> <i>protocol</i>	Configures protocol for notification. The following protocol is supported: <ul style="list-style-type: none"> <li>• <b>grpc-tcp</b></li> </ul>

## Command Modes

Telemetry-subscription configuration (config)

## Command History

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

## Usage Guidelines

A receiver is a network element that receives the telemetry data. Configured subscriptions are created by management operations on the publisher by controllers, and explicitly include the specification of the receiver of the telemetry data defined by the subscription. These subscriptions persist across reboots of the publisher.

Configured subscriptions can be configured with multiple receivers, however; only the first valid receiver is used. Other receivers are not be tried, if a receiver is already connected, or in the process of being connected. If that receiver is deleted, another receiver is connected.

## Example

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

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

# 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}]
```

Syntax Description		
<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.	

**Command Default** Clients 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 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.



# 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:   flash:   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 1: 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 (#)	
<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>	<p>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 <b>iox</b> command.</p> <p>IOXMAN is a process that establishes a tracing infrastructure to provide logging or tracing services for guest applications, except Libvirt, that emulates serial devices.</p> <p>After configuring this command, you can update the application hosting configuration.</p>	

## Example

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

```
Device# show iox-service

IOx Infrastructure Summary:
-----
IOx service (CAF)      : Running
IOx service (HA)      : Running
IOx service (IOxman)  : Running
Libvirtd               : Running
```

The table below lists the fields shown in the display.

**Table 2: show iox-service Field Descriptions**

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

Field	Description
Libvirtd	Status of the Linux Library Virtual daemon.

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

```
Device# show iox-service detail
```

```
IOx Infrastructure Summary:
```

```
-----
IOx service (CAF)      : Running
IOx service (HA)      : Running
IOx service (IOxman)  : Running
Libvirtd              : Running
```

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

```
-----
Name: run_ioxn_caf.sh
  Process id       : 28445
  Parent process id: 28155
  Group id         : 28445
  Status           : S
  Session id       : 9123
  User time        : 5
  Kernel time      : 2
  Priority          : 20
  Virtual bytes    : 19939328
  Resident pages   : 1036
  Resident limit   : 18446744073709551615
  Minor page faults: 4833
  Major page faults: 0
```

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

```
-----
Name: libvirtd.sh
  Process id       : 5757
  Parent process id: 1
  Group id         : 5757
  Status           : S
  Session id       : 5757
  User time        : 0
  Kernel time      : 0
  Priority          : 20
  Virtual bytes    : 18661376
  Resident pages   : 692
  Resident limit   : 18446744073709551615
  Minor page faults: 208
  Major page faults: 0
```

```
Name: libvirtd
  Process id       : 5782
  Parent process id: 5757
  Group id         : 5757
  Status           : S
  Session id       : 5757
  User time        : 6
  Kernel time      : 74
  Priority          : 20
```

```
Virtual bytes      : 883945472
Resident pages    : 2122
Resident limit    : 18446744073709551615
Minor page faults: 2398
Major page faults: 59
```

---

**Related Commands**

Command	Description
iox	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>	<p><b>internal</b> Selects all debug logs.</p> <p><b>Note</b> This keyword for use by customer support.</p>
---------------------------	---

<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 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

excuting 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/bin/os/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% 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]: (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 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 15:58:50.460 {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%#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% 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 15:58:52.165 {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 (#)
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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 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% 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 13:05:14.059 {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%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 13:05:16.996 {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 3: show netconf-yang datastores Field Descriptions**

Field	Description
Dastore 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 4: 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 5: 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 openflow hardware capabilities

To display information about OpenFlow hardware capabilities, use the **show openflow hardware capabilities** command in privileged EXEC mode.

**show openflow hardware capabilities** [{pipeline 1}]

Syntax Description	pipeline 1	Displays information about the OpenFlow pipeline ID.
--------------------	------------	--

**Command Modes** Privileged EXEC (#)

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

## Usage Guidelines

### 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

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.

## Usage Guidelines

### 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

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		
<b>number</b>	<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.

## 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 yang-management process

To display the status of the software processes required to support NETCONF-YANG, use the **show platform yang management process** in privileged EXEC mode.

**show platform 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.

## Usage Guidelines

### 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 6: 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
vtyservutild	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 7: 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



# show telemetry ietf subscription

To display information about telemetry subscriptions on a device, use the **show telemetry ietf subscription** command in user EXEC or privileged EXEC mode.

**show telemetry ietf subscription** {*subscription-ID* | **all** | **configured** | **dynamic**} [{**brief** | **detail**}]

Syntax Description		
	<i>subscription-ID</i>	Subscription ID. Valid values are from 0 to 4294967295.
	<b>all</b>	Displays all subscription information.
	<b>configured</b>	Displays a list of subscriptions configured via CLI or NETCONF set config.
	<b>dynamic</b>	Displays information about dynamic subscriptions created using the <establish-subscription> RPC.
	<b>brief</b>	(Optional) Displays a brief summary of the subscription information.
	<b>detail</b>	(Optional) Displays the subscription information in detail.

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

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

**Usage Guidelines** Use the **show telemetry ietf subscription** command or the <get> RPC to retrieve the list of current subscription details on a device.

## Example

The following is sample output from the **show telemetry ietf subscription *subscription-ID*detail** command:

```
Device# 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 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 table below lists the significant fields shown in the display.

**Table 8: 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 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 is always be empty.

Field	Description
ID	Subscription ID.

# statistics collection-interval

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.

**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 telemetry stream for the subscription, use the **stream** command in telemetry-subscription configuration mode. To disable the configuration, use the **no** form of this command.

```
stream yang-push
no stream yang-push
```

## Syntax Description

**yang-push** Configures a yang-push stream.

## Command Modes

Telemetry-subscription configuration (config)

## Command History

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

## 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-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 telemetry stream for the subscription:

```
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# stream yang-push
```

# switch (OpenFlow)

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**

## Syntax Description

<b>1</b>	Configures the OpenFlow logical switch ID.
<b>pipeline 1</b>	Configures the OpenFlow pipeline ID.

## Command Default

The OpenFlow logical switch is not configured.

## Command Modes

OpenFlow configuration (config-openflow)

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

## Usage Guidelines

### 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)#
```

## Related Commands

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

# switch pipeline

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	This command was introduced.

**Usage Guidelines** Can we explain what a logical switch and pipeline are?  
 When you configure the command, the configuration mode changes to OpenFlow switch configuration mode.

### 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>	OpenFlow Plugin configuration and enter OpenFlow configuration mode.

# 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
```



# tls trustpoint

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.

## Usage Guidelines

### 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 update policy for subscription, use the **update-policy** command in telemetry-subscription configuration mode. To disable the configuration, use the **no** form of this command.

```
update-policy {on-change|periodic period}
no update-policy {on-change|periodic period}
```

## Syntax Description

**on-change** Enables on-change updates.

**periodic** *period* Enable on-change updates. Valid values are from 100 to 4294967295.

## Command Modes

Telemetry-subscription configuration (config)

## Command History

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

## Usage Guidelines

### Example

The following example shows how to configure a periodic update policy for a subscription:

```
Device(config)# telemetry ietf subscription 101
Device(config-mdt-subs)# update-policy periodic 6000
```