System Management Command Reference for Cisco NCS 6000 Series Routers

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Preface

This guide describes the System Management commands. This chapter contains details on the changes made to this document.

- Changes to This Document, on page iii
- Communications, Services, and Additional Information, on page iii

Changes to This Document

This table lists the changes made to this document since it was first released.

Table 1: Changes to This Document

Date	Change Summary
September 2013	Initial release of this document.
August 2014	Republished with documentation updates for Release 5.2.1 features.
November 2016	Republished with documentation updates for Release 6.1.2 features.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

Bulk Content Downloader (BCDL) Commands

This module describes the **show** commands that you can use to see the status of the Bulk Content Downloader (BCDL) process. The BCDL provides the Cisco IOS XR software with high-performance downloading capabilities. This capability is used by the following internal applications:

- IPv4 and IPv6 unicast routing protocols—To provide the ability to download forwarding information from the router Global Routing Information Base (GRIB) to the line cards.
- IPv4 and IPv6 multicast routing protocols—To download the Multicast Routing Information Base (MRIB) entries to consumers managing the Multicast Forwarding Information Base (MFIB) on the various line cards.
- MPLS—To download the Label Forwarding Information Base (LFIB) entries to the line card.
- Fabric Management—To update memberships for individual fabric group IDs (FGIDs) to selected portions of the fabric hardware.
- CDS—Context Distribution Service.

There is no configuration necessary for the BCDL.

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- show bcdl queues, on page 6
- show bcdl tables, on page 7
- show bcdl trace, on page 9

show bcdl

To display Bulk Content Downloader (BCDL) information, use the **show bcdl** command in

XR EXEC

mode.

show bcdl [*group_name*]

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output from the **show bcdl** command:

Table 2: show bcdl Field Descriptions

Field	Description
group	Type of download and the Group Services Protocol (GSP) group name.
gid	Heavyweight group (HWG) in the GSP. This is the group that a consumer initially joins. It is used by the BCDL agent to send control updates.
sg count	Number of subgroups for this particular download type.
agent jid	Job identifier of the BCDL agent. The JID is numerical identifier for a particular process and remains the same across process restarts.
node	Node, expressed in the *rack/slot* notation, in which the agent is running.
pulse	Pulse code used by the producer to pulse the BCDL agent.

Field	Description
new mbr	Number of new consumers that have not yet been assigned a subgroup.
sg	Subgroups number.
lwg	Lightweight group in GSP. This is a type of child group of the HWG. The BCDL agent tells the consumers to join this group to receive data.
fd	The connection handle between the producer and the BCDL agent.
csmr	Number of consumers.
hdlr-act	Specifies if there is a download in progress.
dnld-act	Indicates whether the convergence flag has been sent or not.
susp	Indicates whether the download is suspended due to the queue filling up.
wait-lck	If nonzero, some thread is waiting for other thread to take control of this subgroup.
seq	Sequence number of the last message sent on this subgroup.
pulse-tot	Total number of pulses sent by the producer to the BCDL agent.
pulse-out	Total number of outstanding pulses that have not yet been processed by the BCDL agent.

show bcdl consumers

To display Bulk Content Downloader (BCDL) consumer information, use the **show bcdl consumers** command in

XR EXEC

mode.

show bcdl consumers [*group_name*]

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output using the **show bcdl consumers** command:

This table describes the significant fields shown in the display that are not described in Table 2: show bcdl Field Descriptions, on page 2.

Table 3: show bcdl consumers Field Descriptions

Field	Description
PID	Process identifier.
node	Consumer node, expressed in the *rack/slot* notation.
asg	Subgroup to which the BCDL agent thinks this consumer belongs.
csg	Subgroup to which the consumer thinks it belongs.
messages	Number of messages processed by this particular consumer.

Field	Description
bytes	Bytes processed by this particular consumer.
errors	Errors encountered by the consumer. This field indicates the number of times the connection was reset.
name	Name of the consumer process.

show bcdl queues

To display the Bulk Content Downloader (BCDL) queue information, use the **show bcdl queues** command in

XR EXEC

mode.

show bcdl queues [*group_name*]

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output from the **show bcdl queues** command:

Table 2: show bcdl Field Descriptions, on page 2 and Table 3: show bcdl consumers Field Descriptions, on page 4 describe the significant fields shown in the display.

show bcdl tables

To display Bulk Content Downloader (BCDL) table information, use the **show bcdl tables** command in

XR EXEC

mode.

show bcdl tables [*group_name*]

Syntax Description

group_name	Displays information for a specific BCDL group.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output using the **show bcdl tables** command:

The significant fields shown in the display that are not described in Table 2: show bcdl Field Descriptions, on page 2 or Table 3: show bcdl consumers Field Descriptions, on page 4 are described in this table.

Table 4: show bcdl tables Field Descriptions

Field	Description
sgs	Number of subgroups.
table_cnt	Number of tables in this subgroup.
sg	Specific subgroup for which information is provided.
has 1 tables	Number of tables in this subgroup.
messages	Messages sent that are not associated with a particular table ID.

Field	Description
bytes	Bytes sent that are not associated with a particular table ID.
table	Specific table ID for which information is provided.
members	Number of consumers associated with this table.
dnld act	Indicates whether or not the convergence flag has been sent.
messages	Number of messages sent for a particular table.
bytes	Number of bytes sent for a particular table.
cnsmr 0: pid 419725 on node 0/RP0/CPU0	Process ID and node information for each consumer in the specified table.

show bcdl trace

To display Bulk Content Downloader (BCDL) trace information, use the **show bcdl trace** command in

XR EXEC

mode.

show bcdl trace [*group_name*] [**event**] [**timing**] [**grpsnd**] [{**wrapping** | **unique**}] [**hexdump**] [**last** *n*] [**reverse**] [**stats**] [**tailf**] [**verbose**] [{**file** *filename* **original location** *node-id* | **location** {*node-id* | **all**}}]

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.
event	(Optional) Displays event trace entries.
timing	(Optional) Displays timing trace entries.
grpsnd	(Optional) Displays group send trace entries.
wrapping	(Optional) Displays wrapping entries.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
hexdump	(Optional) Displays traces in hexadecimal format.
last *n*	(Optional) Displays the last *n* number of traces only.
reverse	(Optional) Displays the most recent traces first.
stats	(Optional) Displays execution path statistics.
tailf	(Optional) Displays new traces as they are added.
verbose	(Optional) Displays additional internal debugging information.
file *filename* **original location** *node-id*	(Optional) Specifies a filename and original location of the file to display.
location {*node-id* | **all**}	Specifies the RP node for which to display the execution path monitoring information. The *node-id* argument is expressed in the *rack/slot* notation. The **all** keyword specifies all RP nodes.

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output using the **show bcdl trace** command:

Cisco Discovery Protocol (CDP) Commands

This module describes the Cisco IOS XR software commands for monitoring the networking device and network using Cisco Discovery Protocol (CDP).

For detailed information about CDP concepts, configuration tasks, and examples, see the *Implementing CDP on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

- cdp, on page 12
- cdp advertise v1, on page 14
- cdp holdtime, on page 16
- cdp log adjacency changes, on page 18
- cdp timer, on page 19
- show cdp, on page 20
- show cdp entry, on page 22
- show cdp neighbors, on page 24
- show cdp traffic, on page 26

cdp

To enable the Cisco Discovery Protocol (CDP) globally or on an interface, use the **cdp** command in the appropriate configuration mode. To disable CDP globally or on an interface, use the **no** form of this command.

cdp
no cdp

Syntax Description

This command has no keywords or arguments.

Command Default

CDP is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, CDP is disabled globally. To enable CDP, CDP must be enabled globally and then enabled for each interface.

To enable CDP globally, use the **cdp** command in global configuration mode. To disable CDP globally, use the **no** form of this command in global configuration mode.

To enable CDP on a specific interface, use the **cdp** command in interface configuration mode. To disable CDP on a specific interface, use the **no** form of this command in interface configuration mode.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to globally enable CDP:

```
RP/0/RP0/CPU0:router(config)# cdp
```

The following example shows how to enable CDP on an interface:

```
RP/0/RP0/CPU0:router(config-if)# cdp
```

Related Topics

show cdp, on page 20

cdp advertise v1

To change the version of Cisco Discovery Protocol (CDP) that is used to communicate with neighboring devices to version 1 (CDPv1), use the **cdp advertise v1** command in the appropriate configuration mode. To remove the **cdp advertise v1** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

cdp advertise v1
no cdp advertise [**v1**]

Syntax Description

This command has no keywords or arguments.

Command Default

Version 2 is enabled.

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

CDPv2 packets are sent by default. CDP also sends and receives CDPv1 packets if the device with which CDP is interacting does not process CDPv2 packets.

CDPv2 adds device information over CDPv1. The additional information that is contained in the CDPv2 messages relates to Native VLAN, VLAN Trunking Protocol (VTP) Management Domain, Ethernet Duplex, and other features.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to set a networking device to send and receive only CDPv1 advertisements:

```
RP/0/RP0/CPU0:router(config)# cdp advertise v1
```

The following example shows how to restore the default condition (sending and receiving CDPv2 advertisements):

```
RP/0/RP0/CPU0:router(config)# no cdp advertise
```

Related Topics

cdp, on page 12
show cdp, on page 20

cdp holdtime

To specify the time for which the receiving device should hold a Cisco Discovery Protocol (CDP) packet from your networking device before discarding it, use the **cdp holdtime** command in the appropriate configuration mode. To remove the **cdp holdtime** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

cdp holdtime *seconds*
no cdp holdtime

Syntax Description

seconds	Holdtime to be sent in the CDP update packets, in seconds. Range is 10 to 255.

Command Default

seconds : 180

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

CDP packets are sent with a time-to-live value or holdtime, that is nonzero after an interface is enabled.

The CDP holdtime must be set to a higher number of seconds than the time between CDP transmissions, which is set using the **cdp time** command.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to specify that the CDP packets sent from the networking device are held by the receiving device for 60 seconds before being discarded. You might want to set the holdtime lower than the default setting of 180 seconds if information about your networking device changes often and you want the receiving devices to purge this information more quickly.

```
RP/0/RP0/CPU0:router(config)# cdp holdtime 60
```

Related Topics

cdp timer, on page 19

show cdp, on page 20

cdp log adjacency changes

To log changes to the Cisco Discovery Protocol (CDP) adjacency table, use the **cdp log adjacency changes** command in the appropriate configuration mode. To disable the logging, use the **no** form of this command.

cdp log adjacency changes
no cdp log adjacency changes

Syntax Description

This command has no keywords or arguments.

Command Default

CDP adjacency table logging is disabled.

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When CDP adjacency table logging is enabled, a syslog is generated each time a CDP neighbor is added or removed.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to enable CDP adjacency table logging:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# cdp log adjacency changes
```

Related Topics

show cdp, on page 20

cdp timer

To specify how often the software sends Cisco Discovery Protocol (CDP) updates, use the **cdp timer** command in the appropriate configuration mode. To remove the **cdp timer** configuration command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

cdp timer *seconds*
no cdp timer

Syntax Description

seconds	Frequency with which the Cisco IOS XR software sends CDP updates, in seconds. Range is 5 to 254. The default is 60.

Command Default

seconds : 60

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A lower timer setting causes CDP updates to be sent more frequently.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to set the CDP timer to 80 seconds, which is less frequent than the default setting of 60 seconds:

```
RP/0/RP0/CPU0:router(config)# cdp timer 80
```

Related Topics

cdp holdtime, on page 16
show cdp, on page 20

show cdp

To display global Cisco Discovery Protocol (CDP) information, including CDP version, timer, and holdtime information, use the **show cdp** command in

XR EXEC

mode.

show cdp

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

XR EXEC

Release	Modification
Release 5.0.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show cdp** command to display CDP version, timer, and holdtime information relative to CDP operations.

Task ID

Task ID	Operations
cdp	read

The following example shows how to use the **show cdp** command to verify the CDP global settings:

```
RP/0/RP0/CPU0:router# show cdp

Global CDP information:
        Sending CDP packets every 20 seconds
        Sending a holdtime value of 30 seconds
        Sending CDPv2 advertisements is not enabled
```

Table 5: show cdp Field Descriptions

Field	Definition
Sending CDP packets every 20 seconds	Interval between transmissions of CDP advertisements. This field is controlled by the **cdp timer** command.

Field	Definition
Sending a holdtime value of 30 seconds	Time for which the device directs the neighbor to hold a CDP advertisement before discarding it. This field is controlled by the **cdp holdtime** command.
Sending CDPv2 advertisements is not enabled	State of being enabled or disabled for the transmission of CDP version 2-type advertisements. This field is controlled by the **cdp advertise v1** command.

Related Topics

cdp advertise v1, on page 14
cdp holdtime, on page 16
cdp timer, on page 19
show cdp entry, on page 22
show cdp neighbors, on page 24
show cdp traffic, on page 26

show cdp entry

To display information about a specific neighboring device or all neighboring devices discovered using Cisco Discovery Protocol (CDP), use the **show cdp entry** command in

XR EXEC

mode.

show cdp entry {*****_entry-name_} [{**protocol** | **version**}]

Syntax Description

*****	Displays all CDP neighbors.
entry-name	Name of a neighbor about which you want information.
protocol	(Optional) Displays protocol information associated with CDP neighbor entries.
version	(Optional) Displays version information associated with CDP neighbor entries.

Command Default

This command displays information about a particular device that has been discovered by CDP.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
cdp	read, write

The following example shows sample output from the **show cdp entry** command. Information about device ID, address, platform, interface, holdtime, and version is displayed.

```
RP/0/RP0/CPU0:router# show cdp entry TBA04341195

-------------------------
Device ID: TBA04341195(sys-235)
SysName : sys-235
Entry address(es):
  IP address: 172.16.23.9
Platform: WS-C6006,  Capabilities: Trans-Bridge Switch
Interface: MgmtEth0/RP1/CPU0/0
```

```
Port ID (outgoing port): 4/18
Holdtime : 157 sec

Version :
WS-C6006 Software, Version McpSW: 7.2(2) NmpSW: 7.2(2)
Copyright (c) 1995-2002 by Cisco Systems

advertisement version: 2
VTP Management Domain: 'sys'
Native VLAN: 125
Duplex: full
```

Table 6: show cdp entry Field Descriptions

Field	Description
Device ID	ID code assigned during installation of the router.
Entry address(es)	Addresses of the platform, selected interface, and port ID.
Platform	Platform name.
Capabilities	Special functions that the platform can perform (in this case the platform is a trans-bridge switch).
Interface	Interface location expressed in *rack* / *slot* / *module* / *port* notation.
Port ID (outgoing port)	Location of the port in use by the interface.
Holdtime	Time (in seconds) for which the device directs the neighbor to hold a CDP advertisement before discarding it. This field is controlled by the **cdp holdtime** command.
Version	Software version.
advertisement version	Version number of the advertising protocol.
VTP Management Domain	VLAN Trunking Protocol (VTP) domain name of neighbor device.
Native VLAN	VLAN ID.
Duplex	Duplex setting: half or full.

Related Topics

show cdp, on page 20
show cdp neighbors, on page 24
show cdp traffic, on page 26

show cdp neighbors

To display detailed information about neighboring devices discovered using Cisco Discovery Protocol (CDP), use the **show cpd neighbors** command in

XR EXEC

mode.

show cdp neighbors [{*type* *interface-path-id* | **location** *node-id*}] [**detail**]

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
location *node-id*	(Optional) Displays detailed CDP information for the designated node. The *node-id* argument is entered in the *rack/slot* notation.
detail	(Optional) Displays detailed information about a neighbor or neighbors, including network address, enabled protocols, holdtime, and software version. The output includes information about both IPv4 and IPv6 addresses.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show cpd neighbors** command to display information about any CDP neighbors. When a location is specified in the command syntax, information about the neighbor is displayed for the specified node. Not specifying the location displays information about the neighbor for all interfaces.

Use the command with the **detail** keyword to display additional information, including IPv6 neighbors.

Task ID

Task ID	Operations
cdp	read

The following example shows sample output from the **show cpd neighbors** command:

```
RP/0/RP0/CPU0:router# show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater
Device ID Local Intrfce Holdtme Capability Platform Port ID
router1 Mg0/0/CPU0/0 177 T S WS-C2924M Fa0/12
router2 PO0/4/0/0 157 R 12008/GRP PO0/4/0/1
```

Related Topics

show cdp, on page 20
show cdp entry, on page 22
show cdp traffic, on page 26

show cdp traffic

To display information about the traffic gathered between devices using Cisco Discovery Protocol (CDP), use the **show cdp traffic** command in

XR EXEC

mode.

show cdp traffic [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays CDP information for the CDP packets sent and received on the designated node only. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

Displays CDP information aggregated across all nodes.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
cdp	read

The following example illustrates sample output from the **show cdp traffic** command:

```
RP/0/RP0/CPU0:router# show cdp traffic

CDP counters :
          Packets output: 50662, Input: 40414
          Hdr syntax: 0, Chksum error: 0, Encaps failed: 0
        No memory: 0, Invalid packet: 0, Truncated: 0
        CDP version 1 advertisements output: 0, Input: 0
        CDP version 2 advertisements output: 50662, Input: 40414
          Unrecognize Hdr version: 0, File open failed: 0
```

Table 7: show cdp traffic Field Descriptions

Field	Definition
Packets output	Number of CDP advertisements sent by the local device. Note that this value is the sum of the CDP version 1 advertisements output field and the CDP version 2 advertisements output field.
Input	Number of CDP advertisements received by the local device. Note that this value is the sum of the CDP version 1 advertisements input field and the CDP version 2 advertisements input field.
Hdr syntax	Number of CDP advertisements having bad headers that have been received by the local device.
Chksum error	Number of times the checksum (verifying) operation failed on incoming CDP advertisements.
Encaps failed	Number of times CDP failed to send advertisements on an interface because of a failure caused by the bridge port of the local device.
No memory	Number of times that the local device did not have enough memory to store the CDP advertisements in the advertisement cache table when the device was attempting to assemble advertisement packets for transmission and parse them when receiving them.
Invalid packet	Number of invalid CDP advertisements received and sent by the local device.
Truncated	Number of times truncated CDP advertisements were sent because there was not enough space in the CDP packet to hold all CDP type-length-values (TLVs).
CDP version 1 advertisements output	Number of CDP version 1 advertisements sent by the local device.
Input	Number of CDP version 1 advertisements received by the local device.
CDP version 2 advertisements output	Number of CDP version 2 advertisements sent by the local device.
Input	Number of CDP version 2 advertisements received by the local device.
Unrecognize Hdr version	Number of packets received from a CDP version that was outside the current configuration.
File open failed	Number of times that CDP failed to connect to one of the underlying services it uses.

Related Topics

show cdp, on page 20
show cdp entry, on page 22
show cdp neighbors, on page 24

Clock Commands

This module describes the commands used to set and display the internal clock settings in Cisco IOS XR software.

For more information about manually setting the router clock, see .

For more information about configuring the router to synchronize to Network Time Protocol (NTP), see the *Implementing NTP on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

- clock read-calendar, on page 30
- clock set, on page 31
- clock timezone, on page 33
- clock update-calendar, on page 37
- confdConfig cli timezone local, on page 38
- confdConfig cli utcOffset, on page 39
- confdConfig cli idleTimeout, on page 40
- confdConfig cli timestamp, on page 41
- locale country, on page 42
- locale language, on page 44
- show clock, on page 46
- show clock sync, on page 48

clock read-calendar

To manually copy the hardware clock (calendar) settings into the software clock, use the **clock read-calendar** command in XR EXEC modeSystem Admin EXEC mode.

clock read-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

Read calendar is disabled.

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

The *calendar clock* is a hardware system clock that runs continuously, even if the router is powered off or rebooted. The hardware system clock is separate from the software clock settings, which are erased when the router is power cycled or rebooted.

Use the **clock read-calendar** command to manually copy the hardware clock setting into the software clock.

Task ID

Task ID	Operations
host-services	execute

In the following example, the hardware clock settings are copied to the software clock with the **clock read-calendar** command. The **show clock** command is then entered to display the new software clock settings.

```
sysadmin-vm:0_RP0# clock read-calendar
sysadmin-vm:0_RP0# show clock
  Thu Jul  18 14:56:51.888 UTC
Thu Jul 18 14:56:52 UTC 2013
```

Related Topics

clock set, on page 31
clock update-calendar, on page 37
show clock, on page 46
update-calendar, on page 283

clock set

To change the software clock settings, use the **clock set** command in XR EXEC modeor System Admin EXEC mode.

clock set *hh*:*mm*:*ss* {*day month* | *month day*} *year*

In the System Admin EXEC mode, the syntax is:

clock settime*date-time*

Syntax Description

hh : *mm* : *ss*	Current time in hours (24-hour format), minutes, and seconds. Colons are required between values.
day	Current day (by date) in the month.
month	Current month (by name).
year	Current year (no abbreviation). Enter a valid four-digit year.

Command Default

Clock is not set.

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Generally, if the system is synchronized by a valid outside timing mechanism, such as a Network Time Protocol (NTP) clock source, or if you have a networking device with calendar capability, you need not set the software clock. Use the **clock set** command if no other time sources are available. The time specified in this command is relative to the configured time zone.

Task ID

Task ID	Operations
host-services	execute

Setting the Software Clock

This example shows how to set the software clock using the **clock set** command with the *day month* arguments first.

```
RP/0/RP0/CPU0:router# clock set 14:12:00 10 feb 2005
```

```
14:12:00.114 JST Fri Feb 10 2009
```

This example shows how to set the software clock using the **clock set** command with the *month day* arguments first.

```
RP/0/RP0/CPU0:router# clock set 14:38:00 feb 10 2005

14:38:00.069 PST Tue Feb 10 2009
```

Displaying the Clock Settings

This example shows how to display the settings of the software clock:

```
RP/0/RP0/CPU0:router# show clock

14:38:11.292 PST Tue Feb 10 2009
```

This example shows how to use th **clock set** command:

```
RP/0/RP0/CPU0:router#clock set 23:32:22 january 1 2014
Mon Mar 10 20:40:27.082 UTC
23:32:22.016 UTC Wed Jan 01 2014
RP/0/RP0/CPU0:router#


RP/0/RP0/CPU0:router#show clock
Wed Jan  1 23:43:20.884 UTC
23:43:21.896 UTC Wed Jan 01 2014
RP/0/RP0/CPU0:router#
```

Related Topics

clock timezone, on page 33
show clock, on page 46

clock timezone

To set the time zone for display, use the **clock timezone** command in System Admin Config mode or XR Config mode. To remove the time zone setting, use the **no** form of this command.

clock timezone *zone region*
no clock timezone

Syntax Description

zone	Name of the time zone to be displayed when standard time is in effect.
region	Sets the offset according to the region specified.

Command Default

UTC

Command Modes

System Admin Config mode

XR Config mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

This table lists common time zone acronyms used for the *zone* argument.

Table 8: Common Time Zone Acronyms

Acronym	Time Zone Name and UTC Offset
Europe	
GMT	Greenwich Mean Time, as UTC.
BST	British Summer Time, as UTC plus 1 hour.
IST	Irish Summer Time, as UTC plus 1 hour.
WET	Western Europe Time, as UTC.
WEST	Western Europe Summer Time, as UTC plus 1 hour.
CET	Central Europe Time, as UTC plus 1 hour.
CEST	Central Europe Summer Time, as UTC plus 2 hours.
EET	Eastern Europe Time, as UTC plus 2 hours.

Acronym	Time Zone Name and UTC Offset
EEST	Eastern Europe Summer Time, as UTC plus 3 hours.
MSK	Moscow Time, as UTC plus 3 hours.
MSD	Moscow Summer Time, as UTC plus 4 hours.
United States and Canada	
AST	Atlantic Standard Time, as UTC minus 4 hours.
ADT	Atlantic Daylight Time, as UTC minus 3 hours.
ET	Eastern Time, either as EST or EDT, depending on place and time of year.
EST	Eastern Standard Time, as UTC minus 5 hours.
EDT	Eastern Daylight Saving Time, as UTC minus 4 hours.
CT	Central Time, either as CST or CDT, depending on place and time of year.
CST	Central Standard Time, as UTC minus 6 hours.
CDT	Central Daylight Saving Time, as UTC minus 5 hours.
MT	Mountain Time, either as MST or MDT, depending on place and time of year.
MST	Mountain Standard Time, as UTC minus 7 hours.
MDT	Mountain Daylight Saving Time, as UTC minus 6 hours.
PT	Pacific Time, either as PST or PDT, depending on place and time of year.
PST	Pacific Standard Time, as UTC minus 8 hours.
PDT	Pacific Daylight Saving Time, as UTC minus 7 hours.
AKST	Alaska Standard Time, as UTC minus 9 hours.
AKDT	Alaska Standard Daylight Saving Time, as UTC minus 8 hours.
HST	Hawaiian Standard Time, as UTC minus 10 hours.
Australia	
WST	Western Standard Time, as UTC plus 8 hours.
CST	Central Standard Time, as UTC plus 9.5 hours.
EST	Eastern Standard/Summer Time, as UTC plus 10 hours (plus 11 hours during summer time).

This table lists an alternative method for referring to time zones, in which single letters are used to refer to the time zone difference from UTC. Using this method, the letter Z is used to indicate the zero meridian, equivalent to UTC, and the letter J (Juliet) is used to refer to the local time zone. Using this method, the International Date Line is between time zones M and Y.

Table 9: Single-Letter Time Zone Designators

Letter Designator	Word Designator	Difference from UTC
Y	Yankee	UTC minus 12 hours.
X	Xray	UTC minus 11 hours.
W	Whiskey	UTC minus 10 hours.
V	Victor	UTC minus 9 hours.
U	Uniform	UTC minus 8 hours.
T	Tango	UTC minus 7 hours.
S	Sierra	UTC minus 6 hours.
R	Romeo	UTC minus 5 hours.
Q	Quebec	UTC minus 4 hours.
P	Papa	UTC minus 3 hours.
O	Oscar	UTC minus 2 hours.
N	November	UTC minus 1 hour.
Z	Zulu	Same as UTC.
A	Alpha	UTC plus 1 hour.
B	Bravo	UTC plus 2 hours.
C	Charlie	UTC plus 3 hours.
D	Delta	UTC plus 4 hours.
E	Echo	UTC plus 5 hours.
F	Foxtrot	UTC plus 6 hours.
G	Golf	UTC plus 7 hours.
H	Hotel	UTC plus 8 hours.
I	India	UTC plus 9 hours.
K	Kilo	UTC plus 10 hours.
L	Lima	UTC plus 11 hours.

Letter Designator	Word Designator	Difference from UTC
M	Mike	UTC plus 12 hours.

Task ID

Task ID	Operations
host-services	read, write

This example shows how to set the time zone to IST Asia/Calcutta:

```
sysadmin-vm:0_RP0# config
sysadmin-vm:0_RP0(config)# clock timezone IST Asia/Calcutta
```

Related Topics

clock set, on page 31
show clock, on page 46

clock update-calendar

To copy the software clock settings to the hardware clock (calendar), use the **clock update-calendar** command in XR EXEC mode System Admin EXEC mode.

clock update-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The hardware clock (calendar) runs continuously, even if the router is powered off or rebooted. If the software clock and calendar are not synchronized and the software clock is more accurate, use this command to update the hardware calendar clock to the correct date and time.

Task ID

Task ID	Operations
host-services	execute

The following example shows how to copy the current time from the software clock to the hardware clock:

```
RP/0/RP0/CPU0:router# clock update-calendar
```

Related Topics

clock read-calendar, on page 30

confdConfig cli timezone local

To specify the timezone that must be used when displaying the time in the CLI, use the **confdConfig cli timezone local** command in System Admin Config mode.

confdConfig cli timezone local

Syntax Description

timezone	Specifies the timezone that must be used when displaying the time in the CLI. If **local** is specified then the timezone that is configured on the device is used.

Command Default

The default value is **local**.

Command Modes

System Admin Config

Command History

Release	Modification
Release 6.3.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to configure the timezone:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli timezone local
Thu May  23  23:19:47.567 UTC+00:00
```

confdConfig cli utcOffset

To specify the UTC offset measured in minutes, use the **confdConfig cli utcOffset** command in System Admin Config mode.

confdConfig cli utcOffset *integer*

Syntax Description

integer	Specifies the UTC offset measured in minutes.

Command Default

The default value is **0**.

Command Modes

System Admin Config

Command History

Release	Modification
Release 6.3.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to configure the UTC offset:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli utcOffset 0
Thu May  23  23:19:47.567 UTC+00:00
```

confdConfig cli idleTimeout

To specify the maximum idle time before terminating a CLI session, use the **confdConfig cli idleTimeout** command in System Admin Config mode.

confdConfig cli idleTimeout *time*

Syntax Description

time	Specifies the idle timeout value. It must be in this format: (nYnMnDnHnMnS).

Command Default

The default value is **PT10M**, which is 10 minutes. **PT0M** means no timeout.

Command Modes

System Admin Config

Command History

Release	Modification
Release 6.3.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to configure the idle timeout of 25 minutes:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli idleTimeout 25m
Thu May  23  23:19:47.567 UTC+00:00
```

confdConfig cli timestamp

To enable or disable the display of timestamps, use the **confdConfig cli timestamp** command in System Admin Config mode.

confdConfig cli timestamp {*enabled* | *disabled*}

Syntax Description

enabled	Enables the display of timestamps.
disabled	Disables the display of timestamps.

Command Default

The default value is **enabled**.

Command Modes

System Admin Config

Command History

Release	Modification
Release 6.3.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to enable the display of timestamp:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli timestamp enabled
Thu May  23  23:19:47.567 UTC+00:00
```

locale country

To set the default country of use, use the **locale country** command in

XR Config

mode. To remove the country setting, use the **no** form of this command.

locale country *country*
no locale country

Syntax Description

country	Country, where *country* is a two-character country code. Case is not important.

Command Default

No default behavior or values

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note This command is not fully supported at this time.

To display a complete listing of the available country codes, use the online help (**?**) function:

```
RP/0/RP0/CPU0:router(config)# locale country ?

    AD    Andorra
    AE    United Arab Emirates
    AF    Afghanistan
    AG    Antigua and Barbuda
    AI    Anguilla
    AL    Albania
    AM    Armenia
    AN    Netherlands Antilles
    AO    Angola
    AQ    Antarctica
    AR    Argentina
    AS    American Samoa
    AT    Austria
    AU    Australia
    AW    Aruba
    AZ    Azerbaijan
    BA    Bosnia and Herzegovina
    BB    Barbados
```

```
  BD    Bangladesh
  BE    Belgium
--More--
```

Task ID

Task ID	Operations
host-services	read, write

The following example shows how to set the country of use to Australia:

```
RP/0/RP0/CPU0:router(config)# locale country au
```

Related Topics

locale language, on page 44

locale language

To set the default language of use, use the **locale language** command in

XR Config

mode. To remove the language setting, use the **no** form of this command.

locale language *language*
no locale language

Syntax Description

language	Two-character code that specifies the language. Case is not important.

Command Default

No default behavior or values

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note This command is not fully supported at this time.

To display a complete listing of the available language codes, use the online help (?) function:

```
RP/0/RP0/CPU0:router(config)# locale language ?

aa    Afar
ab    Abkhazian
af    Afrikaans
am    Amharic
ar    Arabic
as    Assamese
ay    Aymara
  --More--
```

Task ID

Task ID	Operations
host-services	read, write

The following example shows how to set the language of use to English:

```
RP/0/RP0/CPU0:router(config)# locale language en
```

Related Topics

locale country, on page 42

show clock

To display the system clock, use the **show clock** command in

XR EXEC

mode.

show clock [**detail**]

Syntax Description

detail	(Optional) Indicates the time zone, time source, and current summer time setting (if any).

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The system clock keeps an "authoritative" flag that indicates whether the time is authoritative (believed to be accurate). If the system clock has been set by a timing source, such as system calendar or Network Time Protocol (NTP), the flag is set. If the time is not authoritative, it is used only for display. Until the clock is authoritative and the "authoritative" flag is set, the flag prevents peers from synchronizing to the clock when the peers have invalid times.

The leading symbols that precede the **show clock** command display are shown in this table

Table 10: show clock Display Leading Symbol Descriptions

Symbol	Description
*	Time is not authoritative.
(blank)	Time is authoritative.
.	Time is authoritative, but NTP is not synchronized.

Task ID

Task ID	Operations
basic-services	read

The following sample output shows the current clock settings:

```
RP/0/RP0/CPU0:router# show clock
```

```
16:18:28.927 PST Tue Feb 10 2009
```

The following sample output shows the current clock detail, including the time zone and time source:

```
RP/0/RP0/CPU0:router# show clock detail

16:18:07.164 PST Tue Feb 10 2009
Timezone: PST8PST Timesource: User configured
```

Related Topics

clock set, on page 31

show clock sync

To show the time difference between the clocks on route processors (RPs) and other line cards (LCs), use the **show clock sync** command in EXEC command mode.

show clock sync

Command Default

Displays the clock time for each RP or LC in a secure domain router (SDR), relative to the clock time on the RP where the command is entered.

Command Modes

EXEC

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

In a router running Cisco IOS XR software the time clock in the primary RP is synchronized with the other RPs, DRPs, and LCs in the system. This synchronization ensures that the standby RP has an accurate time setting if it assumes the primary role and that the events in logs between different RPs and LCs can be easily correlated during debugging.

The **show clock sync** command verifies that the cards in the router are synchronized with the primary RP. When this command is run, the primary RP queries the clocks on each card in the system and displays the time difference between each card and the primary RP. If the time setting on the card is different from the time on the primary RP, the display shows if the clock on the card is being adjusted to synchronize with the primary RP.

Note The **show clock sync** command shows the relative time difference between the RP where it is run and the cards in that SDR. If the command is run on the primary RP for the owner SDR, then the results show the relative time settings for the cards assigned to the owner SDR. If the command is run on the DSDRSC for a non-owner SDR, then the results are for the cards in that SDR. The **show clock sync** command can also be run on the standby RP, but the times displayed are relative to that RP.

Task ID

Task ID	Operations
ip-services	read
basic-services	read

The following example illustrates sample output from the **show clock sync** command:

```
RP/0/0/CPU0:router# show clock sync

                RoundTrip    Time
Slot   Card       Delay     Offset    Local Time
-------------------------------------------------------------------------
  0  RP   Card      0 ms    0.000 s   16:00:05.798 UTC Sun Apr 09 2006
  1  RP   Card      1 ms    0.001+s  +16:00:05.798 UTC Sun Apr 09 2006
  2  Line Card      2 ms    0.000 s  -16:00:05.798 UTC Sun Apr 09 2006
  3  Line Card     15 ms    0.004+s  -16:00:05.802 UTC Sun Apr 09 2006
  4  Line Card      1 ms    0.001+s  -16:00:05.798 UTC Sun Apr 09 2006
  5  Line Card      2 ms    0.002+s  +16:00:05.799 UTC Sun Apr 09 2006
```

Table 11: show clock sync Field Descriptions

Field	Description
Slot	Physical slot number of the card.
Card	Type of card on the specified slot.
RoundTrip Delay	Time (in milliseconds) required for the test message to travel between the RP and LC and back.
Time Offset	Time difference (in seconds) between cards shown in the display.
Local Time	Displays the system clock setting. This is the same as the output displayed with the **show clock** command. The positive (+) or negative (-) sign is added if the card is being adjusted to run faster or slower.

Configuration Management Commands

This module describes the Cisco IOS XR commands used to manage your basic configuration.

For detailed information about configuration management concepts, tasks, and examples, see .

- abort, on page 53
- admin, on page 54
- activate advanced, on page 55
- alias, on page 56
- apply-group, on page 59
- apply-group-remove, on page 61
- apply-template, on page 62
- clear comment, on page 63
- clear configuration commits, on page 64
- clear configuration inconsistency, on page 66
- configure, on page 68
- description (interface), on page 70
- do, on page 71
- end, on page 73
- end-group, on page 75
- end-template, on page 76
- exclude-group, on page 77
- exit, on page 78
- group (configuration), on page 80
- hostname, on page 85
- ipv6-enable, on page 86
- load commit changes, on page 87
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- pwd (config), on page 93
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- root, on page 97
- save configuration, on page 99
- save configuration changes, on page 100
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- set default-afi, on page 107
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- show configuration changes, on page 118
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- show configuration failed (config), on page 123
- show configuration failed remove, on page 125
- show configuration history, on page 127
- show configuration inconsistency replica, on page 130
- show configuration persistent, on page 131
- show configuration running, on page 133
- show configuration sessions, on page 134
- show default-afi-safi-vrf, on page 136
- snmp-server script, on page 137
- show running-config, on page 138
- service cli commit-optimized enable, on page 141
- template, on page 142

abort

To terminate a configuration session and discard all uncommitted changes without system confirmations, use the **abort** command in any configuration mode.

abort

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **abort** command to terminate a configuration session and return to EXEC mode from any configuration mode. This command discards all uncommitted configuration changes. You are prompted to commit the changes.

Task ID

Task ID	Operations
Task ID for the feature or mode impacted by the command	Operation for the feature or mode impacted by the command

The following example shows how to use the **abort** command to discard all changes made during a configuration session:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/1/1/1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# abort
RP/0/RP0/CPU0:router#
```

Related Topics

end, on page 73
exit, on page 78

admin

To enter System Admin EXEC mode, use the **admin** command in XR EXEC mode.

admin

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **admin** command to enter System Admin EXEC mode mode. Administration commands are used to configure secure domain routers (SDRs) and to execute various administration plane commands.

Note Administration commands can be run only by entering administration mode and not by prefixing the **admin** command with the keyword in XR EXEC mode mode.

Task ID

Task ID	Operations
admin	read, write, execute

The following example shows how to enter System Admin EXEC mode mode:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)#
```

To use administration configuration mode, use the **configure** command in System Admin EXEC mode mode:

```
root connected from 127.0.0.1 using console on xr-vm_node0_RP1_CPU0
sysadmin-vm:0_RP0#
sysadmin-vm:0_RP0# conf t
Mon Mar  10 12:08:25.419 UTC-07:00
Entering configuration mode terminal
```

Related Topics

configure, on page 68

activate advanced

To enable access to advanced system admin commands and configurations, use the **activate advanced** command in System Admin EXEC mode mode. These commands and configurations allow access to the advanced functionalities of the system admin services.

activate advanced

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.2.1	This command was introduced.

Usage Guidelines

This command should not be used unless specifically requested by Cisco TAC or another Cisco support representative.

Task ID

Task ID	Operation
admin	read, write, execute

This example shows sample output from the **activate advanced** command:

```
# activate advanced
Advanced commands must be used carefully. Continue? [yes,NO] yes
Tue Aug  29 20:05:16.635 UTC
```

alias

To create a command alias, use the **alias** command in XR Config mode. To delete an alias, use the **no** form of this command.

alias *alias-name line*
no alias *alias-name*

Syntax Description

alias-name	Name of the command alias. Alias names can be a single word or multiple words joined by a hyphen (-) or an underscore (_).
line	Original command syntax. Valid abbreviations of the original command syntax can be entered for the *line* argument.

Command Default

No command aliases are configured.

Command Modes

XR Config mode

System Admin EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Cisco IOS XR software supports generic alias definitions for various entities. Any physical or logical entity can have an alias as a reference. For example, an alias can refer to a command, a partial command, a group of commands, a location, or an IP address.

An alias must first be defined. The alias can then be used in command lines in place of the defined entity.

Following is a list of properties for an alias:

- An alias can be used anywhere and in any mode.
- An alias can have zero, one, or many parameters.
- An alias can refer to those parameters with the $ sign.
- If an alias refers to more than one command, the commands must be separated by a semicolon (;).
- The size of the **alias** command is limited to 1024 characters.

The alias command can be used anywhere. If the content referenced by the alias is invalid or inappropriate in that context or mode, the system issues a warning message containing the substituted content.

An alias name should not be a subset of the keywords that it represents as alias. Substitution is done only when the entered input match fails completely. For instance, the attempt to define an alias with “config? as the alias name fails, as shown in the following example:

```
RP/0/RP0/CPU0:router(config)# alias config set_host hostname router
RP/0/RP0/CPU0:router(config)# show configuration
```

```
alias set_host hostname router
```

Use the **show aliases** command to display all command aliases or the command aliases in a specified mode.

Task ID

Task ID	Operations
logging	read, write

The following example shows how to create an alias named ipbr for the **show ipv4 interface brief** command, commit the configuration, enter XR EXEC mode and then enter the configured alias:

```
RP/0/RP0/CPU0:router#show ip int brief
Thu Jan  2 00:56:58.531 UTC

Interface                      IP-Address      Status                Protocol
MgmtEth0/RP0/CPU0/0            unassigned      Shutdown              Down
TenGigE0/1/0/0                 unassigned      Shutdown              Down
```

The following example shows how to run this command in the System Admin config mode:

```
sysadmin-vm:0_RP0(config)# alias host show run
sysadmin-vm:0_RP0(config)# commit
Mon Mar  10 21:59:17.753 UTC
Commit complete.
sysadmin-vm:0_RP0(config)# end
Mon Mar  10 21:59:20.342 UTC
sysadmin-vm:0_RP0# host
sysadmin-vm:0_RP0# show run
Mon Mar  10 21:59:22.574 UTC
fpd auto-upgrade disable
dump Bao
 0
  location 0/1
  !
 !
 1
  location 0/1
  !
 !
!
aaa authentication users user root
 uid        9000
--More---
sysadmin-vm:0_RP0#
sysadmin-vm:0_RP0# show run | inc alias
Mon Mar  10 22:08:03.809 UTC
alias host show run
```

The following example shows the use of a parameter name in an alias definition:

```
RP/0/RP0/CPU0:router(config)# alias shint (intname) show interface $intname
```

The following example shows an alias defined with one parameter and two commands:

```
RP/0/RP0/CPU0:router(config)# alias shint_both (intname) show interface $intname;show run
```

```
interface $intname
```

Related Topics

show aliases, on page 111

apply-group

To cause the configuration commands contained in a group or multiple groups to be inherited by the router configuration within which it is applied, use the **apply-group** command in the appropriate configuration mode. To remove a group configuration, use the **no** form of this command.

apply-group *group-name* [*group-name*]
no apply-group

Syntax Description

group-name	Name of the configuration group to apply. The group must be previously defined. Up to eight group names can be specified at one time.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configuration statements in configuration groups come into effect only when the configuration groups are applied in the system configuration, and the configuration statements have the correct context and inheritance priority in the mode in which the configuration groups are applied. The maximum number of configuration groups that can be specified in a single **apply-group** command is eight.

To change the composition of an **apply-group** command, you must specify all desired groups. For example, if you used the command `apply-group g10 g20 g30`, and now you want to add the group g15, use the command `apply-group g10 g15 g20 g30`. If you now want to delete group g20, use the command `apply-group g10 g15 g30`. If you use the **no apply-group** command, all groups are removed from the configuration.

Note From the Release 6.3.1 onwards, you are able to enter the Flexible CLI config group definition, **apply-group** and **exclude-group** command in any order as long as the entire commit has all the group definitions needed.

Note Use multi-line configuration style to configure Flexible CLI configuration groups by entering each configuration mode in a separate line, one configuration per line. This is important so that the configuration properties are fully inherited and for better readability during troubleshooting.

Task ID

Task ID	Operation
config-services	read, write

This example applies a configuration group to a specific OSPF instance:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router ospf 0
RP/0/RP0/CPU0:router(config-ospf)# apply-group G-OSPF-B
```

Related Topics

group (configuration), on page 80

apply-group-remove

To remove one or more configuration groups from an existing apply-group, use the **apply-group-remove** command in the same configuration mode in which the group was applied.

apply-group-remove *group-nameexisting-group-name*

Syntax Description

group-name	Name of the group you want to remove from an existing group. Up to eight group names can be specified in this command at a time.
existing-group-name	Name of the applied (pre-defined) group from which a group will be removed.

Command Default

None

Command Modes

Global configuration or any configuration mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

Consider, you have configured four groups, g10 g20 g30 g40 using the **apply-group** command. To remove g20, you can use the **apply-group-remove** command to edit the **apply-group** command configuration.

Note This command is not a configuration command and will not be seen in **show configuration** or **show run** commands.

Note This command has to be executed in the same configuration mode as the **apply-group** command used to configure the groups.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to remove the group, G-OSPF-B, using this command:

```
RP/0/RP0/CPU0:router configure
RP/0/RP0/CPU0:router (config)# router ospf 0
RP/0/RP0/CPU0:router (config-ospf)# apply-group-remove G-OSPF-B
```

apply-template

To apply a template to the target configuration, use the **apply-template** command in XR Config mode.

apply-template *template-name* [**(***param-list***)**]

Syntax Description

template-name	Name of the template to be applied to the running configuration. Use the **template** command to define a template.
param-list	(Optional) Up to five template parameters.

Command Default

No templates are applied to the target configuration.

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **apply-template** command to apply a template to the target configuration. Templates allow you to create a template name that represents a group of configuration commands.

Use the **template** command to define a template. Use the **end-template** command to exit template configuration mode and return to global configuration mode. Use the **show-running** command with the optional **template** *template-name* keyword and argument to display the contents of a template.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to define a template and then apply the template to the target configuration:

```
RP/0/RP0/CPU0:router(config)# template hostname-template
RP/0/RP0/CPU0:router(config-TPL)# hostname router1
RP/0/RP0/CPU0:router(config-TPL)# end-template
RP/0/RP0/CPU0:router(config)# apply-template hostname-template
```

Related Topics

end-template, on page 76
show running-config, on page 138
template, on page 142

clear comment

To discard a comment associated with a configuration, use the **clear comment** command in XR Config mode.

clear comment

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

The **clear comment** command clears any comments that were added for a specific configuration in the configuration file. After you enter the **clear comment** command, enter the configuration for which you want to delete the comment on a separate line.

To enter configuration comments, enter ! followed by the comment. The comment you enter is associated with the next configuration entered. For example:

```
RP/0/RP0/CPU0:router#!router1 is located in xxx
RP/0/RP0/CPU0:router# hostname router1
RP/0/RP0/CPU0:router# commit
```

The comment is displayed in the output of the **show running-config** command:

```
RP/0/RP0/CPU0:router# show running-config
...
!router1 is located in xxx
hostname router1
...
```

Task ID

Task ID	Operations
Task ID for the feature or configuration mode impacted by the command	Operation for the feature or configuration mode impacted by the command

The following example shows how to discard the comment associated with the configuration ipv4 address 10.0.0.1 255.0.0.0.

```
RP/0/RP0/CPU0:router(config-if)# clear comment
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
```

clear configuration commits

To delete old commit IDs from the commit database to free up disk space, use the **clear configuration commits** command in System Admin EXEC modeor XR EXEC mode.

clear configuration commits {**diskspace** *kilobytes* | **oldest** *number-of-commits*}

Syntax Description

diskspace *kilobytes*	Deletes as many commit IDs (beginning with the oldest available commit ID) from the commit database as required to free the number of kilobytes (KB) specified for the *kilobytes* argument. The range for the number of kilobytes of disk space to free is 1 to 4194304. **Note** The amount of disk space freed may vary depending on the size and number of commits present in the commit database.
oldest *number-of-commits*	Deletes the number of commit IDs specified for the *number-of-commits* argument. **Note** Use the online help (**?**) function to display the range of commit IDs available for deletion.

Command Default

None

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear configuration commits** command to delete the number of commit IDs available for rollback operations. The most recent 100 commits are retained by the system. As new commit IDs are added, the oldest commit IDs are discarded and are no longer available for rollback operations.

Note The **clear configuration commits** command deletes commits from the commit database only. The running configuration, thus, is not changed.

Note When a commit ID is deleted from the commit database, it is no longer available for rollback and can no longer be used to display commit changes (with the **show configuration rollback changes** command).

Use the **rollback configuration** command to roll back the current running configuration to a previous configuration. Use the **show configuration rollback changes** command to display a list of the commit IDs available for rollback operations or to display the changes that would be made by the **rollback configuration** command.

Task ID

Task ID	Operations
config-services	execute

The following example shows how to delete the oldest 16 commit IDs to free up disk space. After entering this command, you will be prompted to confirm the deletion.

```
RP/0/RP0/CPU0:router# clear configuration commits oldest 16

Deleting 16 rollback points '1000000021' to '1000000036'
256 KB of disk space will be freed. Continue with deletion?[confirm] y
```

Related Topics

rollback configuration, on page 94

clear configuration inconsistency

To clear an inconsistency alarm for an SDR configuration use the **clear configuration inconsistency** command in System Admin EXEC mode or XR EXEC mode.

clear configuration inconsistency

Syntax Description

This command has no keywords or arguments.

Command Default

XR EXEC: Clears the inconsistency alarms for an SDR configuration.

Command Modes

System Admin EXEC mode

XR EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An inconsistency alarm is set when there is a failure to restore the configuration; this can occur during router startup, or when a line card or route processor (RP) card is inserted or removed.

If an inconsistency alarm is set, a message similar to the following example is displayed:

```
RP/0/0/CPU0:May 26 11:58:40.662 : cfgmgr-rp[130]: %MGBL-CONFIGCLI-3
   BATCH_CONFIG_FAIL : 28 config(s) failed during startup. To view
   failed config(s) use the command - "show configuration failed startup"

RP/0/0/CPU0:May 26 11:58:41.731 : cfgmgr-rp[130]:
   %MGBL-CONFIG-3-ADMIN_INCONSISTENCY_ALARM : Admin plane configuration
   inconsistency alarm has been raised. Configuration commits will be
   blocked until an ADMIN plane 'clear configuration inconsistency' command
   has been run to synchronize persisted admin plane configuration with
   running admin configuration.
```

When the inconsistency alarm is set, all configuration commit operations fail until the alarm is cleared using the **clear configuration inconsistency** command. This command clears the alarm and removes the failed configuration.

For example, the following configuration commit fails to finish due to an existing inconsistency alarm:

```
RP/0/RP0/CPU0:router# configure

ADMIN plane running configuration is inconsistent with persistent
  configuration.
No configuration commits will be allowed until an admin plane
'clear configuration inconsistency' command is performed.
RP/0/RP0/CPU0:router(config)# hostname router2
RP/0/RP0/CPU0:router(config)#commit

ADMIN plane running configuration is inconsistent with persistent
  configuration.
```

```
No configuration commits will be allowed until an admin plane
'clear configuration inconsistency' command is performed.
```

Enter the **clear configuration inconsistency** command to clear the alarm and allow commit operations to continue.

Note To reapply the failed configuration, you must reapply and recommit the configuration. Use the **load configuration failed** command with the **startup** keyword to populate the target configuration with the contents of the previous failed configuration from the startup configuration.

Use the **show configuration history** command with the **alarm** keyword to view the inconsistency alarm set and alarm clear events in the configuration history log.

Command Modes

To clear the inconsistency alarms for the router, enter the **clear configuration inconsistency** command in EXEC mode.

Task ID

Task ID	Operations
config-services	execute

The following example shows how to clear the inconsistency alarms for an SDR configuration. The command is entered in XR EXEC mode and impacts only that SDR.

```
RP/0/RP0/CPU0:router# clear configuration inconsistency

Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
RP/0/RP0/CPU0:Nov 12 08:41:18.476 : cfgmgr_cfs_check[69083]: ISSU: Starting sysdb bulk start
 session
Syncing commit database with running configuration...OK
```

In the following example, a history of the inconsistency alarms set and cleared for the configuration are displayed using the **show configuration history** command with the **alarm** keyword:

```
RP/0/RP0/CPU0:router# show configuration history alarm

  Sno.  Event      Info                          Time Stamp
  ~~~~  ~~~~~      ~~~~                          ~~~~~~~~~~
  1     alarm      inconsistency alarm raised    Thu Jun 22 15:23:15 2009
  2     alarm      inconsistency alarm cleared   Thu Jun 22 15:42:30 2009
  3     alarm      inconsistency alarm raised    Sun Jul  9 13:39:57 2009
  4     alarm      inconsistency alarm cleared   Sun Jul  9 14:15:48 2009
  5     alarm      inconsistency alarm raised    Sat Jul 15 18:18:26 2009
  6     alarm      inconsistency alarm cleared   Sat Jul 15 19:21:03 2009
```

Related Topics

load configuration failed, on page 88
show configuration history, on page 127

configure

To enter global configuration mode or administration configuration mode, use the **configure** command inXR EXEC mode or System Admin EXEC mode.

configure [{**exclusive** | **terminal**}]

Syntax Description

exclusive	(Optional) Locks the router configuration. The system configuration can be made only from the login terminal.
terminal	(Optional) Configures the system from the login terminal. This is the default.

Command Default

If the **configure** command is entered without a keyword, the system is configured from the login terminal.

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configuration modes are used to enter changes to a target configuration session and commit those changes to the running configuration. A router running Cisco IOS XR software contains multiple configurations:

- The configuration for a specific secure domain router (SDR). Each SDR has its own configuration that is modified when a user logs into an SDR and enters global configuration mode . This mode is used to configure -SDR specific features such as routing protocols.
- The administration configuration for system-wide resources and settings. Some features, such as creating SDRs, can be configured only in administration configuration mode.

XR Config mode

Use the **configure** command in XR EXEC mode to enter XR Config mode and create a new target configuration for an SDR. From global configuration mode, you can enter any configuration mode. Configuration changes entered in global configuration mode impact the SDR to which the user is currently logged in.

System Admin Config mode

Use the **configure** command in System Admin EXEC mode to enter System Admin Config mode and create a new target configuration. From System Admin EXEC mode , you can enter any configuration mode. Configuration changes entered in System Admin EXEC mode can impact resources for the entire router. See the command reference documentation for a specific command to determine the impact of commands entered in System Admin EXEC mode.

Router Prompt

After you enter the **configure** command, the system appends "(config)" to the router prompt, indicating that the router is in a configuration mode. For example:

- The following prompt indicates that you are in global configuration mode for an SDR:

```
RP/0/RP0/CPU0:router(config)#
```

- The following prompt indicates that you are in administration configuration mode:

```
RP/0/RP0/CPU0:router(admin-config)#
```

Locking a Configuration Session

To lock the configuration so that no other user can commit changes to the running configuration during your configuration session, issue the **configure** command with the **exclusive** keyword.

Committing Changes and Returning to XR EXEC mode or System Admin EXEC mode

Changes to the target configuration remain inactive until the **commit** command is entered. To leave global configuration or administration configuration mode and return to the XR EXEC mode or System Admin EXEC mode prompt, issue the **end** or **exit** command; you are prompted to commit any uncommitted changes.

To leave configuration mode and return directly to XR EXEC mode or System Admin EXEC mode without being prompted to commit changes and without saving changes to the target configuration, enter the **abort** command in any configuration mode.

The following example shows how to enter global configuration mode from XR EXEC mode and then enter interface configuration mode to configure an IPv4 address , the **configure** command commits the configuration, and the **end** command terminates the configuration session and return the router to XR EXEC mode.

```
sysadmin-vm:0_RP0# config
Mon Mar  10 12:08:25.419 UTC-07:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)#
```

Related Topics

abort, on page 53
end, on page 73
exit, on page 78
show configuration (config), on page 116
show running-config, on page 138

description (interface)

To add a description to an interface configuration, use the **description** command in interface configuration mode. To remove the description, use the **no** form of this command.

description *line*
no description

Syntax Description

line	Comment or a description applied to the interface. The maximum number of characters is 1022.

Command Default

No description is configured.

Command Modes

Interface configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **description** command to add a description to an interface configuration. The maximum number of characters is 1022.

Task ID

Task ID	Operations
interface	read, write

The following example shows how to add a description to an interface configuration. In this example, the **description** command names a Management Ethernet interface.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface mgmteth 0/

1/CPU0/0
RP/0/RP0/CPU0:router(config-if)# description Management Ethernet Interface
```

Related Topics

show interfaces

do

To execute an XR EXEC or Sysadmin mode command from a configuration mode, use the **do** command in any configuration mode.

do *exec-command*

Syntax Description

exec-command	XR EXEC mode command to be executed.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To display the various XR EXEC mode commands that are available to execute with the **do** command, use the online help (?) function at the configuration mode prompt.

Note The **configure** and **describe** commands are not supported with the **do** command.

Task ID

Task ID	Operations
cisco-support	read

The following example shows how to execute an XR EXEC command from interface configuration mode. In this example, the **do** command displays output from the **show protocols** command within interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# interface tengige 0/1/0/1
RP/0/RP0/CPU0:router(config-if)# do show protocols

Routing Protocol "BGP 1"

Address Family IPv4 Unicast:
  Distance: external 20 internal 200 local 200
```

This command is available in the System Admin mode too.

```
sysadmin-vm:0_RP0(config)# do show running-config
Mon Mar  10 22:54:23.674 UTC
Mon Mar  10 22:54:23.675 UTC
```

```
fpd auto-upgrade disable
dump Bao
 0
  location 0/1
  !
 !
 1
  location 0/1
  !
```

end

To terminate a configuration session and return directly to XR EXEC modeSystem Admin EXEC mode , use the **end** command in any configuration mode.

end

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **end** command to exit any configuration mode and return directly to XR EXEC mode or System Admin EXEC mode. If you enter this command without committing the changes to the target configuration, you are prompted to do so:

```
Uncommitted changes found, commit them before exiting(yes/no/cancel)?[cancel]:
```

- Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns the router to XR EXEC mode or System Admin EXEC mode.

  If errors are found in the running configuration, the configuration session does not end. To view the errors, enter the **show configuration** (config) command with the **failed** keyword.

- Entering **no** exits the configuration session and returns the router to XR EXEC modeor System Admin EXEC mode without committing the configuration changes.
- Entering **cancel** leaves the router in the current configuration session without exiting or committing the configuration changes.

Note Entering **Ctrl-Z** is functionally equivalent to entering the **end** command.

Use the **abort** command to exit the configuration session and return to XR EXEC mode or System Admin EXEC mode without being prompted to commit changes and without saving changes to the target configuration.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to use the **end** command to end a configuration session. Changes stored in the target configuration are committed by answering **yes**.

```
RP/0/RP0/CPU0:router# configure
```

```
RP/0/RP0/CPU0:router(config)# interface tengige 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]: yes
RP/0/RP0/CPU0:router#


sysadmin-vm:0_RP0(config)# end
```

Related Topics

abort, on page 53
exit, on page 78
show configuration (config), on page 116

end-group

To exit from configuration group submode and return to global configuration mode, use the end-group command in group configuration mode.

end-group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Group configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

After you have included all configuration statements that you want in a particular configuration group, use the **end-group** command to exit group configuration mode.

Task ID

Task ID	Operation
config-services	read, write

This example shows how to complete the configuration of a configuration group and exit group configuration mode:

```
RP/0/RP0/CPU0:router(config)# group g-int-gige
RP/0/RP0/CPU0:router(config-GRP)# interface 'GigabitEthernet.*'
RP/0/RP0/CPU0:router(config-GRP-if)# mtu 1514
RP/0/RP0/CPU0:router(config-GRP-if)# end-group
RP/0/RP0/CPU0:router(config)#
```

Related Topics

group (configuration), on page 80

end-template

To exit template configuration mode and return to XR Config mode, use the **end-template** command in template configuration mode.

end-template

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

Template configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **end-template** command to exit template configuration mode after you have completed the template definition.

To define a template, use the **template** command. To apply a template to the target configuration, use the **apply-template** command. To view the contents of a template, use the **show running-config** command with the optional **template** *template-name* keyword and argument.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to enter template configuration mode, define a template named "hostname-template" and then exit from template configuration mode:

```
RP/0/RP0/CPU0:router(config)# template hostname-template
RP/0/RP0/CPU0:router(config-TPL)# hostname router-cs1
RP/0/RP0/CPU0:router(config-TPL)# end-template
RP/0/RP0/CPU0:router(config)#
```

Related Topics

end, on page 73

exclude-group

To exclude (or override) a configuration group (or groups) to be inherited by the router configuration, use the **exclude-group** command in the appropriate configuration mode. To delete the set exclusion, use the **no** form of this command.

exclude-group *group-name*

Syntax Description

group-name	Configuration group name that needs to be excluded.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

More than one configuration group can be excluded simultaneously. A maximum of eight groups can be specified at one time.

Note From Release 6.3.1 onwards, you can enter Flexible CLI config groups, **apply-group** and **exclude-group** command in any order as long as the entire commit has all the group definitions needed.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to delete the group G_interface using the **exclude-group** command:

```
RP/0/RP0/CPU0:router (config) # exclude-group G_interface

exclude-group G_INTERFACE
ipv4 address 12.21.50.100 255.255.0.0
!
interface GigabitEthernet0/0/0/1
ipv4 address 12.21.51.100 255.255.0.0
```

exit

To close an active terminal session and log off the router, use the **exit** command in XR EXEC mode orSystem Admin EXEC mode.

To return the router to the next higher configuration mode, use the **exit** command in any configuration mode.

exit

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Any configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To log off from a terminal session, enter the **exit** command in XR EXEC mode orSystem Admin EXEC mode.

When exiting from global or administration configuration mode to XR EXEC mode orSystem Admin EXEC mode, you are prompted to commit any uncommitted configuration changes.

```
Uncommitted changes found, commit them before exiting(yes/no/cancel)?[cancel]:
```

- Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns the router to XR EXEC mode orSystem Admin EXEC mode.

  If errors are found in the running configuration, the configuration session does not end. To view the errors, enter the **show configuration** (config) command with the **failed** keyword.
- Entering **no** exits the configuration session and returns the router to XR EXEC mode orSystem Admin EXEC mode without committing the configuration changes.
- Entering **cancel** leaves the router in the current configuration session without exiting or committing the configuration changes.

Note Entering the **exit** command from global configuration is functionally equivalent to entering the **end** command.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to return the router to the next higher command mode. In this example, the **exit** command exits from interface configuration mode and returns to global configuration mode. The **exit** command is entered a second time to exit from global configuration mode and return to XR EXEC mode. Because the configuration has not been committed explicitly (with the **commit** command), the system prompts to commit the configuration changes made during the session.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# exit
RP/0/RP0/CPU0:router(config)# exit
Uncommitted changes found, commit them before exiting(yes/no/cancel)?[cancel]: yes
```

The following example shows how to use the **exit** command from XR EXEC mode to log off from a terminal session:

```
RP/0/RP0/CPU0:router# exit

router con0_RP1_CPU0 is now available

Press RETURN to get started.
```

Related Topics

abort, on page 53
end, on page 73

group (configuration)

To define a configuration group containing configuration statements that can be applied in the router configuration, use the **group** command in global configuration mode. To remove a configuration group from the running configuration, use the **no** form of this command.

group *group-name config-statements*
no group *group-name*

Syntax Description

group-name	Name of the configuration group.
config-statements	Series of configuration statements, starting in global configuration mode, that comprise this configuration group.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **group** command enters group configuration mode where you can list a series of configuration statements that can then be used elsewhere in the router configuration. Most configuration commands can be used in group configuration mode. You must be in a user group associated with a task group that includes the appropriate task IDs for each of the command statements that you list within a configuration group.

The *group-name* argument is limited to 32 characters and is case-sensitive. It must not contain any of these special characters:

- ` - grave
- ' - single quote
- " - double quote
- < - less than
- > - greater than
- (- open parenthesis
-) - close parenthesis
- [- open bracket
-] - close bracket
- { - open brace

- } - close brace
- / - slash
- \ - backslash
- & - ampersand
- ^ - caret
- ! - exclamation point
- ? - question mark
- ~ - tilde
- * - asterisk
- % - percent sign
- = - equal sign
- , - comma
- + - plus sign
- | - vertical bar
- - space

A configuration group can be removed from the running configuration, only if it is not used by a configured **apply-group** command.

To exit from configuration group submode and return to global configuration mode, use the **end-group** command.

Regular expressions are used within the configuration statements to make them widely applicable. POSIX 1003.2 regular expressions are supported in the names of configuration statements. Single quotes are used to delimit a regular expression. For example, to specify the regular expression GigabitEthernet.* that matches all GigabitEthernet interfaces, enter the regular expression within single quotes as 'GigabitEthernet.*'.

To display a list of available interface types for your router configuration, enter **interface ?** at the configuration group prompt:

```
RP/0/RP0/CPU0:router(config-GRP)# interface ?

  ATM              'RegExp': ATM Network Interface(s)
  BVI              'RegExp': Bridge-Group Virtual Interface
  Bundle-Ether     'RegExp': Aggregated Ethernet interface(s)
  Bundle-POS       'RegExp': Aggregated POS interface(s)
  GigabitEthernet  'RegExp': GigabitEthernet/IEEE 802.3 interface(s)
  IMA              'RegExp': ATM Network Interface(s)
  Loopback         'RegExp': Loopback interface(s)
  MgmtEth          'RegExp': Ethernet/IEEE 802.3 interface(s)
  Multilink        'RegExp': Multilink network interface(s)
  Null             'RegExp': Null interface
  POS              'RegExp': Packet over SONET/SDH network interface(s)
  PW-Ether         'RegExp': PWHE Ethernet Interface
  PW-IW            'RegExp': PWHE VC11 IP Interworking Interface
  Serial           'RegExp': Serial network interface(s)
  tunnel-ip        'RegExp': GRE/IPinIP Tunnel Interface(s)
```

```
tunnel-mte       'RegExp': MPLS Traffic Engineering P2MP Tunnel interface(s)
tunnel-te        'RegExp': MPLS Traffic Engineering Tunnel interface(s)
tunnel-tp        'RegExp': MPLS Transport Protocol Tunnel interface
```

Note Although you are required to enter only enough characters for the interface type to be unique, it is recommended that you enter the entire phrase. All interface types used in regular expressions are case-sensitive.

For example, you can use the command `interface 'GigabitEthernet.*'`, but not `interface 'gigabite.*'`. To specify a subinterface, prefix the expression with the characters \. (backslash period), for example: `interface 'GigabitEthernet.*\..*'`. Refer to the *Configuring Flexible Command Line Interface Configuration Groups* module in the *System Management Configuration Guide for Cisco NCS 6000 Series Routers* for more extensive examples.

Task ID

Task ID	Operation
config-services	read, write

This example shows the definition of a configuration group to configure Gigabit Ethernet interfaces with ISIS routing parameters:

```
RP/0/RP0/CPU0:router(config)# group g-isis-gige
RP/0/RP0/CPU0:router(config-GRP)# router isis '.*'
RP/0/RP0/CPU0:router(config-GRP-isis)# interface 'GigabitEthernet.*'
RP/0/RP0/CPU0:router(config-GRP-isis-if)# lsp-interval 20
RP/0/RP0/CPU0:router(config-GRP-isis-if)# hello-interval 40
RP/0/RP0/CPU0:router(config-GRP-isis-if)# address-family ipv4 unicast
RP/0/RP0/CPU0:router(config-GRP-isis-if-af)# metric 10
RP/0/RP0/CPU0:router(config-GRP-isis-if-af)# end-group
RP/0/RP0/CPU0:router(config)#
```

To illustrate the use of this configuration group, assume that you want to configure Gigabit Ethernet interfaces with ISIS routing parameters, as shown here:

```
router isis green
 interface GigabitEthernet0/0/0/0
  lsp-interval 20
  hello-interval 40
  address-family ipv4 unicast
   metric 10
  !
 !
 interface GigabitEthernet0/0/0/1
  lsp-interval 20
  hello-interval 40
  address-family ipv4 unicast
   metric 10
  !
 !
 interface GigabitEthernet0/0/0/2
  lsp-interval 20
  hello-interval 40
  address-family ipv4 unicast
```

```
   metric 10
  !
 !
 interface GigabitEthernet0/0/0/3
  lsp-interval 20
  hello-interval 40
  address-family ipv4 unicast
   metric 10
  !
 !
!
```

There are three possible ways to use the configuration group to configure these interfaces. The first is by applying the group within the interface configuration, as shown here:

```
router isis green
 interface GigabitEthernet0/0/0/0
  apply-group g-isis-gige
  !
 !
 interface GigabitEthernet0/0/0/1
  apply-group g-isis-gige
  !
 !
 interface GigabitEthernet0/0/0/2
  apply-group g-isis-gige
  !
 !
 interface GigabitEthernet0/0/0/3
  apply-group g-isis-gige
 !
!
```

The second way to configure these interfaces using the configuration group is to apply the configuration group within the **router isis** configuration, as shown here:

```
router isis green
 apply-group g-isis-gige
 interface GigabitEthernet0/0/0/0
 !
 interface GigabitEthernet0/0/0/1
 !
 interface GigabitEthernet0/0/0/2
 !
 interface GigabitEthernet0/0/0/3
 !
!
```

In this situation, any other Gigabit Ethernet interfaces that you configure in ISIS green configuration inherit the configuration group configurations.

The third way to configure these interfaces using the configuration group is to apply the group at the global level, as shown here:

```
apply-group g-isis-gige
router isis green
 interface GigabitEthernet0/0/0/0
 !
 interface GigabitEthernet0/0/0/1
```

```
 !
 interface GigabitEthernet0/0/0/2
 !
 interface GigabitEthernet0/0/0/3
 !
!
```

In this example, the configuration of the group is applied to all Gigabit Ethernet interfaces configured for ISIS.

Related Topics

end-group, on page 75
apply-group, on page 59

hostname

To specify or modify the hostname for the router, use the **hostname** command in XR Config mode.

hostname *name*

Syntax Description

name	New hostname for the router.

Command Default

The factory-assigned default hostname is “ios.”

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

The hostname is used in prompts and default configuration filenames.

No blank or space characters are permitted as part of a name. Do not expect case to be preserved. Uppercase and lowercase characters look the same to many Internet software applications. It may seem appropriate to capitalize a name the same way you might do in English, but conventions dictate that computer names appear all lowercase. For more information, see RFC 1178, *Choosing a Name for Your Computer*.

Task ID

Task ID	Operations
root-lr	read, write

The following example shows how to change the router hostname:

```
RP/0/RP0/CPU0:router(config)# hostname router1
```

ipv6-enable

To enable IPv6, use **ipv6-enable** command in the XR Config. To disable IPv6, use the **no** form of this command.

ipv6-enable

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.6.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read

Examples

This example shows how enable ipv6 using the **ipv6-enable** command:

```
Router#configure terminal
Router(config)#interface CSI-Ether
Router(config-if)#ipv6 enable
Router(config-if)#ipv6 address 2001:0DB8:0:1::/64
Router(config-if)#exit
```

load commit changes

To populate the target configuration with changes from previous configuration commits, use the **load commit changes** command in XR Config mode.

load commit changes {*commit-id* | **since** *commit-id* | **last** *number-of-commits*}

Syntax Description

commit-id	Specific configuration commit.
since *commit-id*	Loads all configuration changes committed into the target buffer since (and including) a specific configuration commit, *commit-id*.
last *number-of-commits*	Loads the configuration changes into the target buffer that have been made during the last number of configuration commits specified with the *number-of-commits* argument.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load commit changes** command to populate the target configuration with changes from previous configuration commits. The changes are not applied until you enter the **commit** command.

Use the **show configuration** (config) command to display the target configuration.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with changes from a previous configuration commit:

```
RP/0/RP0/CPU0:router(config)# load commit changes since 1000000006

Building configuration...
Loading.
223 bytes parsed in 1 sec (222)bytes/sec
```

load configuration failed

To populate the target configuration with the contents of the previous failed configuration commit, use the **load configuration failed** command in XR Config mode.

load configuration failed {**commit** | **startup** [**previous** *number-of-reloads*] [**noerror**]}

Syntax Description

commit	Loads the failed configuration from the last commit.
startup	Loads the failed configuration from the startup configuration.
previous *number-of-reloads*	(Optional) Loads the failed configurations from a previous router reload. Valid *number-of-reloads* values are 1 to 4.
noerror	(Optional) Excludes the error reasons when the failed configurations are loaded.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load configuration failed** command to populate the target configuration with the contents of the previous failed configuration commit.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with the contents of the previous failed configuration commit:

```
RP/0/RP0/CPU0:router(config)# load configuration failed startup
Loading.
32 bytes parsed in 1 sec (31)bytes/sec
```

Related Topics

show configuration (config), on page 116

load rollback changes

To populate the target configuration with the contents of a previous configuration, use the **load rollback changes** command in XR Config mode.

load rollback changes {*commit-id* | **last** *number-of-commits* | **to** *commit-id*}

Syntax Description

commit-id	Rolls back the configuration changes for a specific configuration commit.
last *number-of-commits*	Rolls back to the configuration that existed before the last number of commits (specified with the *number-of-commits* argument) were made.
to *commit-id*	Rolls back to the running configuration that existed before the configuration specified with the *commit-id* argument.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load rollback changes** command to load rollback configuration changes to the target configuration. This command is similar to the **rollback configuration** command. The difference between the commands is that the **load rollback changes** command copies the rollback changes to the target configuration and does not commit the changes until the changes are explicitly committed with the **commit** command.

Use the **show configuration rollback changes** command to display rollback changes.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with the contents of a previous configuration:

```
RP/0/RP0/CPU0:router(config)# load rollback changes 1000000004

Building configuration...
Loading.
302 bytes parsed in 1 sec (301)bytes/sec
```

man

Cisco IOS XR software provides online help for standard command-line interface (CLI) commands using manual (man) pages. To display manual pages, use the **man** command in XR EXEC mode.

man {**command** *command-name* | **feature** [*feature-name*] | **keyword** *keywords*}

Syntax Description

command *command-name*	Displays the manual pages for a specific command. The *command-name* argument must include the complete command name.
feature [*feature-name*]	Displays all commands available in the feature. Use the **man** command with the **feature** keyword to list the available feature names.
keyword *keywords*	Displays a list of command names that match the keywords. Enter one or more keywords to match in a command. When entering multiple keywords, the keywords must be entered in the same sequential order as they are in the command.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You must have the documentation PIE installed before you can use the **man** command. If you attempt to run this command without the documentation PIE installed, an error is displayed as shown in the following example:

```
RP/0/RP0/CPU0:router# man command show install

Building index table...
Warning. Unable to get directory info for '/pkg/man' :No such file or directory.
 Discarding!
man [5521656]:Building index table failed. No entries found
```

For information about installing optional software PIEs, see the *Upgrading and Managing Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

Use the **man** command to display the manual pages for a specific command on the basis of the command name, a feature, or a keyword. Each man page contains the command name, syntax, command mode, usage, examples, and related commands.

The **man** command queries and displays command information about the router. A query can be based on keywords or a feature. The **feature** *feature-name* keyword and argument display all commands that match the feature. For example, entering **man feature ncs6k- base-1** displays all commands that match the **ncs6k**-base-1 feature. The **keyword** *keywords* keyword and argument display all commands that contain the specified keyword. For example, **man keyword ipv4** displays all commands that contain ipv4.

Task ID

Task ID	Operations
basic-services	read

The following example shows how to display the manual page for the **arp timeout** command:

```
RP/0/RP0/CPU0:router# man command arp timeout

COMMAND
arp timeout

DESCRIPTION


To specify how long dynamic entries learned on an interface remain in the
Address Resolution Protocol (ARP) cache, use the arp timeout command in
interface configuration mode. To remove the arp timeout command from the
configuration file and restore the system to its default condition with
respect to this command, use the no form of this command.

arp timeout seconds

no arp timeout<seconds>

SYNTAX DESCRIPTION

seconds
Time, in seconds, for which an entry remains in the ARP cache. The
range is from 0 to 4294967. A value of 0 means that entries are never
cleared from the cache. The default is 14400.

DEFAULTS

Entries remain in the ARP cache for 14400 seconds (4 hours).

COMMAND MODES

Interface configuration

COMMAND HISTORY

Release
Modification

Release 2.0
This command was introduced.
```

```
USAGE GUIDELINES

To use the arp timeout command, you must be a member of a user group
associated with the cef task ID.

For detailed information about user groups and task IDs, refer to the
Configuring AAA Services on Cisco IOS-XR Software module of the Cisco IOS-XR
System Security Configuration Guide.

This command is ignored when issued on interfaces that do not use ARP. Also,
ARP entries that correspond to the local interface or that are statically
configured by the user never time out.

The show interfaces command displays the ARP timeout value in
hours:minutes:seconds, as follows:

* * * * * * * * * * * * * * * * * START OF LISTING * * * * * * * * * * * * * * * * *

ARP type: ARPA, ARP Timeout 04:00:00
* * * * * * * * * * * * * * * * * END OF LISTING * * * * * * * * * * * * * * * * *

EXAMPLES

The following example shows how to set the ARP timeout to 3600 seconds to
allow entries to time out more quickly than the default:

* * * * * * * * * * * * * * * * * START OF LISTING * * * * * * * * * * * * * * * * *
RP/0/RP0/CPU0:router# configure

RP/0/RP0/CPU0:router(config)# interface MgmtEth 0/RP1/CPU0/0

RP/0/RP0/CPU0:router(config-if)# arp timeout 3600
* * * * * * * * * * * * * * * * * END OF LISTING * * * * * * * * * * * * * * * * *

RELATED COMMANDS

Command
Description

clear arp-cache
Deletes all dynamic entries from the ARP cache.

show arp (cache)
Displays the entries in the ARP table.

show interfaces
Displays statistics for all interfaces configured on the networking
device.
```

pwd (config)

To display the current configuration submode from a configuration submode, use the **pwd** command in any supported configuration submode.

pwd

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any subconfiguration mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following example shows how to use the **pwd** command from an interface configuration submode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/6/4/5
RP/0/RP0/CPU0:router(config-if)# pwd

interface TenGigE0/6/4/5
RP/0/RP0/CPU0:router(config-if)#
```

rollback configuration

To roll back the running configuration to a previous configuration, use the **rollback configuration** command in XR EXEC mode.

rollback configuration {**last** *number-of-commits* | **to** *commit-id*} [**best-effort**] [**comment** *line*] [**force**] [**label** *label*]

Syntax Description

last *number-of-commits*	Rolls back to the configuration that existed before the last number of commits (specified with the *number-of-commits* argument) were made.
to *commit-id*	Rolls back to the running configuration that existed before the configuration specified with the *commit-id* argument.
force	(Optional) Specifies to override any commit blocks.
label *label*	(Optional) Assigns a text label to this rollback. The *label* argument must begin with a letter.
comment*line*	(Optional) Assigns a text line to this rollback. The *line* argument can be up to 60 characters long.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Each time the **commit** command is entered, a commit ID is assigned to the new configuration. You can revert the system to the configuration of a previous commit ID with the **rollback configuration** command:

- Use the **to** keyword to revert to the configuration that existed *before* the configuration specified with the *commit-id* argument.
- Use the **last** keyword to revert to the configuration that existed *before* the last number of configuration commits (specified with the *number-of-commits* argument) were made.
- Use **show configuration commit list** to display a list of the commit IDs available for rollback operations.

Note The most recent 100 commits are retained by the system. As new commit IDs are added, the oldest commit IDs are discarded and are no longer available for rollback operations.

Use the **force** keyword to override commits that would fail otherwise. This is useful in the event of a low-memory condition on the router, to revert to a commit that would remove a configuration that caused the low-memory condition.

Note The rollback operation may fail if you try to rollback two (or more) commits where the individual commits involve the configuration and removing of the configuration of the same item, and there is a dependency of one item over another in any of the individual commit operations.

Task ID

Task ID	Operations
root-lr (EXEC)	read, write

Rolling Back to a Specific Commit ID

The following example shows how to roll back to a specific commit ID. In this example, the **show configuration commit list** command displays the available rollback points. The configuration is then rolled back to a prior commit with the **rollback configuration** command.

```
RP/0/RP0/CPU0:router# show configuration commit list

SNo. Label/ID    User      Line        Client      Time Stamp
~~~~ ~~~~~~~~    ~~~~      ~~~~        ~~~~~~      ~~~~~~~~~~
1    1000000009  lab       con0_0_C  Rollback    02:41:08 UTC Sun Sep 26 2009
2    1000000008  lab       con0_0_C  CLI         02:40:30 UTC Sun Sep 26 2009
3    1000000007  lab       con0_0_C  CLI         02:39:54 UTC Sun Sep 26 2009
4    1000000006  lab       con0_0_C  Rollback    02:38:40 UTC Sun Sep 26 2009
5    1000000005  lab       con0_0_C  CLI         02:37:35 UTC Sun Sep 26 2009
6    1000000004  lab       con0_0_C  CLI         02:37:04 UTC Sun Sep 26 2009

RP/0/RP0/CPU0:router# rollback configuration to 1000000008

Loading Rollback Changes.
Loaded Rollback Changes in 1 sec
Committing.
1 items committed in 1 sec (0)items/sec
Updating.RP/0/RP0/CPU0:Sep 26 02:42:09.318 : config_rollback[65707]: %LIBTARCFG-
6-COMMIT : Configuration committed by user 'lab'.   Use 'show commit changes 100
0000010' to view the changes.

Updated Commit database in 1 sec
Configuration successfully rolled back to '1000000008'.
```

Rolling Back to a Span of Configuration Commits

The following example shows how to roll back to the configuration that existed prior to the last two configuration commits:

```
RP/0/RP0/CPU0:router# rollback configuration last 2

Loading Rollback Changes.
Loaded Rollback Changes in 1 sec
Committing.
1 items committed in 1 sec (0)items/sec
Updating.
Updated Commit database in 1 sec
Configuration successfully rolled back 2 commits.
```

Related Topics

load rollback changes, on page 89

root

To return to configuration mode from a configuration submode, use the **root** command in any supported configuration submode.

root

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any subconfiguration mode except the following:

- The **root** command is not available under the route-policy submodes, because it requires the **end-policy** command to exit out of the configuration.
- The **root** command is not available in template submode, but is available in the submodes configurable under the template submode.

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

The following example shows how to use the **root** command to return to configuration mode from the interface configuration submode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# root
RP/0/RP0/CPU0:router(config)#
```

The following example shows how to use the **root** command from a submode configurable under the template submode. In this example, the **root** command is used to return to configuration mode from the username submode:

Note The recommended range for a user-defined username is 2-253 characters.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# template test
RP/0/RP0/CPU0:router(config-TPL)# username xyz
```

```
RP/0/RP0/CPU0:router(config-un)# root
RP/0/RP0/CPU0:router(config)# show conf

Building configuration...
template test
 username xyz
 !
 end-template
 end
```

Tip The **root** command is not available from the template submode, but is available in the submodes configurable under the template submode.

save configuration

To save the contents of a configuration to a file, use the **save configuration** command in XR Config mode.

save configuration running *device*:*directory-path*

Syntax Description

running	Saves the contents of the running configuration.
device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To save a configuration to a file, use the **save configuration** command.

To save a configuration that failed to a file, use the **save configuration failed** command.

Task ID

Task ID	Operations
config-services	read

The following example shows the configuration saved to disk0: from XR Config mode:

```
RP/0/RP0/CPU0:router(config)# save configuration disk0:sample3

Destination file name (control-c to abort): [/sample3]?
Building configuration.
1 lines built in 1 second
[OK]
```

Related Topics

save configuration commit changes, on page 101
save configuration failed, on page 103
save configuration merge, on page 105
save rollback changes, on page 106
Show configuration commit changes, on page 119

save configuration changes

To save the changes of a configuration to a file, use the **save configuration changes** command in XR Config mode.

save configuration changes *device*:*directory-path*

Syntax Description		
	device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To save the configuration changes to be made during a replace operation to a file, use the **save configuration changes** command.

Task ID

Task ID	Operations
config-services	read

The following example shows the configuration saved to disk0: from XR Config mode:

```
RP/0/RP0/CPU0:router(config)# save configuration changes disk0:sample3

Destination file name (control-c to abort): [/sample3]?
Building configuration.
1 lines built in 1 second
[OK]
```

Related Topics

save configuration commit changes, on page 101
save configuration failed, on page 103
save configuration merge, on page 105
save rollback changes, on page 106
Show configuration commit changes, on page 119

save configuration commit changes

To save the changes for a commit, or a series of commits, to a file, use the **save configuration commit changes** command in XR Config mode.

save configuration commit changes {*commit-id* | **last** *number-of-commits* | **since** *commit-id*} *device***:***directory-path*

Syntax Description

commit-id	Specific commit ID.
last *number-of-commits*	Saves changes made in the most recent *number-of-commits*.
since *commit-id*	Saves changes made since (and including) a specific *commit-id*.
device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **save configuration commit changes** command to save the changes made in a commit operation to a file. You can specify a specific commit ID, all the changes since a specified commit ID, or the changes that occurred during the last *n* commits.

Task ID

Task ID	Operations
config-services	read

The following example saves the changes from the last two commit operations to disk0:

```
RP/0/RP0/CPU0:router(config)# save configuration commit changes last 2 disk0:sample1

Destination file name (control-c to abort): [/sample1]?
Building configuration.
5 lines built in 1 second
[OK]
```

Related Topics

save configuration, on page 99

save configuration changes, on page 100
save configuration failed, on page 103
save configuration merge, on page 105
save rollback changes, on page 106
show configuration history, on page 127
Show configuration commit changes, on page 119

save configuration failed

To save the contents of the failed configuration, use the **save configuration failed** command in XR Config mode.

save configuration failed {**load** | **noerrors** | **startup** [**previous** *number*] [**noerror**]} *device* **:** *directory-path*

Syntax Description

load	Saves the failed configuration (syntax errors) in the last reload.
noerrors	Excludes the error reasons from the saved configuration.
startup	Saves the failed configuration during startup.
previous *number*	Saves a failed startup configuration from the specified previous sessions. The *number* argument is a value between 1 and 4 that indicates how many failed startup configurations to save.
device: directory-path	Storage device and directory path of the configuration file to be saved.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To save a configuration to a file, use the **save configuration** command.

To save a configuration that failed to a file, use the**save configuration failed** command.

To save a configuration that failed during startup to a file, use the **save configuration failed** command with the **startup** keyword.

Task ID

Task ID	Operations
config-services	read

The following example saves the failed configuration to disk0:

```
RP/0/RP0/CPU0:router(config)# save configuration failed disk1:/configs
```

Related Topics

save rollback changes, on page 106

show configuration history, on page 127
Show configuration commit changes, on page 119

save configuration merge

To save the contents of a merged configuration to a file, use the **save configuration merge** command in XR Config mode.

save configuration merge *device*:*directory-path*

Syntax Description		
	device : *directory-path*	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

The following example shows the configuration saved to disk0:

```
RP/0/RP0/CPU0:router(config)# save configuration merge disk0:sample3

Destination file name (control-c to abort): [/sample3]?
Building configuration.
1 lines built in 1 second
[OK]
```

Related Topics

save rollback changes, on page 106
show configuration history, on page 127
Show configuration commit changes, on page 119

save rollback changes

To save the rollback changes, use the **save rollback changes** command in XR Config mode.

save rollback changes {*commit-id* | **last** *number-of-commits* | **to commit-id**} *device*:*directory-path*

Syntax Description

commit-id	Specific commit ID.
last *number-of-commits*	Saves the rollback changes for the last *n* commits
to *commit-id*	Saves rollback changes up to a specific *commit-id*.
device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **save rollback changes** command to save the changes that would be made in a configuration rollback to a specific commit point or for a series of commits.

Task ID

Task ID	Operations
config-services	read

The following example shows that the rollback changes for the commit point 5 are saved to the file sample4 on disk0:

```
RP/0/RP0/CPU0:router(config)# save rollback changes last 1 disk0:sample4

Destination file name (control-c to abort): [/sample4]?
Building configuration.
6 lines built in 1 second
[OK]
```

Related Topics

save configuration, on page 99
save configuration commit changes, on page 101
show configuration history, on page 127

set default-afi

To set the default address family identifier (AFI) for the current session, use the **set default-afi** command in XR EXEC mode.

set default-afi {**all** | **ipv4** | **ipv6**}

Syntax Description

all	Sets the default AFI to IPv4 and IPv6 for the current session.
ipv4	Sets the default AFI to IPv4 for the current session. This is the default setting.
ipv6	Sets the default AFI to IPv6 for the current session.

Command Default

The default AFI setting is set to IPv4 for all sessions.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **set default-afi** command to set the default AFI for the current session. This command acts as a keystroke shortcut for **show** commands. If the default AFI setting is set to IPv4, then you would not have to specify the **ipv4** keyword for **show** commands that support the **ipv4** keyword. For example, if the AFI setting is set to IPv4, you could issue the **show route** command without specifying the **ipv4** keyword to display IPv4 routes in the Routing Information Base (RIB).

Use the **show default-afi-safi-vrf** command to display the default AFI setting.

Task ID

Task ID	Operations
basic-services	read, write

The following example shows how to set the default AFI to IPv6:

```
RP/0/RP0/CPU0:router# set default-afi ipv6

%% Default Address Family Identifier is set to 'ipv6'
```

Related Topics

set default-safi, on page 108
set default-vrf, on page 109
show default-afi-safi-vrf, on page 136

set default-safi

To set the default subaddress family identifier (SAFI) for the current session, use the **set default-safi** command in XR EXEC mode.

set default-safi {**all** | **multicast** | **unicast**}

Syntax Description

all	Sets the default SAFI to multicast and unicast for the current session.
multicast	Sets the default SAFI to multicast for the current session.
unicast	Sets the default SAFI to unicast for the current session. This is the default setting.

Command Default

The default SAFI setting is set to unicast for all sessions.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **set default-safi** command to set the default SAFI setting for the current session. This command acts as a keystroke shortcut for **show** commands. If the default SAFI setting is set to unicast, you would not have to specify the **unicast** keyword for **show** commands that support that keyword. For example, if the default SAFI setting is set to unicast, you could issue the **show router** command without specifying the **unicast** keyword to display information about unicast address prefixes in the Routing Information Base (RIB).

Use the **show default-afi-safi-vrf** command to display the default SAFI setting.

Task ID

Task ID	Operations
basic-services	read, write

The following example shows how to set the default SAFI to multicast:

```
RP/0/RP0/CPU0:router# set default-safi multicast

%% Default Sub-Address Family Identifier is set to 'multicast'
```

Related Topics

set default-afi, on page 107
set default-vrf, on page 109
show default-afi-safi-vrf, on page 136

set default-vrf

To set the default VPN routing and forwarding (VRF) instance for the current session, use the **set default-vrf** command in XR EXEC mode.

set default-vrf {*name* | **none**}

Syntax Description

name	Default VPN routing and forwarding name.
none	Sets the default VPN routing and forwarding name to empty.

Command Default

The default VRF setting is set to empty.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **set default-vrf** command to set the default VRF setting for the current session. This command acts as a keystroke shortcut for **show** commands. For example, if the default VRF is configured, you can issue the **show route** command without specifying the VRF name.

When the default VRF for the session is set to **none**, then IPv4 routes for the system default VRF are displayed.

Note To override the default VRF setting, specify the VRF name in the **show** command.

Use the **show default-afi-safi-vrf** command to display the default VRF setting.

Task ID

Task ID	Operations
basic-services	read, write

In the following example, the default VRF is set to “dft_vrf:”

```
RP/0/RP0/CPU0:router# set default-vrf dft_vrf

  %% Default Virtual Routing/Forwarding is set to 'dft_vrf'
```

In the following command, the **show route** command is entered without specifying a VRF name. The results for the "dft_vrf" VRF are displayed because the default VRF was set to “dft_vrf.”

```
RP/0/RP0/CPU0:router# show route ipv4

  % No matching vrf found
```

When the default VRF for the session is set to **none**, the system default VRF routes are displayed. In the following example, the default VRF is set to (empty) and the **show route** command displays the system default VRF information:

```
RP/0/RP0/CPU0:router# set default-vrf none

%% Default Virtual Routing/Forwarding is set to ''

RP/0/RP0/CPU0:router# show route ipv4

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local

Gateway of last resort is 12.29.0.1 to network 0.0.0.0

  S*   0.0.0.0/0 [1/0] via 12.29.0.1, 00:31:30
  L    10.10.10.10/32 is directly connected, 3d02h, Loopback1
  C    12.29.0.0/16 is directly connected, 00:31:30, MgmtEth0/0/CPU0/0
  L    12.29.56.21/32 is directly connected, 00:31:30, MgmtEth0/0/CPU0/0
```

Related Topics

set default-afi, on page 107
set default-safi, on page 108
show default-afi-safi-vrf, on page 136

show aliases

To display all defined aliases or the aliases defined in a specified mode, use the **show aliases** command in XR EXEC mode.

show aliases

Syntax Description

This command has no keywords or arguments.

Command Default

Displays all aliases currently configured on the system.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show aliases** command to display all aliases currently configured on the system.

Task ID

Task ID	Operations
basic-services	read

The following example illustrates sample output from the **show aliases** command. The output displays a summary of all the command aliases configured.

```
RP/0/RP0/CPU0:router# show aliases

exec mode aliases:
ipv4_brief              show ipv4 interface brief

interface mode aliases:
sample_int              tengige 0/2/0/0
```

Related Topics

alias, on page 56

show apply-group

To display the applied configuration groups, use the **show apply-group** command in EXEC mode.

show apply group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The output of this show command indicates if the group is a part of the global apply-group or is a part of the sub-mode level apply-group.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show apply-group** command:

```
RP/0/RP0/CPU0:router #  show apply-group
              Global       Non-Global
Groups Reference Count Reference Count
------ --------------- ---------------
B                1             0
C                1             0
```

Reference count can either be 0 ro 1. 0 indicates that the group is not applied globally; 1 indicates that the group is globally applied.

show commit changes diff

To display the difference between the currently running configuration and the target configuration (the configuration before the commit command), use the **show commit changes diff** command in the appropriate mode.

show commit changes diff

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Command History

Release	Modification
Release 5.2.0	This command was introduced.
Release 5.2.1	Class-map was supported.
Release 5.3.1	Policy-map was supported.

Usage Guidelines

The **show commit changes diff** command displays the output by prepending symbols based on the configuration event:

Symbol	Event
+	Add
-	Delete
<-	Modify for old value
+>	Modify for new value

Task ID

Task ID	Operations
config-services	read

This example shows the output of **show commit changes diff** command for adding a policy-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
+  policy-map pshow
+   class c1
+    set precedence 1
+   !
+   class c2
+    police rate 100 kbps
+    !
+   !
+   class class-default
+   !
+   end-policy-map
```

```
+  !
```

This example shows the output of **show commit changes diff** command for adding a class-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
 !
+  class-map match-any c
+   match precedence 1 2 3
+   match qos-group 2
+   end-class-map
end
```

This example shows the output of **show commit changes diff** command for deleting a policy-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
-  policy-map pshow
-   class c1
-    set precedence 1
-   !
-   class c2
-    police rate 100 kbps
-    !
-   !
-   class class-default
-   !
-   end-policy-map
-  !
```

This example shows the output of **show commit changes diff** command for deleting a class-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
  !
-  class-map match-any c1
-   match precedence 1
-   end-class-map
end
```

This example shows the output of **show commit changes diff** command for modifying a policy-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
   policy-map pshow
   -  class c1
   -   set precedence 1
    !
    class c2
   <-  police rate 100 kbps
   +>  police rate 200 kbps
      !
   +    set precedence 1
    !
   +   class c3
   +    shape average 100 kbps
     !
    end-policy-map
   !
end
```

This example shows the output of **show commit changes diff** command for modifying a class -map:

```
RP/0/RP0/CPU0:router# show commit changes diff
   policy-map pshow
  class-map match-any c
    - match precedence 1 2 3
    <- match qos-group 2
    +> match qos-group 2 4 5
    + match dscp 1 2 3
  end-class-map
```

show configuration (config)

To display information about the current configuration session (target configuration), use the **show configuration** command in any configuration mode.

show configuration [**merge**] [**running**]

Syntax Description

merge	(Optional) Displays the configuration that occurs if the contents of the uncommitted changed (target configuration) are committed to the running configuration.
running	(Optional) Displays the running (committed) configuration.

Command Default

When the **show configuration** command is entered without an argument, the uncommitted changes to the target configuration are displayed.

Command Modes

Any configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration** command to display details on uncommitted configuration changes.

Use the **show configuration** command with the **running** keyword to display the running (active) configuration.

Prior to committing the target configuration, use the **show configuration** command with the **merge** keyword from any configuration mode to display the result of merging the target configuration with the running configuration.

Task ID

Task ID	Operations
basic-services	read

In this example, the **show configuration** command displays uncommitted changes made during a configuration session:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige0/3/0/3
RP/0/RP0/CPU0:router(config-if)# description faq
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.10.11.20 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# show configuration

Building configuration...
interface TenGigE0/3/0/3
 description faq
 ipv4 address 10.10.11.20 255.0.0.0
```

```
 end
```

The following example shows sample output from the **show configuration** command with the optional **merge** keyword. The command is entered during a configuration session. The output displays the result of merging the target and running configuration, without committing the changes.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige0/3/0/3
RP/0/RP0/CPU0:router(config-if)# description faq
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.10.11.20 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# show configuration merge

Building configuration...
hostname router
interface TenGigE0/0/0/0
 ipv4 address 1.2.3.4 255.0.0.0
 exit
interface TenGigE0/3/0/3
 description faq
 ipv4 address 1.1.1.1 255.0.0.0
 shutdown
 end
```

Related Topics

show configuration failed (config), on page 123
show configuration history, on page 127
show configuration sessions, on page 134
show running-config, on page 138
Show configuration commit changes, on page 119

show configuration changes

To display the configuration changes to be made during a replace operation, use the **show configuration changes** command in XR ConfigSystem Admin Config mode .

show configuration changes [**diff**]

Syntax Description

diff	(Optional) Displays the changes in UNIX-like format.

Command Default

None

Command Modes

XR Config mode

System Admin Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read
basic-services	read

The following example shows the changes to be made during a replace operation:

Show configuration commit changes

To display the changes made to the running configuration by previous configuration commits, a configuration commit, or for a range of configuration commits, use the **show configuration commit changes** command in EXEC, administration EXEC, administration configuration, or global configuration mode.

show configuration commit changes {*commit-id* | **since** *commit-id* | **last** *number-of-commits* } [**diff**]

Syntax Description

since	Displays all changes committed to the running configuration since (and including) a specific configuration commit.
commit-id	Displays configuration changes for a specific configuration commit.
last *number-of-commits*	Displays the changes made to the running configuration during the last number of configuration commits specified for the *number-of-commits* argument.
diff	(Optional) Displays added lines, changed lines, and deleted lines.

Command Default

None

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 3.9.0	No modification.

Usage Guidelines

Each time a configuration is committed with the **commit** command, the configuration commit operation is assigned a commit ID. The **show configuration commit changes** command displays the configuration changes made since the specified commit.

To display a list of the available commit IDs, enter the **show configuration commit list** command. You can also display the commit IDs by entering the **show configuration commit changes** command with the online help function (**?**).

You can't view commit IDs from a different release if the syntax or semantics of the configuration changed in the current release.

Note Syntax of a configuration refers to its structure and format, while the semantics of a configuration refers to its backend interpretation.

Task ID

Task ID	Operations
config-services	read

The following example shows sample output from the **show configuration commit changes** command. The output displays commit IDs.

```
RP/0/RP0/CPU0:router# show configuration commit list

SNo. Label/ID    User      Line        Client      Time Stamp
~~~~ ~~~~~~~~    ~~~~      ~~~~        ~~~~~~      ~~~~~~~~~~
1    1000000077  lab       con0_1_C  CLI         15:42:45 UTC Fri Jan 30 2009
2    1000000076  lab       con0_1_C  Rollback    15:30:39 UTC Fri Jan 30 2009
3    1000000075  lab       con0_1_C  Rollback    15:25:26 UTC Fri Jan 30 2009
4    1000000074  lab       con0_1_C  Rollback    15:04:29 UTC Fri Jan 30 2009
5    1000000073  lab       con0_1_C  CLI         14:49:07 UTC Fri Jan 30 2009
6    1000000072  lab       con0_1_C  CLI         14:48:35 UTC Fri Jan 30 2009
```

The following example shows sample output from the **show configuration commit changes** command with the *commit-id* argument. In this example, the output displays the changes made in the configuration commit assigned commit ID 1000000077.

```
RP/0/RP0/CPU0:router# show configuration commit changes 1000000077

Building configuration...
alias exec shrun show configuration running
alias exec shver show version
end
```

The following example shows sample output from the **show configuration commit changes** command with the **since** *commit-id* keyword and argument. In this example, the output displays the configuration changes made since the configuration commit assigned commit ID 1000000077 was committed.

```
RP/0/RP0/CPU0:router# show configuration commit changes since 1000000077

Building configuration...
no hw-module node 0/RP0/CPU0 shutdown
hostname router
logging trap
no logging console
logging history size 1
alias exec shrun show configuration running
alias exec shver show version
interface MgmtEth0/RP1/CPU0/0
 ipv4 address 12.25.34.10 255.255.0.0
 no shutdown
 !
 interface preconfigure MgmtEth0/RP0/CPU0/0
 no shutdown
```

```
 !
no route ipv4 0.0.0.0/0 12.7.0.1
route ipv4 0.0.0.0/0 12.25.0.1
route ipv4 223.255.254.254/32 12.25.0.1
telnet ipv4 server enable
end
```

The following example shows sample output from the **show configuration commit changes** command with the **diff** keyword. In the display, the following symbols signify changes:

+ indicates an added line.

– indicates a deleted line.

# indicates a modified line.

```
RP/0/RP0/CPU0:router# show configuration commit changes last 1 diff

Building configuration...
+ interface Loopback1000
+ ipv4 address 190.190.180.1 255.255.255.255
!
end

+ interface Loopback1000
+ ipv4 address 190.190.180.1 255.255.255.255
  !
  end
```

Related Topics

rollback configuration, on page 94

show configuration failed

To display information about a configuration that failed during the last commit , use the **show configuration failed** command in EXEC mode.

show configuration failed [**inheritance**]

Syntax Description

inheritance	Displays the failed configuration details at the inheritance level.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Without the inheritance keyword, this command displays the failed configuration information in brief.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to run the **show configuration failed** command:

Note When there are two (or more) groups that have failed, the ordering of the failed groups is displayed in the same order as the apply-group statement.

```
RP/0/RP0/CPU0:router (config) #  show config failed
!! SEMANTIC ERRORS: This configuration was rejected by
!! the system due to semantic errors. The individual
!! errors with each failed configuration command can be
!! found below.
apply-group GROUP-1 GROUP-2 GROUP-3 GROUP-4 GROUP-5
!% Please issue "show configuration failed inheritance" for details.
Applying following groups failed: GROUP-2 GROUP-4 GROUP-5
```

show configuration failed (config)

To display information about a configuration that failed during the last commit, use the **show configuration failed** command in any configuration mode.

show configuration failed [{**load** | **noerrors**}]

Syntax Description

load	(Optional) Displays any syntax errors found in a configuration loaded with the **load** command.
noerrors	(Optional) Displays the configuration that failed in last commit without the error reasons.

Command Default

Displays the details of the failed configuration including error reasons.

Command Modes

Any configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
basic-services	read

The following example shows a failed commit operation:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# taskgroup bgp
RP/0/RP0/CPU0:router(config-tg)# description this is an example of an invalid task group
RP/0/RP0/CPU0:router(config-tg)# commit
% Failed to commit one or more configuration items.
Please use 'show configuration failed' to view the errors
```

The following example shows sample output from the **show configuration failed** command. The output displays the configuration items that failed during the last commit operation.

```
RP/0/RP0/CPU0:router(config-tg)# show configuration failed

!! CONFIGURATION FAILED DUE TO SEMANTIC ERRORS
taskgroup bgp
!!% Usergroup/Taskgroup names cannot be taskid names
!
```

The following example shows sample output from the **show configuration failed** command with the optional **no errors** keyword. The output displays the configuration items that failed during the last commit operation without an error description.

```
RP/0/RP0/CPU0:router(config-tg)# show configuration failed noerrors

!! CONFIGURATION FAILED DUE TO SEMANTIC ERRORS
taskgroup bgp
!
```

Related Topics

show configuration (config), on page 116
show configuration history, on page 127
show configuration running, on page 133
show configuration sessions, on page 134
show running-config, on page 138
Show configuration commit changes, on page 119

show configuration failed remove

To display information about a configuration that failed while being removed during installation operations, use the **show configuration failed remove** command in XR EXEC mode.

show configuration failed remove

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

The following example shows a failed commit operation:

```
RP/0/RP0/CPU0:router# show configuration failed remove

!! SEMANTIC ERRORS: This configuration was rejected by
!! the system due to semantic errors. The individual
!! errors with each failed configuration command can be
!! found below.

multicast-routing
 no address-family ipv4
 !!% Process did not respond to sysmgr
 address-family ipv4
  no interface all enable
!!% Process did not respond to sysmgr
!
!
```

Related Topics

show configuration (config), on page 116
show configuration failed (config), on page 123
show configuration history, on page 127
show configuration running, on page 133
show configuration sessions, on page 134

show running-config, on page 138
Show configuration commit changes, on page 119

show configuration history

To display a history of configuration events, use the **show configuration history** command in XR EXECor XR Config mode.

show configuration history [{**alarm** | **backup** | **cfs-check** | **commit** | **rebase** | **shutdown** | **startup**}] [{**first** *number* | **last** *number* | **reverse**}] [**detail**]

Syntax Description

alarm	(Optional) Displays alarm events.
backup	(Optional) Displays configuration backup events.
cfs-check	(Optional) Displays CFS check events.
commit	(Optional) Displays commit events.
rebase	(Optional) Displays commit database consolidation events.
shutdown	(Optional) Displays shutdown events.
startup	(Optional) Displays startup events, including alternate configurations, failed configurations, and other events.
first *number*	(Optional) Displays the first x number of events, where x is the *number* argument.
last *number*	(Optional) Displays the last *x number* events. Replace with the number of events to display.
reverse	(Optional) Displays the most recent events first.
detail	(Optional) Displays detailed information, including comments.

Command Default

When entered without any optional arguments or keywords, this command displays all configuration events. The oldest events are displayed at the top of the list for each event type.

Command Modes

XR EXEC

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration history** command to display information about the last (up to) 1500 configuration events.

Use one of the available keywords to display the configuration event only for that event type. Use the **first** *number* and **last** *number* keywords and arguments to display a specified number of events. Use the **reverse** keyword to display the newest events at the top of the list.

Task ID

Task ID	Operations
config-services	read

In the following example, the **show configuration history** command is used to display the history of all configuration events for an SDR:

```
RP/0/RP0/CPU0:router# show configuration history

Sno.  Event      Info                           Time Stamp
~~~~  ~~~~~      ~~~~                           ~~~~~~~~~~
1     alarm      inconsistency alarm raised     Thu Jun 22 15:23:15 2009
2     startup    configuration applied          Thu Jun 22 15:23:32 2009
3     OIR config restore                        Thu Jun 22 15:23:25 2009
4     OIR config restore                        Thu Jun 22 15:23:33 2009
5     OIR config restore                        Thu Jun 22 15:23:33 2009
6     OIR config restore                        Thu Jun 22 15:23:34 2009
7     OIR config restore                        Thu Jun 22 15:23:34 2009
8     OIR config restore                        Thu Jun 22 15:23:35 2009
9     OIR config restore                        Thu Jun 22 15:23:36 2009
10    OIR config restore                        Thu Jun 22 15:23:37 2009
11    OIR config restore                        Thu Jun 22 15:23:37 2009
12    OIR config restore                        Thu Jun 22 15:23:38 2009
13    OIR config restore                        Thu Jun 22 15:23:38 2009
14    OIR config restore                        Thu Jun 22 15:23:39 2009
15    OIR config restore                        Thu Jun 22 15:23:39 2009
16    OIR config restore                        Thu Jun 22 15:23:40 2009
17    OIR config restore                        Thu Jun 22 15:23:40 2009
18    OIR config restore                        Thu Jun 22 15:23:42 2009
19    OIR config restore                        Thu Jun 22 15:23:42 2009
20    OIR config restore                        Thu Jun 22 15:23:42 2009
21    OIR config restore                        Thu Jun 22 15:23:43 2009
 --More--
```

In the following example, the **show configuration history** command is used to display only the startup configuration events:

```
RP/0/RP0/CPU0:router# show configuration history startup

Sno.  Event      Info                           Time Stamp
~~~~  ~~~~~      ~~~~                           ~~~~~~~~~~
1     startup    configuration applied          Thu Jun 22 15:23:32 2009
2     startup    configuration applied          Sat Jul  1 15:02:24 2009
3     startup    configuration applied          Sat Jul  8 17:36:52 2009
4     startup    configuration applied          Sun Jul  9 13:40:27 2009
5     startup    configuration applied          Sat Jul 15 18:18:54 2009
```

In the following example, the **show configuration history** command with the **commit detail** keywords is used to display additional details regarding the commit events:

```
RP/0/RP0/CPU0:router# show configuration history commit detail

1)  Event: commit         Time: Thu Jun 22 15:44:33 2009
     Commit ID: 1000000001 Label:
     User: lab        Line: vty0
     Client: CLI           Comment:

2)  Event: commit         Time: Thu Jun 22 16:58:18 2009
```

```
     Commit ID: 1000000002 Label:
     User: lab        Line: vty2
     Client: CLI           Comment:

3)   Event: commit         Time: Thu Jun 22 16:58:39 2009
     Commit ID: 1000000003 Label:
     User: lab        Line: vty2
     Client: CLI           Comment:

4)   Event: commit         Time: Sat Jul  1 15:29:31 2009
     Commit ID: 1000000001 Label:
     User: lab        Line: vty0
     Client: CLI           Comment:

5)   Event: commit         Time: Sat Jul  1 15:32:25 2009
     Commit ID: 1000000002 Label:
     User: lab        Line: vty0
  --More--
```

Table 12: show configuration history Field Descriptions

Field	Description
SNo.	Serial number of the entry.
Event	Type of configuration event.
Info	Summary of the configuration action.
Time Stamp	Time and date when the event was run.
Label/ID	If a label was assigned to a commit, the first 10 characters display; otherwise, the autogenerated commit ID displays.
User	User who issued the command.
Line	Line in which the user session was established. In some cases, this field may display "UNKNOWN" or "SYSTEM". These fields indicate that an internal action was made by the system.
Client	The management interface used to make the event.

Related Topics

show configuration (config), on page 116
show configuration failed (config), on page 123
show configuration history, on page 127
show configuration running, on page 133
show configuration sessions, on page 134
show running-config, on page 138
Show configuration commit changes, on page 119

show configuration inconsistency replica

To display any configuration inconsistencies on a replica node, use the **show configuration inconsistency replica** command in XR EXEC mode.

show configuration inconsistency replica location *node-id* [**detail**]

Syntax Description

location *node-id*	Displays any configuration inconsistencies on the designated node. The *node-id* argument is expressed in the *rack/slot* notation.
detail	Displays a detailed list of inconsistencies.

Command Default

XR EXECmode: Displays configuration inconsistencies for an SDR configuration.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

In EXEC mode, the replica nodes are the route processors (RPs) that can become the designated secure domain router system controller (DSDRSC).

Use the **show configuration inconsistency replica** command, before performing a manual switchover or DSC migration, to verify that the node in line to take over for the DSC or DSDRSC is in good shape. If any problems are reported, use the **clear configuration inconsistency replica** command to correct them.

Task ID

Task ID	Operations
config-services	read

The following example shows a configuration with inconsistencies:

```
RP/0/RP0/CPU0:router# show configuration inconsistency replica location 0/rp1/cpu0

The replica at location 0/RP1/CPU0 is inconsistent.
Please run 'clear configuration inconsistency replica location 0/RP1/CPU0'.
```

The following example shows sample output after the inconsistencies have been resolved:

```
RP/0/RP0/CPU0:Router# show configuration inconsistency replica location 0/rp1/cpu0

Replica is consistent
```

show configuration persistent

To display the persistent configuration, use the **show configuration persistent** command in XR EXEC mode.

show configuration persistent [**diff**]

Syntax Description

diff	(Optional) Displays the difference between the running configuration and persistent configuration. This option is available only on the DSDRSC .

Command Default

If no argument is specified, the **show configuration persistent** command displays the entire contents of the persistent configuration file.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The persistent configuration is the configuration stored in nonvolatile memory, from which the running configuration is restored after the router is reloaded. The running configuration should be the same as the persistent configuration. Use the **show configuration persistent** command with the **diff** keyword to check if there is a difference between the running configuration and the persistent configuration.

Task ID

Task ID	Operations
config-services	read

The following example shows that there is no difference between the running configuration and the persistent configuration:

```
RP/0/RP0/CPU0:router# show configuration persistent diff

Building configuration...
  end
```

The following example shows a difference between the running configuration and the persistent configuration:

```
RP/0/RP0/CPU0:router# show configuration persistent diff

Building configuration...
router vrrp
interface tengige0/1/0/1.1
vrrp 1 preempt delay 300
```

```
!
interface tengiget0/1/0/1.2
vrrp 1 preempt delay 300
!
interface tengige0/1/0/1.3
vrrp 1 preempt delay 300
```

Related Topics

show running-config, on page 138

show configuration running

To display the running configuration, use the **show configuration running** command in the appropriate mode.

show configuration running [*config-keyword*]

Syntax Description

config-keyword	(Optional) Specific configuration to display.

Command Default

None

Command Modes

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration running** command to display the currently active configuration.

Task ID

Task ID	Operations
basic-services	read

This example shows the currently running (committed) configuration from administration mode.

```
RP/0/RP0/CPU0:router(admin)# show configuration running

Building configuration...
username lab
 secret 5 $1$XNWt$j8RscNdncKSRoMSnqSpbj/
 group root-system
!
end
```

Related Topics

show configuration (config), on page 116
show configuration failed (config), on page 123
show configuration history, on page 127
show configuration sessions, on page 134
show running-config, on page 138
Show configuration commit changes, on page 119

show configuration sessions

To display the active configuration sessions, use the **show configuration sessions** command in XR EXEC mode.

show configuration sessions [**detail**]

Syntax Description

detail	(Optional) Displays detailed information.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration sessions** command to display the active configuration sessions. Use the **clear configuration sessions** command to clear a configuration session. The **show configuration sessions** command can be used with the **clear configuration sessions** command to verify that an active configuration session was cleared.

Task ID

Task ID	Operations
config-services	read

The following example shows sample output from the **show configuration sessions** command:

```
RP/0/RP0/CPU0:router# show configuration sessions

Current Configuration Session  Line       User     Date                     Lock
00000050-001200bb-00000000     con0_5_CPU cisco    Fri Feb 16 17:23:47 2007
```

Table 13: show configuration sessions Field Descriptions

Field	Description
Session	System-generated configuration session ID number.
Line	Line in which the user session was established. In some cases, this field may display “UNKNOWN” or “SYSTEM.” These fields indicate that an internal commit was made by the system.
User	User who initiated the configuration session.
Date	Time and date the configuration session was started.

Field	Description
Lock	Locked running-configuration. An asterisk (*) displayed in this field means the session has been locked. Only one session can lock the running configuration at a time.

show default-afi-safi-vrf

To display the default address family identifier (AFI), subaddress family identifier (SAFI), and VPN routing and forwarding (VRF) instance for the current session, use the **show default-afi-safi-vrf** command in XR EXEC mode.

show default-afi-safi-vrf

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show default-afi-safi-vrf** command to display the default AFI and SAFI settings for the current session. The AFI and SAFI settings are controlled by the following commands:

- set default-afi, on page 107
- set default-safi, on page 108
- set default-vrf, on page 109

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show default-afi-safi-vrf** command:

```
RP/0/RP0/CPU0:router# show default-afi-safi-vrf

%% Default AFI/SAFI/VRF for this session is:
     Address Family Identifier:       'ipv4'
     Sub-Address Family Identifier:   'unicast'
     Virtual Routing/Forwarding:      ''
```

Related Topics

set default-afi, on page 107
set default-safi, on page 108
set default-vrf, on page 109

snmp-server script

To map the script file with custom OID, use the **snmp-server script** command in

XR Config

mode.

snmp-server script script-oid *oid-number* **script-filename** *file-name*

Syntax Description

script-oid*oid-number*	The OID number to be added as custom OID. The custom OID number has to be followed by root OID 1.3.6.1.4.1.9.9.999998.
script-filename*file-name*	The name of the script file to be mapped.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.5.3	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read,write

Examples

This example shows how to map the script file with custom OID.

```
Router(config)#snmp-server script script-oid 1.3.6.1.4.1.9.9.999998.10 script-filename
show_lldp_string.py
```

show running-config

To display the contents of the currently running configuration or a subset of that configuration, use the **show running-config** command in the appropriate mode.

show running-config [[**exclude**] *command*] [**sanitized**]

Syntax Description

exclude	(Optional) Excludes a specific configuration from the display.
command	(Optional) Command for which to display the configuration.
sanitized	(Optional) Displays a sanitized configuration for safe distribution and analysis.

Command Default

The **show running-config** command without any arguments or keywords displays the entire contents of the running configuration file.

Command Modes

System Admin EXEC

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You can display either the entire running configuration, or a subset of the running configuration. The subset may be all the commands within a specified command mode.

Note In Cisco IOS XR software, the running configuration is automatically used at system startup, reset, or power cycle. The running configuration is the committed configuration.

Sanitized Output

Use the **show running-config** command with the **sanitized** keyword to display the contents of the active running configuration without installation-specific parameters. Some configuration details, such as IP addresses, are replaced with different addresses. The sanitized configuration can be used to share a configuration without exposing the configuration details.

Command Modes

When the **show running-config** command is entered in administration configuration mode, the configuration for the administration plane is displayed, including the configured logical routers for the system. When the **show running-config** command is entered in any global configuration mode, or in EXEC mode, the configuration for the specific secure domain router (SDR) is displayed.

The **inheritance** and **no-annotations** keywords are not supported in administration EXEC or configuration modes.

Excluding Parts of the Display

Use the **exclude** keyword followed by a *command* argument to exclude a specific configuration from the display.

Task ID

Task ID	Operations
config-services	read

This example shows how to enter the **show running-config** command with the question mark (?) online help function to display the available subsets of the running configuration that can be entered to display a subset of the running configuration:

```
RP/0/RP0/CPU0:router# show running-config ?

aaa                Authentication, Authorization and Accounting
alias              Create an alias for entity
aps                Configure SONET Automatic Protection Switching (APS)
arp                Global ARP configuration subcommands
as-path            BGP autonomous system path filter
as-path-set        Define an AS-path set
banner             Define a login banner
cdp                Enable CDP, or configure global CDP subcommands
cef                CEF configuration commands
cinetd             Global Cisco inetd configuration commands
class-map          Configure QoS Class-map command
clock              Configure time-of-day clock
community-list     Add a community list entry
community-set      Define a community set
controller         Controller configuration subcommands
dhcp               Dynamic Host Configuration Protocol
domain             Domain service related commands
exception          Coredump configuration commands
exclude            Exclude a feature or configuration item from display
explicit-path      Explicit-path config commands
extcommunity-set   Define an extended communitiy set
fault              Fault related commands
forward-protocol   Controls forwarding of physical and directed IP broadcasts
ftp                Global FTP configuration commands
--More--
```

This example shows sample output from the **show running-config** command with the **sanitized** keyword displays a sanitized version of the running configuration. The sanitized configuration can be used to share a configuration without exposing specific configuration details.

```
RP/0/RP0/CPU0:router# show running-config sanitized


Building configuration...

!! Last configuration change at 05:26:50 UTC Thu Jan 19 2009 by <removed>
!
snmp-server traps fabric plane
snmp-server traps fabric bundle state
```

```
hostname <removed>
line console
exec-timeout 0 0
!
exception choice 1 compress off filepath <removed>
logging console debugging
telnet vrf <removed> ipv4 server max-servers no-limit
snmp-server ifindex persist
snmp-server host 10.0.0.1 traps version <removed> priv <removed> udp-port 2555
snmp-server view <removed> <removed> included
snmp-server community <removed> RO LROwner
snmp-server community <removed> RO LROwner
snmp-server group <removed> v3 priv read <removed> write <removed>
snmp-server traps snmp
snmp-server traps syslog
interface Loopback10
!
interface Loopback1000
!
 --More--
```

Related Topics

show configuration (config), on page 116

service cli commit-optimized enable

To prevent the re-application of the commands which are already present in the running configuration of the router, use the **service cli commit-optimized enable** command in XR Config mode.

service cli commit-optimized enable

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 6.4.1	This command was introduced.

Usage Guidelines

None

Example

```
Router# configure
Router(config)# service cli commit-optimized enable
Router(config)# commit
```

template

To create a template name and enter template configuration mode, use the **template** command in global configuration mode. To remove a template definition, use the **no** form of this command.

template *name*
no template *name*

Syntax Description

name	Unique name for the template to be created.

Command Default

No templates are defined.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **template** command to enter template configuration mode. From template configuration mode, you can group a subset of configuration commands in a named template. Commonly used sets of configuration commands can be grouped into a named template. Defining a template is similar to creating a C macro function. A template provides modularity and ease of use during user configuration.

Use the **end-template** command to exit template configuration mode. After defining a template, use the **apply-template** command to apply the template. Use the **show running-config** command with the optional **template** keyword and *template-name* argument to display the contents of a template.

Task ID

Task ID	Operations
config-services	read, write

Related Topics

apply-template, on page 62
end-template, on page 76
show running-config, on page 138

File System Commands

This chapter describes the Cisco IOS XR software commands used to manage file systems on your router.

Note The commands in this module should not be used to access or modify any Cisco IOS XR software or configuration files. Use only the documented commands for installing and configuring the router. Modifying, deleting, or moving configuration or software package files using the manual commands described in this module is not required and can result in router downtime, loss of service, and a corrupted database.

- cd, on page 144
- cfs check, on page 145
- copy, on page 146
- delete, on page 151
- dir, on page 152
- mkdir, on page 154
- pwd, on page 155
- rmdir, on page 156
- show filesystem, on page 157
- show media, on page 159

cd

To change the current working directory, use **cd** command in XR EXEC mode.

cd *filesystem* **:**

Syntax Description

filesystem **:**	(Optional) Location of the new working directory. Include the file system alias for the *filesystem* argument, followed by a colon and optionally, the name of a directory.

Command Default

The default file directory is **disk0:/usr**.

Command Modes

XR EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

The current working directory is the directory used when EXEC commands that have an optional argument are entered without that argument. Use **cd** command to define the working directory. For example, when the **dir** command is entered without specifying the *filesystem* argument, the files in the current working directory are displayed.

Use **cd** command without an argument to set the working directory back to the default directory, **disk0:/usr**.

The following example shows how to change the current working directory to the root directory on the hard disk. In this example, the **pwd** command confirms that the working directory has changed to the root directory on the hard disk.

```
RP/0/RP0/CPU0:router# cd harddisk:
RP/0/RP0/CPU0:router# pwd

harddisk:
```

The following example shows how to change the current working directory to the default file directory by specifying the **cd** command without a location. In this example, the **pwd** command confirms that the working directory has changed to the default file directory.

```
RP/0/RP0/CPU0:router# cd
RP/0/RP0/CPU0:router# pwd

disk0:/usr
```

cfs check

To perform a check on the Configuration File System (CFS), use **cfs check** command in EXEC or administration XR EXEC mode.

cfs check

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Use this command to check the sanity of the configuration file system and attempt to recover from internal inconsistencies; one or more rollback points may be lost depending on the severity of the state of the file system.

Note While this command runs, redundancy of the is disabled.

The following example shows how to perform a CFS check:

```
RP/0/RP0/CPU0:router# cfs check

Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
Syncing commit database with running configuration...OK
Re-initializing cache files...OK
Updating Commit Database.  Please wait...[OK]
```

copy

To copy a file from a source (such as a network server) to a destination (such as a flash disk), use **copy** command in EXEC or Admin EXEC mode.

copy *source* {**location** *node-id* *destination* **location** {*node-id* | **all**} | **running-config**[**atomic**]}

Syntax Description

source	Filename including the directory path or network location of the file. The possible sources are: *directory-path* —Directory path of the file from which the file is copied. **access-list** { **ipv4**	**ipv6** }—Copies an access list (EXEC mode only). **disk0:** —Copies from disk0: file system. **disk1:** —Copies from disk1: file system. **ftp:** —Copies from an FTP network server. The syntax is **ftp:**[[[//*username* [:*password*]@] *location*]/*directory*]/*filename.* **harddisk:** —Copies from the hard disk drive file system (if present). **nvram:** —Copies from the NVRAM file system. **prefix-list** {**ipv4**	**ipv6**}—Copies from a prefix list (EXEC mode only). **running-config** —Copies from the current system configuration. **tftp:** —Copies from a TFTP network server. The syntax is **tftp:**[[//*location*]/*directory*]/*filename* **xml-schema** —Copies the XML schema files as a tar ball file (.tar.gz) [EXEC mode only].
destination	Filename including the directory path or network location of the file.
location *node-id*	Specifies a node. The *node-id* argument is expressed in the *rack*/*slot* notation.
location all	Copies to all nodes.
running-config	Applies the source configuration file to the running configuration of the system.
atomic	(Optional) Applies the changes to the running configuration only if there are no errors

Command Default

No default behavior or values

Command Modes

XR EXEC mode.

System Admin EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Source and destination can each be a configuration file, a text file, or a file system. Enter source and destination URL information, usernames, and passwords and issue the **copy** command. The networking device prompts for any missing information.

The exact format of the *source* and *destination* arguments vary according to the file or directory location. Enter the device or network location for the file system type.

Filenames can include the following characters:

! # $ % & ' + 0 1 2 3 4 5 6 7 8 9 ; @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [ ] ^ _ a b c d e f g h i j k l m n o p q r s t u v w x y z { } ~

The following characters can be used with the stated limitations:

- ` needs backslash before this character
- – cannot be the first character
- . cannot be the last character
- = cannot be the filename without other characters

The following characters cannot be used in filenames:

" ( ) * , / : < > ? \ |

To copy a file from a source on the router to a destination on the router, specify a source **location** *node-id* and a destination **location** *node-id* . To copy the file to all nodes, use the **location all** keywords.

In the alias syntax for the **ftp:** , **rcp:** , and **tftp:** keywords, the location is either an IP address or a hostname. The filename is specified relative to the directory used for file transfers.

When no alias is specified, the networking device looks for a file in the current directory. To view the current directory, enter the **pwd** command.

Note During processing of the **copy** command, you might see the “C” character. For all files being copied, “C” indicates that the copy process is taking place. The entire copying process might take several minutes and differs from protocol to protocol and from network to network.

Table 14: Network Protocols Supported by Cisco IOS XR Software

Prefix	Name	Description
tftp:	Trivial File Transfer Protocol	*TFTP* is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).
ftp:	File Transfer Protocol	*FTP* is an application protocol, part of the TCP/IP protocol stack, and is used for transferring files between network nodes. FTP requires a username and password.
rcp:	Remote Copy Protocol	The rcp protocol allows users to copy files to and from a file system residing on a remote host or server on the network. The rcp protocol uses TCP to ensure the reliable delivery of data. The rcp protocol downloads require a username.

Additional usage guidelines are in the following sections.

Invalid Combinations of Source and Destination

Some combinations of source and destination are invalid. Specifically, you cannot copy the following:

- From a running configuration to a running configuration
- From a network device to a network device (for example, **copy ftp: rcp:**)

Using TFTP

TFTP is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).

The syntax is as follows:

copy tftp://*hostname* /*ipaddress*/*directory-path pie name target-device* [**location** {*node-id* | **all**}]

Example:

```
RP/0/RP0/CPU0:router# copy tftp://1.1.1.1/images/software.pie disk1:
```

Note Some Cisco IOS XR images may be larger than 32 MB, and the TFTP services provided by some vendors may not support a file this large. If you do not have access to a TFTP server that supports files larger than 32 MB, download the software image using FTP or rcp as described in the following sections.

Using FTP

FTP servers require a username and password for each client request. Cisco IOS XR software sends the first valid username in the following list:

1. The username and password specified in the **copy** command, if a username is specified.

   The syntax is as follows:

   copy ftp:// *username* **:** *password* **@** *hostname or ipaddress*/*directory-path*/*pie-name target-device* [**location** {*node-id* | **all**}]

   Example:

   ```
   RP/0/RP0/CPU0:router# copy ftp://john:secret@10.1.1.1/images/software.pie disk1:
   ```

2. An “anonymous” username and password. The anonymous password is “root@ip address,” where “ip address” is the IP address of the local networking device.
3. A password “username@iosname.domain” formed by the networking device. The variable “username” is the username associated with the current session, “iosname” is the configured hostname, and “domain” is the domain of the networking device.

The username and password must be associated with an account on the FTP server. If you are writing to the network server, the FTP server must be properly configured to accept the FTP write request from the user on the networking device.

If the network server has a directory structure, the configuration file or image is written to or copied from the directory associated with the username on the network server. For example, if the system image resides in the home directory of a user on the network server, specify the name of that user as the remote username.

Refer to the documentation for your FTP server for more details.

Using rcp

The rcp protocol requires a username upon each request. When you copy a configuration file or image between the networking device and an rcp server, the Cisco IOS XR software sends the first valid username in the following list:

1. The remote username specified in the **copy** command, if one is specified.
2. The username set by the **rcp client username** command, if the command is configured.
3. The networking device hostname.

For the rcp copy request to process successfully, an account must be defined on the network server for the remote username. If the network administrator of the destination server did not establish an account for the remote username, this command does not run successfully. If the network server has a directory structure, the configuration file or image is written to or copied from the directory associated with the remote username on the network server. For example, if the system image resides in the home directory of a user on the network server, specify the name of that user as the remote username.

If you are writing to the network server, the rcp server must be properly configured to accept the rcp write request from the user on the networking device. For UNIX systems, add an entry to the .rhosts file for the remote user on the rcp server. Suppose the networking device contains the following configuration lines:

```
hostname Rtr1
ip rcp remote-username User0
```

If the IP address of the networking device translates to company.com, then the .rhosts file for User0 on the rcp server should contain the following line:

```
company.com Rtr1
```

See the documentation for your rcp server for more details.

If you are using a personal computer as a file server, the computer must support remote shell (rsh) protocol.

Using xml-schema

Use the **xml-schema** keyword to obtain the most up-to-date XML schemas (.xsd files) from the router. Using this keyword is useful to prevent the use of outdated schemas in the event that router software updates include schema updates. The tar ball file includes all active schema files. It does not include schemas that are activated by specific package installation envelopes (PIEs) if those PIEs are not installed and activated on the router.

Copying to the Running Configuration

When you use the **copy** command to copy a configuration file to the **running-config** destination, the configuration in the file is applied to the running configuration of the system. This is a configuration operation. By default, the copy is carried out in a best-effort manner. This means that if some configuration lines from the file cannot be applied, the remaining configuration is still integrated into the system. In this case, a partial

configuration is committed. When the **atomic** keyword is used, partial configurations are not committed. This means that even if one error occurs in the parsing or committing phase, no changes are made to the system. To view any errors when applying the configuration, use the **show configuration failed** command.

Task ID

Task ID	Operations
filesystem	execute

The following example shows how to copy a file from a FTP server to disk1:

```
RP/0/RP0/CPU0:router#
```

The following example shows how to copy a file from an rcp server to disk1:

```
RP/0/RP0/CPU0:router#
```

The following example shows how to copy a file from a TFTP server to disk1:

```
RP/0/RP0/CPU0:router#
```

delete

To delete files, use **delete** command in the appropriate mode.

delete*filename* [**disk0** | **disk1** | **harddisk**]

Syntax Description

filename	Filename of the file to be deleted.
disk0	Deletes disk0.
disk1	Deletes disk1.
harddisk	Deletes the harddisk

Command Default

A filename must be specified. If a filename is entered without a file system or directory path, the present working directory is used.

Command Modes

XR EXEC mode.

System Admin EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

When a file is deleted, it is removed from the system and cannot be restored (undeleted).

Use the **dir** command to display the list of files on a storage device.

The following example shows how to delete a file:

```
RP/0/RP0/CPU0:router# delete rbtest

Delete disk1:/rbtest[confirm]y
```

dir

To display a list of files on a file system or in a specific directory, use the **dir** command in XR EXEC mode System Admin EXEC mode.

dir [{/**all** | /**ena** | /**recurse**}] [*filesystem***:**] [*filename*] **location** {*node-id* | **all**}

Syntax Description

/all	(Optional) Lists deleted files, undeleted files, and files with errors.
/ena	(Optional) Recognizes subdirectories.
/recurse	(Optional) Recursively lists subdirectories.
filesystem **:**	(Optional) Name of the directory containing the files to be displayed. Include the file system alias for the *filesystem* argument, followed by a colon, and, optionally, the name of a directory.
filename	(Optional) Name of the files to display. The files can be of any type. You can use wildcards in the filename. A wildcard character (*) matches all patterns. Strings following a wildcard are ignored.
location {*node-id* | **all**}	(Optional) Specifies the node from which to display a list of files. The *node-id* argument is entered in the *rack/slot* notation. The **all** keyword specifies to display files on all nodes.

Command Default

When **dir** command is entered without keywords or arguments, the contents of the present working directory are displayed.

Command Modes

XR EXEC mode.

System Admin EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

If you enter the **dir** command without specifying a directory, the contents of the present working directory are displayed. The **all** keyword displays all files, including deleted files. The size associated with the directory name is the total size for all files in that directory.

The following example shows how to display the contents of a directory:

```
RP/0/RP0/CPU0:router# dir harddisk:/log

Directory of harddisk:/log

5527        drwx  4096        Thu Aug 28 11:21:48 2008  boot_28_Aug_2008_11_21_49
5533        drwx  4096        Thu Aug 28 11:38:54 2008  boot_28_Aug_2008_11_38_54
5538        drwx  4096        Fri Sep  5 13:28:54 2008  boot_05_Sep_2008_13_28_54
5543        drwx  4096        Mon Sep  8 08:55:52 2008  boot_08_Sep_2008_06_59_08
```

```
--More--
```

mkdir

To create a new directory on a file system, use the **mkdir** command in the appropriate mode.

mkdir *filesystem*:[**location** {*node-id* | **all**}]

Syntax Description

filesystem:	File system on which to create a new directory.
location {*node-id* | **all**}	(Optional) Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

After you issue the **mkdir** command, Cisco IOS XR software prompts you to specify the name of the directory to be created. When specifying the name of the new directory, include the directory path where you want the new directory to reside. If you do not specify a directory path, the new directory is created in the /usr directory of the file system specified for the *filesystem:* argument.

The following example shows how to create a directory named newdir. The **dir** command is used to verify that the directory has been added.

```
RP/0/RP0/CPU0:router# mkdir harddisk:

Create directory filename []?newdir
Created dir harddisk:/newdir
RP/0/RP0/CPU0:router# dir harddisk:

  Directory of harddisk:

  11193       drwx  4096        Fri Feb 13 06:45:05 2009  newdir
  37146       drwx  4096        Sun Dec 14 15:30:48 2008  malloc_dump
  43030       drwx  4096        Wed Dec 24 11:20:52 2008  tracebacks
  43035       drwx  4096        Thu Jan  8 18:59:18 2009  sau
  51026       drwx  4096        Sat Dec 27 02:52:46 2008  tempA
  51027       drwx  4096        Sat Dec 27 02:04:10 2008  dir.not.del
  -430307552  -rwx  342         Fri Jan 16 10:47:38 2009  running-config
  -430305504  -rwx  39790       Mon Jan 26 23:45:56 2009  cf.dat

  39929724928 bytes total (39883231232 bytes free)
```

pwd

To display the present working directory, use the **pwd** command in

System Admin EXEC

XR EXEC

.

pwd

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

XR EXEC

System Admin EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Use the **pwd** command to show what directory or file system is specified as the default by the **cd** command.

The following example shows how to display the present working directory:

```
RP/0/RP0/CPU0:router# pwd
disk0:/usr
```

rmdir

To remove an existing directory, use the **rmdir** command in the appropriate mode.

rmdir *filesystem*: **location** {*node-id* | **all**}

Syntax Description

filesystem	Name of the file system from which to delete a directory, followed by a colon.
location {*node-id* | **all**}	Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

XR EXEC

System Admin EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Use the **rmdir** command to remove directories (for example, to free up disk space) from a file system. After you issue the **rmdir** command, the Cisco IOS XR software prompts you to specify the name of the directory to be deleted.

When a directory contains files, you must remove the files before deleting the directory. Use the **delete** command to remove files.

The following example shows how to delete a subdirectory from the hard disk. The **dir** command is used to verify that the directory has been deleted.

```
RP/0/RP0/CPU0:router# rmdir harddisk:

Remove directory filename []?newdir
Delete harddisk:/newdir[confirm]y
RP/0/RP0/CPU0:router# dir harddisk:

  Directory of harddisk:

  37146       drwx  4096        Sun Dec 14 15:30:48 2008  malloc_dump
  43030       drwx  4096        Wed Dec 24 11:20:52 2008  tracebacks
  43035       drwx  4096        Thu Jan  8 18:59:18 2009  sau
  51026       drwx  4096        Sat Dec 27 02:52:46 2008  tempA
  51027       drwx  4096        Sat Dec 27 02:04:10 2008  dir.not.del
  -430307552  -rwx  342         Fri Jan 16 10:47:38 2009  running-config
  -430305504  -rwx  39790       Mon Jan 26 23:45:56 2009  cf.dat

  39929724928 bytes total (39883235328 bytes free)
```

show filesystem

To display the layout and contents of file systems, use the **show filesystem** command in XR EXEC mode

System Admin EXEC

XR EXEC

show filesystem *filesystem***:** [**location** {*node-id* | **all**}]

Syntax Description

filesystem:	Name of the file system for which to display information, followed by a colon. Possible values are: **disk0:**, **disk1:**, **harddisk:**.
location {*node-id* | **all**}	(Optional) Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

The file system for the active RP is displayed.

Command Modes

XR EXEC mode

XR EXEC

System Admin EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Use the **show filesystem** command to learn the alias names (prefixes) of the file systems supported by your networking device.

The following example shows sample output from the **show filesystem** command:

```
RP/0/RP0/CPU0:router# show filesystem

File Systems:

       Size(b)     Free(b)        Type  Flags  Prefixes
             -           -     network     rw  qsm/dev/fs/tftp: tftp:
             -           -     network     rw  qsm/dev/fs/rcp: rcp:
             -           -     network     rw  qsm/dev/fs/ftp: ftp:
   39929724928 39852978176    harddisk     rw  harddisk:
    1024606208   863584256  flash-disk     rw  disk0:
       2092032     2059264       nvram     rw  nvram:
      62390272    62381260       flash     rw  bootflash:
```

The following example shows sample output from the **show filesystem** command using the optional **location** *node-id* keyword and argument:

```
RP/0/RP0/CPU0:router# show filesystem location 0/rp0/cpu0

File Systems:
```

```
      Size(b)      Free(b)        Type  Flags  Prefixes
           -            -     network     rw  qsm/dev/fs/tftp: tftp:
           -            -     network     rw  qsm/dev/fs/rcp: rcp:
           -            -     network     rw  qsm/dev/fs/ftp: ftp:
 39929724928 39883235328    harddisk     rw  harddisk:
     2092032     2019328       nvram     rw  nvram:
  1024606208   847888384  flash-disk     rw  disk0:
    62390272    62153616       flash     rw  bootflash:
```

Table 15: show filesystem Field Descriptions

Field	Description
Size(b)	Amount of memory in the file system, in bytes.
Free(b)	Amount of free memory in the file system, in bytes.
Type	Type of file system.
Flags	Permissions for file system.
Prefixes	Alias for the file system.

show media

To display the current state of the disk storage media, use the **show media** command in System Admin EXEC mode.

show media location {*node-id* | **all**}

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

The disk storage media for the active RP is displayed.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Use the **show media** command to view the status of the storage media on your system.

The following example displays the output of the **show media** command:.

```
sysadmin-vm:0_RP0 #show media
Thu Nov 30 14:57:14.002 WET
Media Information for local node.
-----------------------------------------------
Partition                    Size     Used  Percent    Avail
rootfs:                      2.7G     1.5G      59%     1.1G
apphost:                     1.9G      61M       4%     1.7G
/dev/sde                     870M     401M      50%     409M
harddisk:                    2.4G     966M      43%     1.3G
log:                         459M      67M      16%     359M
config:                      159M     2.5M       2%     144M
disk0:                       1.3G     108M       9%     1.1G
-------------------------------------------------
rootfs: = root file system (read-only)
log: = system log files (read-only)
config: = configuration storage (read-only)
```

Table 16: show media Field Descriptions

Field	Description
Partition	Partition on the disk.
Size	Size of the partition.
Used	Partition size used.
Percent	Percentage used.
Avail	Available free partition space.

Hardware Redundancy and Node Administration Commands

This module describes the commands used to manage the hardware redundancy, power, and administrative status of the nodes on a router running Cisco IOS XR software.

- clear plugin slot counts, on page 163
- environment altitude, on page 164
- fabric enable mode, on page 165
- fpd auto-upgrade, on page 167
- fpd auto-reload, on page 168
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- hw-module cmp disable, on page 170
- hw-module external-usb disable, on page 171
- hw-module high-bandwidth, on page 172
- hw-module location port breakout, on page 173
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- hw-module location slice power-down , on page 179
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- show apm psa status, on page 190
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- show plugin slot counts, on page 217
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clear plugin slot counts

To clear the running counts of the backplane connector slot plugins, use the **clear plugin slot counts** command in administration EXEC mode.

clear plugin slot counts location *node-id*

Syntax Description

location *node-id*	Clears plugin slot counts on the designated node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear plugin slot counts** command can be used only if the revised backplane ID card (BPID-02) is installed. If the BPID-02 card is not installed, the following error message is displayed:

```
0/1/CPU0 slot counts 'current' ...Response error: 'ENVMON' detected the 'warning' condition
'Hardware not available'
```

Task ID

Task ID	Operation
sysmgr	execute

The following example illustrates how to use the **clear plugin slot counts** command:

```
RP/0/RSP0/CPU0:router(admin)# clear plugin slot counts location 0/FT1/SP

Fri Jan 15 10:15:55.388 pst

 0/FT1/SP slot counts 'current' ... cleared
RP/0/RSP0/CPU0:router(admin)# show plugin slot counts location 0/FT1/SP

Fri Jan 15 10:16:15.503 pst

Backplane connector slot plugin counters

                        Current         Cumulative
0/FT1/SP                0               14
```

environment altitude

To specify the chassis altitude, so the system can adjust the fan speed to compensate for lower cooling capability at higher altitudes, use the environment altitude command in administration configuration mode. To remove the altitude setting, use the no form of this command.

environment altitude *altitude* **rack** *rack-no*
no environment altitude *altitude* **rack** *rack-no*

Syntax Description

altitude	Chassis location altitude in meters. Values can range from 0 to 4000.
rack *rack-no*	Specifies the rack number of the chassis.

Command Default

1800 meters

Command Modes

Administration configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
root-system	read, write

This example specifies that the chassis is located at sea level:

```
RP/0/RP0/CPU0:router(admin-config)#environment altitude 0 rack 0
```

fabric enable mode

To change the fabric operation mode on Cisco ASR 9922 Series routers, use the **fabric enable mode** command in the System Admin Config mode.

fabric enable mode [highbandwidth | a99-highbandwidth]

Syntax Description

highbandwidth	Enables high scale Virtual Queuing Instance (VQI). In this mode, the maximum number of VQI that can be defined on the router is 2048. In the default mode, a maximum of 1024 VQI is supported and only first five switch fabric links can be used in each line card slot.
a99-highbandwidth	Enables the use of all seven switch fabric links in each line card slot. In this mode, the maximum number of VQI that can be defined on the router is 2048. **Note** This keyword is allowed only when all the line cards in the chassis are of A99 type (for example, A99-12X100GE, A99-8X100GE, and so on).

Command Default

In Cisco IOS XR, default operating mode is not configured (None).

In Cisco IOS XR 64 bit, default operating mode is **highbandwidth** .

Command Modes

System Admin Config mode.

Command History

Release	Modification
Release 6.1.2	a99-highbandwidth keyword support was introduced.
Release 5.3.0	This command was introduced.

Usage Guidelines

In Cisco IOS XR 64 bit, **highbandwidth** mode is enabled by default. Therefore, only **a99-highbandwidth** keyword can be used during command execution on Cisco IOS XR 64 bit routers.

Note Ensure to remove all the line cards that are unsupported for an operating mode before executing this command; the command will otherwise be rejected.

Note Remove all unsupported line cards in the chassis before enabling the **highbandwidth** operating mode. This mode is **NOT** available on the following line cards:

- A9K-2X100GE
- A9K-1X100GE
- A9K-36X10GE
- A9K-24X10GE
- A9K-MOD160
- A9K-MOD80
- A9K-16T
- A9K-8T
- A9K-4T
- A9K-2T20GE
- A9K-40GE
- A9K-SIP-700

Example:

This example shows the available fabric operating modes:

```
RP/0/RP0/CPU0:router (admin-config) # fabric enable mode ?
A99-highbandwidth  A99 High bandwidth cards only
highbandwidth      High bandwidth cards only
```

fpd auto-upgrade

To enable the automatic upgrade of FPD images during a software upgrade, use the **fpd auto-upgrade** command in System Admin Config mode. To disable automatic FPD upgrades, use the **no** form of this command.

fpd auto-upgrade

Syntax Description

This command has no keywords or arguments.

Command Default

FPD images are not automatically upgraded.

Command Modes

System Admin Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

By default automatic upgrades of the FPD images are not performed during a software upgrade. Once the **fpd auto-upgrade** command is enabled, when you upgrade the software and an FPD upgrade is required, the FPD upgrade is done automatically before the router is rebooted. The automatic FPD upgrade works only if the FPD image is upgraded together with the mini installation PIE. For example, use the **install add** and **install activate** commands as shown here:

```
(admin)# install add comp-hfr-mini.pie hfr-fpd.pie hfr-mpls-p.pie
(admin)# install activate disk0:/comp-hfr-mini.pie disk0:/hfr-fpd.piedisk0: hfr-mpls-p.pie
```

Task ID

Task ID	Operation
system	read, write

The following example shows how to enable automatic FPD upgrades:

```
RP/0/RP0/CPU0:router(admin-config)# fpd auto-upgrade
```

fpd auto-reload

To enable the automatic reload of a line card after successful FPD software upgrade, use the **fpd auto-reload** command in System Admin Config mode. To disable automatic LC reload, use the **no** form of this command.

fpd auto-reload

Syntax Description

This command has no keywords or arguments.

Command Default

None.

Command Modes

System Admin Config mode

Command History

Release	Modification
Release 6.5.1	This command was introduced.

Usage Guidelines

The **fpd auto-reload** command works only if **fpd auto-upgrade** command is configured.

```
(admin-config)#fpd auto-reload
(admin-config)#fpd auto-upgrade
(admin-config)#commit
```

This command is supported on Cisco IOS XR 32-bit OS.

Task ID

Task ID	Operation
system	read, write

The following example shows how to enable automatic LC reload after FPD upgrades:

```
RP/0/RP0/CPU0:router(admin-config)# fpd auto-reload
```

fpd auto-reload (Cisco IOS XR 64-bit)

To enable or disable automatic reload of a line card after successful FPD upgrade, use the **fpd auto-reload** command in XR Config mode.

fpd auto-reload{**enable** | **disable**}

Syntax Description

enable	Enables LC auto reload after FPD auto upgrade.
disable	Disables LC auto reload after FPD auto upgrade.

Command Default

None.

Command Modes

XR Config mode

Command History

Release	Modification
Release 6.5.1	This command was introduced.

Usage Guidelines

This command is supported on Cisco IOS XR 64-bit OS.

Task ID

Task ID	Operation
system	read, write

The following example shows how to enable automatic LC reload after successful FPD upgrades:

```
RP/0/RP0/CPU0:router(config)# fpd auto-reload enable
```

hw-module cmp disable

To disable the Console Management Port (CMP) on a RSP880/RP2, use the **hw-module cmp disable** command in Admin Configuration mode. Disabling unused CMP ensures a higher level of security.

To enable a CMP, use the **no** form of this command.

hw-module cmp disable
no hw-module cmp disable

Syntax Description

location *loc-name*	RSP880/RP2 location.

Command Default

CMP on a RSP880/RP2 is **enabled**.

Command Modes

Admin configuration

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

By default, CMP on a RSP880/RP2 is **enabled** and you can disable the port later by executing the command. If CMP is already disabled using this command, it will automatically be re-enabled when the RSP is re-loaded (at boot-up). However, after the RSP is in a stable state/UP state, the port gets disabled again as the configuration is automatically re-applied.

Note After CMP is disabled using this command, the CMP shell access session will be terminated.

This command can be executed only RSPs; not on Line Cards.

This example shows how to disable CMP on a RSP/RP:

```
RP/0/RP0/CPU0:router (admin-config) # hw-module cmp disable location 0/RSP0/CPU0
```

This example shows how to enable CMP on a RSP/RP:

```
RP/0/RP0/CPU0:router (admin-config) # no hw-module cmp disable location 0/RSP0/CPU0
```

hw-module external-usb disable

To disable USB ports on any RSP, use the **hw-module external-usb disable** command in Admin Configuration mode. Disabling unused USB ports ensures a higher level of security.

To enable a USB port, use the **no** form of this command.

On Cisco IOS XR 64 bit, use **external-usb disable** and **no external-usb disable** commands in Admin Configuration mode for the same.

hw-module external-usb disable
no hw-module external-usb disable

Syntax Description

This command has no keywords or arguments.

Command Default

USB port on a RSP is **enabled**.

Command Modes

Admin configuration

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

By default, USB port on a RSP is **enabled**. If USB is already inserted into a port and then the USB port is disabled using this command, the existing USB continues to be recognized until it is removed.

Note Inserting a USB will **not** be detected after a USB port is disabled using this command.

This command can be executed only RSPs; not on Line Cards.

This example shows how to disable a USB port on a RSP:

```
RP/0/RP0/CPU0:router (admin-config) # hw-module external-usb disable
```

This example shows how to enable a USB port on a RSP:

```
RP/0/RP0/CPU0:router (admin-config) # no hw-module external-usb disable
```

hw-module high-bandwidth

To upgrade the RSP3 Lite card from 80Gig per line card capacity to 220Gig per Line card capacity (for Enhanced ethernet linecards), use the **hw-module high-bandwidth** command in the appropriate mode. To restore the default capacity, use the **no** form of the command.

hw-module high-bandwidth
no hw-module high-bandwidth

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin config

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

This command can be used only after applying the appropriate license to RSPLite3. Traditional or smart licensing can be used.

Task ID

Task ID	Operation
sysmgr	execute

Example

This example shows how to use the **hw-module high-bandwidth** command:

```
RP/0/RP0/CPU0:router (config) # hw-module high-bandwidth
```

hw-module location port breakout

To convert the speed of a interface port from one to another, for example, 100G port to 40G port, use the **hw-module location** *node-id* **port** *port number***breakout** *interface* command in the global configuration mode.

hw-module location *node-id* **port** *number* **breakout** *interface*

Syntax Description

node-id	Node whose hardware attributes you want to configure. The *node-id* argument is expressed in the *rack/slot* notation. **Note** Enter the **show platform** command to see the location of all nodes installed in the router.
port *port-number*	Indicates the optics port number. Depending on the line card, the port numbers and its type might vary.
breakout *interface*	Configures the breakout interface.

Command Default

No default behavior or values

Command Modes

Global configuration mode

Command History

Release	Modification
Release 6.4.2	This command was introduced.
Release 7.1.3	This command was updated. The command is supported on two new hardware: • Cisco ASR 9000 12-Port 100GE line card (A99-12x100GE) • Cisco ASR 9000 4-Port 100GE line card (A9K-4x100GE)

Usage Guidelines

This command is supported only on these routers and line cards:

- Cisco ASR 9901 Routers
- Cisco ASR 9000 12-Port 100GE line card (A99-12x100GE)
- Cisco ASR 9000 4-Port 100GE line card (A9K-4x100GE)

Task ID

Task ID	Operations
root-system	read, write

Task ID	Operations
root-lr	read, write

This example shows how to convert 100G port to 40G port:

```
RP/0/RP0/CPU0:router(config)# hw-module location 0/0/CPU0 port 20 breakout 1xFortyGigE
```

hw-module location breakout

To configure the breakout option for a specified interface, use the **hw-module location breakout** command in the appropriate mode. To disable the breakout option, use the **no** form of the command.

hw-module location *node-id* [**preconfigure**] **bay** *bay-number* **port** *port-number* **breakout** *interface*

Syntax Description

location *node-id*	Interface details.
preconfigure	(Optional) Enables the user to preconfigure breakout on an empty slot.
bay *bay-number*	Bay number of the device (Upper, left, right, lower).
port *port-number*	Specifies the port on which you want to enable breakout.
breakout *interface*	Enables the breakout option. For information on supported port modes, see *System Management Configuration Guide for Cisco ASR 9000 Series Routers*.

Command Default

None

Command Modes

Global config

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SR10 CPAK can operate in the 10x10GE mode.

Use the **show ipv4 interfaces brief** command to get the details of the breakout interfaces:

```
show ipv4 interfaces brief | include Ten
TenGigE0/0/0/2/0              unassigned      Shutdown              Down
TenGigE0/0/0/2/1              unassigned      Shutdown              Down
TenGigE0/0/0/2/2              unassigned      Shutdown              Down
TenGigE0/0/0/2/3              unassigned      Shutdown              Down
TenGigE0/0/0/2/4              unassigned      Shutdown              Down
TenGigE0/0/0/2/5              unassigned      Shutdown              Down
TenGigE0/0/0/2/6              unassigned      Shutdown              Down
TenGigE0/0/0/2/7              unassigned      Shutdown              Down
TenGigE0/0/0/2/8              unassigned      Shutdown              Down
TenGigE0/0/0/2/9              unassigned      Shutdown              Down
```

Task ID

Task ID	Operation
sysmgr	read

Example

This example shows how to use the **hw-module location breakout** command:

```
RP/0/RP0/CPU0:router (config) # hw-module location 0/0/CPU0 bay 0 port 2 breakout 10xTenGigE
```

This example shows how to use the **hw-module location breakout** command to enable 1 GbE port mode option on port 10:

```
RP/0/RP0/CPU0:router (config) # hw-module location 0/0/CPU0 bay 0 port 10 breakout
5x1GE-5x10GE
```

hw-module location bay port port-mode

To configure an MPA with optics in 200G mode use the `hw-module location bay port port-mode` command in the global configurion mode.

Note Staircase FEC is supported only in 100gig mode.

hw-module location *location* **bay** *bay-number* **port** *port-number* **port-mode** *port-mode*

Syntax Description

location *location*	Indicates the location of the MPA, which is the line card ID.
bay *bay-number*	Indicates the bay number of the line card.
port *port-number*	Indicates the port number of the optical-module or optic. You can configure the port number with only the value, 0.
port-mode *port-mode*	Configures the 200G port mode. Port mode can be: • *2xHundredGigE-16QAM*: Configures 200G 16QAM port mode for EP • *2xHundredGigE-8QAM*: Configures 200G 8QAM port mode for EP A higher QAM value leads to higher data transmission rates, but also increases the risk of errors that necessitates re-sends.

Command Default

If this command is not configured, the MPA and optics work in 100G mode.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

You can configure this command only at port 0 of a router.

Task ID

Task ID	Operation
root-system	read, write
root-lr	read, write

This example shows how to configure 200G for an optical module of a router.

```
Router(config)# hw-module location 0/2/CPU0 bay 0 port 0 port-mode 2xHundredGigE-16QAM
```

hw-module location slice config-mode

To convert the speed of a interface port from one to another, for example, 10GE port to 1GE port, use the **hw-module location** *node-id* **slice** *number***config-mode** *interface* command in the global configuration mode.

hw-module location *node-id* **slice** *number* **config-mode** *interface*

Syntax Description

node-id	Node whose hardware attributes you want to configure. The *node-id* argument is expressed in the *rack/slot* notation. **Note** Enter the **show platform** command to see the location of all nodes installed in the router.

Command Default

No default behavior or values

Command Modes

Global configuration mode

Command History

Usage Guidelines

This command is supported on Cisco ASR 9902 router and on the following line cards:

- A9K-4HG-FLEX-SE/TR
- A99-4HG-FLEX-SE/TR
- A9K-4HG-FLEX-FC
- A99-4HG-FLEX-FC

The 5x1GE_5x10GE port mode enables 1GE support in the following ports:

- Slice 0: Ports 1, 3, 5, 7, 13, 15, 17, 19, 21, and 23
- Slice 1: Ports 25, 27, 29, 31, 33, 35, 41, 43, 45, and 47

Task ID

Task ID	Operations
root-system	read, write
root-lr	read, write

This example shows how to enable 5x1GE_5x10GE port mode:

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#hw-module location 0/0/CPU0 slice 0 config-mode config-mode
1x100GE,1x100GE,5x1GE_5x10GE,5x1GE_5x10GE
RP/0/RP0/CPU0:ios(config)#commit
```

hw-module location slice power-down

To power off a specified slice, use the **hw-module location slice power-down** command in the XR Config mode. To power on a slice, use the **no** form of the command.

hw-module location *node-id* **slice** *number* **power-down**

Syntax Description

location *node-id*	Specifies the line card node location.
slice *number*	Specifies the slice number that should be power off.

Command Default

All slices are power on.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This feature is supported on the Cisco ASR 9000 4th Generation Ethernet line cards.

Note It is necessary to reload the line card after executing the **hw-module location slice power-down** command.

Task ID

Task ID	Operation
sysmgr	read, write

Example

This example shows how to power down slice 3, and 7 of the line card at node 0:

```
RP/0/RP0/CPU0:router (config) # hw-module location 0/0/CPU0 slice 3 power-down
RP/0/RP0/CPU0:router (config) # hw-module location 0/0/CPU0 slice 7 power-down
RP/0/RP0/CPU0:router (config) # commit
RP/0/RP0/CPU0:router (config) # end
RP/0/RP0/CPU0:router # admin
RP/0/RP0/CPU0:router (sysadmin) # hw-module location 0/0/CPU0 reload
```

hw-module power saving

To configure the power saving mode for a specified slice, use the **hw-module power saving** command in the appropriate mode. To delete the power saving option, use the **no** form of the command.

hw-module power saving location *location* **slice** *number*
no hw-module power saving location *location* **slice** *number*

Syntax Description

location *location*	The interface details.
slice *number*	The slice number on which power save mode needs to be enabled. Each slice has two physical ports. Slice 1, 2 ,3 can be configured to the power saving mode. Power save option is not applicable for slice 0.

Command Default

None

Command Modes

Admin config

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Once a slice is configured in the power saving mode, the interfaces will be deleted and hence all traffic passing through the interfaces will be dropped.

Task ID

Task ID	Operation
sysmgr	read, write

Example

This example shows how to use the **hw-module power saving** command:

```
RP/0/RP0/CPU0:router (admin-config) # hw-module power saving location 0/1/cpu0 slice 3
```

hw-module profile feature

To enable a feature bundle on the router, use the **hw-module profile feature** command in administration configuration mode. To disable a feature bundle, use the **no** form of this command.

hw-module profile feature {**default** | **l2**}
no hw-module profile feature {**default** | **l2**}

Syntax Description

default	Feature profile that supports all features except provider backbone bridge (PBB).
l2	Feature profile that supports PBB, but does not support IPv6, reverse-path forwarding (RPF) and netflow.

Command Default

The default feature profile is **default**.

Command Modes

Administration configuration

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If you do not configure the feature profile, the default profile is active. The default feature profile does not support provider backbone bridge (PBB). If you need support for PBB, configure the L2 feature profile.

If you do not reload the line cards after configuring the feature profile, the configured profile is not active and this warning message is displayed. You must reload the affected line card so that the configured profile matches the active profile.

```
LC/0/1/CPU0:Nov 5 02:50:42.732 : prm_server[236]: Configured
'hw-module profile feature l2' does not match active 'hw-module
profile feature default'. You must reload this line card in order
to activate the configured profile on this card or you must change
the configured profile.
```

If you have configured features that are not supported in your active feature profile, this warning is displayed. You should either change the feature profile configuration, or remove the non-supported features.

```
LC/0/1/CPU0:Nov 5 02:50:42.732 : prm_server[236]: Active 'hw-module
profile feature l2' does not support IPv6, RPF, or Netflow
features. Please remove all unsupported feature configurations.
```

Task ID

Task ID	Operation
system	read, write

Task ID	Operation
root-lr	read, write

This example shows how to set the feature profile to L2:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
RP/0/RSP0/CPU0:router(admin-config)# hw-module profile
feature l2

Wed Dec  8 08:29:54.053 PST
L2 feature profile does NOT support the following features:
IPv6, RPF, Netflow.
In order to activate this new memory resource profile,
you must manually reboot the line cards.
RP/0/RSP0/CPU0:router(admin-config)# commit
```

hw-module profile scale

To specify a scale profile for the router, use the **hw-module profile scale** command in administration configuration mode.

hw-module profile scale {**default** | **l3** | **l3xl**}

Syntax Description

bng-max	This is an unused scale profile and will be deprecated in a future Cisco IOS XR software release.
default	Scale profile applicable for deployments that require large Layer 2 MAC tables (up to 512,000 entries) and a relatively small number of Layer 3 routes (less than 512,000).
l3	Scale profile applicable for deployments that require more Layer 3 routes (up to 1 million) and smaller Layer 2 MAC tables (less than 128,000 entries).
l3xl	Scale profile applicable for deployments that require a very large number of Layer 3 routes (up to 1.3 million) and minimal Layer 2 functionality.

Command Default

default is the default scale profile

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.9.1	This command was introduced.
Release 4.0.1	The **l3xl** keyword was introduced. This command was moved to administration configuration mode.
Release 5.1.1	The default scale profile for ASR 9000 Ethernet Line Cards was changed from **l2** to **l3**.
Release 5.1.2	**lsr** and **sat** keywords were introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **hw-module profile scale** command to configure the router to perform more efficiently depending on the use of the router.

- Specify the scale profile to be **default** in situations where the router is used as a Layer 2 transport device that requires the router to support high Layer 2 scale numbers.
- Specify the scale profile to be **l3xl** in situations where the router is used primarily as a Layer 3 box to provide Layer 3 VPN services. In this case, the router needs to support a high number of Layer 3 routes.

Note When you upgrade to a release that supports the **hw-module profile scale** command in administration configuration mode, the non-administration configured settings are retained and used. Once you configure the scale profile in the administration plane, it has higher priority than the non-administration plane, and it replaces the non-administration scale profile configuration.

Task ID

Task ID	Operation
system	read, write
root-lr	read, write

Example

The following example shows how to set the scale profile to Layer 3:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
RP/0/RSP0/CPU0:router(admin-config)# hw-module profile scale l3

Tue Aug 24 23:52:51.828 UTC
In order to activate this new memory resource profile,
you must manually reboot the system.
RP/0/RSP0/CPU0:router(admin-config)# commit
```

hw-module port-control license

To request (and apply) license for (A9K-4T16GE-TR and A9K-4T16GE-SE) combo card , use the **hw-module port-control license** command in the appropriate mode. To remove the applied license, use the **no** form of the command.

hw-module port-control license location *node-id*
no hw-module port-control license location *node-id*

Syntax Description

location *node-id*	Interface details.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

The **hw-module port-control license** command is used to apply the requested license on the combo card. The granted license is permanent , unless the user wants to remove license on this card and use it on some other card. LC reload is mandatory for the license to take effect. When the LC comes up after the reload, the licenses are installed and can be verified using the **show license entitlement** command.

If the user wants to use the combo license on some other line-card instead of the current one, then the license has to be removed. The **no hw-module port-control license** command removes the applied license.

Task ID

Task ID	Operation
sysmgr	execute

Example

This example shows how to use the **hw-module port-control license** command:

```
RP/0/RP0/CPU0:router (config) # hw-module port-control license location 0/1/CPU0
```

hw-module port-control non-combo-mode

To use all the four Tengig ports, instead of the Gigabit ethernet ports, use the **hw-module port-control non-combo-mode** command in the appropriate mode. To remove the non-combo configuration, use the **no** form of the command.

hw-module port-control non-combo-mode location *linecard-slot*
no hw-module port-control non-combo-mode location *linecard-slot*

Syntax Description

location *linecard-slot*	The interface and slot details.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

On the (A9K-4T16GE-TR and A9K-4T16GE-SE) combo card, the customer can either use 16Gigabit Ethernet + 2Tengig or 4Tengig ports. This option is when the customer does not have the Wildchild combo license. If the License is installed, all the ports will be enabled. In case, the license is not available and the customer wants to use all the 4 Tengig ports instead of the Gigabit ethernet ports, then , this command needs to be used. This is the non-combo mode.

Note LC reload is mandatory for the mode to take effect.

If the **hw-module port-control non-combo-mode** command is not configured, the line card will operate in the default mode. In the default mode, the two Tengig ports which are enabled are - 0/*/0/16 and 0/*/0/17.

Task ID

Task ID	Operation
sysmgr	execute

Example

This example shows how to use the **hw-module port-control non-combo-mode** command:

```
RP/0/RP0/CPU0:router (config) # hw-module port-control non-combo-mode location 0/1/CPU0
```

power budget enforcement n-plus-1 redundancy

To configure N+1 power redundancy protection mode on Cisco ASR 9910 Routers and Cisco ASR 9010 Routers (AC), use **power budget enforcement n-plus-1-redundancy** command in administration configuration mode. To remove configuration, use the **no** form of this command.

power budget enforcement n-plus-1-redundancy

Syntax Description

This command has no keywords or arguments.

Command Default

NA

Command Modes

Administration configuration

Command History

Release	Modification
Release 6.3.3	This command was introduced.

Usage Guidelines

Power on Cisco ASR 9000 Series Routers (ASR-9010-AC and ASR-9910-AC) was previously conserved based on the N+N power redundancy protection mode. The chassis had to be powered up in advance and for longer time than desired. The system will recalculate the power requirements based on the N+1 mode after this command is configured.

Note By default, the power requirements are calculated based on the N+N power redundancy mode when the router is powered on.

Note When the system is in N+1 power redundancy mode and a there is a switchover, the new Active RSP powers up with power calculations based on N+N power redundancy mode. After parsing this configuration, system recalculates the power requirements based on the N+1 power redundancy mode.

Note This configuration is only supported on AC power module varients of Cisco ASR 9910 Routers and Cisco ASR 9010 Routers.

The following example shows how to enable N+1 power redundancy protection mode:

```
RP/0/RP0/CPU0:router#admin
RP/0/RP0/CPU0:router(admin)#config
RP/0/RP0/CPU0:router(admin-config)#power budget enforcement n-plus-1-redundancy
```

redundancy switchover

To cause the primary (active) route processor (RP) to fail over to the redundant standby RP, use the **redundancy switchover** command in

XR EXEC

mode. To disable the forced switchover, use the **no** form of this command.

redundancy switchover [**location** *node-id*]
no redundancy switchover [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Specifies the primary RP on which to force a switchover. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **redundancy switchover** command to trigger a switchover from the primary RP to the standby RP. When the **redundancy switchover** command is issued, the running (committed) configuration is automatically saved and loaded during switchover, and the standby RP becomes the active primary RP, while the original primary RP becomes the standby RP.

Note The **redundancy switchover** command can be used only if the standby RP is in the ready state. Use the **show redundancy** command to view the status of the RPs.

Task ID

Task ID	Operations
root-lr	read, write

The following example shows partial output for a successful redundancy switchover operation:

```
RP/0/RP0/CPU0:router# show redundancy
```

```
  Redundancy information for node 0/RP0/CPU0:
  ==========================================
  Node 0/RP0/CPU0 is in ACTIVE role
  Partner node (0/RP1/CPU0) is in STANDBY role
  Standby node in 0/RP1/CPU0 is ready

  Reload and boot info
  ----------------------
  RP reloaded Tue Mar 28 09:02:26 2006: 5 hours, 41 minutes ago
  Active node booted Tue Mar 28 09:02:56 2006: 5 hours, 41 minutes ago
  Last switch-over Tue Mar 28 09:09:26 2006: 5 hours, 34 minutes ago
  Standby node boot Tue Mar 28 09:10:37 2006: 5 hours, 33 minutes ago
  Standby node last went not ready Tue Mar 28 09:25:49 2006: 5 hours, 18 minutes
  go
  Standby node last went ready Tue Mar 28 09:25:51 2006: 5 hours, 18 minutes ago
  There has been 1 switch-over since reload
  ....
RP/0/RP0/CPU0:router# redundancy switchover

  Initializing DDR SDRAM...found 2048 MB
  Initializing ECC on bank 0
  ...
  Turning off data cache, using DDR for first time

  Initializing NVRAM...
  Testing a portion of DDR SDRAM ...done
  Reading ID EEPROMs ...
  Initializing SQUID ...
  Initializing PCI ...

  PCI0 device[1]: Vendor ID 0x10ee

  Configuring MPPs ...
  Configuring PCMCIA slots ...
  --More--
```

If the standby RP is not in the ready state, the switchover operation is not allowed. The following example shows output for a failed redundancy switchover attempt:

```
RP/0/RP0/CPU0:router# show redundancy

  This node (0/RP0/CPU0) is in ACTIVE role
  Partner node (0/RP1/CPU0) is in UNKNOWN role

RP/0/RP0/CPU0:router# redundancy switchover

  Standby card not running; failover disallowed.
```

show apm psa status

To display the PSA status for APM, use the **show apm psa status** command in EXEC mode.

show apm psa status location *node-id*

Syntax Description

location *node-id*	The interface details.

Command Default

None

Command Modes

Admin EXEC

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
sysmgr	read

Example

This example shows how to use the **show apm psa status** command:

```
RP/0/RP0/CPU0:router (admin) # show apm psa status location 0/0/CPU0

0/0/CPU0

PSA Client Status
DIAG            ENVMON          INVMGR          FIA             PCIE            LDA  \
            PRM
Registered      Registered      Registered      Registered      Registered           \
Registered      Registered

PSA Slice Status
Slice   0: Power On     Completed     1: Power On     Completed     2: Power On      \
Completed     3: Power Saving Completed
DIAG       Completed                     Completed                     Completed     \
               Completed
ENVMON     Completed                     Completed                     Completed     \
               Completed
INVMGR     Completed                     Completed                     Completed     \
               Completed
FIA        Completed                     Completed                     Completed     \
               Completed
PCIE       Completed                     Completed                     Completed     \
               Completed
```

```
LDA         Completed                   Completed                   Completed     \
                  Completed
PRM         Completed                   Completed                   Completed     \
                  Completed
```

show apm psm status

To display the PSM status for APM, use the **show apm psm status** command in EXEC mode.

show apm psa status location *node-id*

Syntax Description

location *node-id*	The interface details.

Command Default

None

Command Modes

Admin EXEC

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
sysmgr	read

Example

This example shows how to use the **show apm psa status** command:

```
RP/0/RP0/CPU0:router (admin) #  show apm psm status location 0/0/CPU0
PSM Status
----------
PSM Client Status
        ENVMON:         Registered
        DIAG0:          Registered
        DIAG1:          Registered
        INVMGR:         Registered
        0/0/CPU0 PSA:   Registered

LC Status
---------
Line Card       Slice   Config  Status          ENVMON          DIAG0               \
DIAG1           INVMGR          PSA
0/0/CPU0        0       On      Completed       Completed       Completed           \
Completed       Completed       Completed
                1       On      Completed       Completed       Completed           \
Completed       Completed       Completed
                2       On      Completed       Completed       Completed           \
Completed       Completed       Completed
                3       Saving  Completed       Completed       Completed           \
Completed       Completed       Completed
```

show controllers pm ixdb

To display the platform manager output for Cisco ASR 9000 Series line cards, use the **show controllers pm ixdb** command in EXEC mode.

show controllers pm ixdb location [**location** {*node-id* | **all**}]

Syntax Description

ixdb	Displays the platform manager database utilization.
location {*node-id* | **all**}	Specifies the location of the node. The *node-id* argument is entered in the *rack/slot* notation. The **all** keyword specifies all nodes.

Command Default

None

Command Modes

EXEC

Command History

Command History

Release	Modification
Release 6.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show controllers pm ixdb** command displays the platform manager output equivalent to the PM shell command **pkg/bin/show_ixdb -f vkg_pmlib_ixdb -s** for Cisco ASR 9000 Series line cards.

Task ID

Task ID	Operations
sonet-sdh	read
dwdm	read
interface	read
drivers	read

The following example shows sample output from the **show controllers pm ixdb** command for the specified node location:

```
RP/0/RP0/CPU0:router# show controllers pm ixdb location 0/1/CPU0

Sun Oct  9 12:19:41.245 UTC

ixdb header Information:(0/1/CPU0)
==================================
ixdb version                = 1
ispec version               = 1
```

```
pathname                    = vkg_pmlib_ixdb
Hash collisions possible    = Yes
invalid_key                 = 0x0
hashsize                    = 163840
db_size                     = 81920
rec_size                    = 752
db_keys_offset              = 331776
hashtable_offset            = 987136
pool0_offset                = 1642520
db_offset                   = 3281056
start_alloc_index           = 12
alloc_index_tail            = 81919
serial                      = 1

========= DB Allocation ==========
last db alloc happened = 105 seconds ago

Number of allocated db records = 12,
Number of free db records = 81908,

========= Hash Table Datas =========
Used hash table entries = 12,
Unused hash table entries = 163828,
Collisions = 0,

========== Pools stats ===========
Pool0 linked list pool information
version = 0,    magic = 0xfeef1f00,
pool id/ serial = 0/0,
size in bytes  = 1638536,
Total entries = 81920,
Free entries = 81908,
next pool size = 0
```

The following example shows sample output from the **show controllers pm ixdb** command for all node locations:

```
RP/0/RP0/CPU0:router# show controllers pm ixdb location all
  Sun Oct  9 12:19:58.154 UTC

ixdb header Information:(0/1/CPU0)
==================================
ixdb version                = 1
ispec version               = 1
pathname                    = vkg_pmlib_ixdb
Hash collisions possible    = Yes
invalid_key                 = 0x0
hashsize                    = 163840
db_size                     = 81920
rec_size                    = 752
db_keys_offset              = 331776
hashtable_offset            = 987136
pool0_offset                = 1642520
db_offset                   = 3281056
start_alloc_index           = 12
alloc_index_tail            = 81919
serial                      = 1

========= DB Allocation ==========
last db alloc happened = 122 seconds ago

Number of allocated db records = 12,
```

```
Number of free db records = 81908,

========= Hash Table Datas =========
Used hash table entries = 12,
Unused hash table entries = 163828,
Collisions = 0,

========== Pools stats ===========
Pool0 linked list pool information
version = 0,    magic = 0xfeef1f00,
pool id/ serial = 0/0,
size in bytes  = 1638536,
Total entries = 81920,
Free entries = 81908,
next pool size = 0


ixdb header Information:(0/2/CPU0)
==================================
ixdb version                = 1
ispec version               = 1
pathname                    = vkg_pmlib_ixdb
Hash collisions possible    = Yes
invalid_key                 = 0x0
hashsize                    = 163840
db_size                     = 81920
rec_size                    = 752
db_keys_offset              = 331776
hashtable_offset            = 987136
pool0_offset                = 1642520
db_offset                   = 3281056
start_alloc_index           = 0
alloc_index_tail            = 81919
serial                      = 1

========= DB Allocation ==========
DB alloc never happened
Number of allocated db records = 0,
Number of free db records = 81920,

========= Hash Table Datas =========
Used hash table entries = 0,
Unused hash table entries = 163840,
Collisions = 0,

========== Pools stats ===========
Pool0 linked list pool information
version = 0,    magic = 0xfeef1f00,
pool id/ serial = 0/0,
size in bytes  = 1638536,
Total entries = 81920,
Free entries = 81920,
next pool size = 0
```

show environment

To display environmental monitor parameters for the system, use the **show environment** command in the appropriate mode.

SysAdmin EXEC Mode:
show environment {**all** | **current** | **fan** | **power** | **temperatures** | **trace** | **voltages**} **location** [*node-id*]

Syntax Description

current	Displays all the current information.
all	(Optional) Displays information for all environmental monitor parameters.
fans	(Optional) Displays information about the fans.
location {**all** | *node-id*}	(Optional) Displays all environmental monitor parameters for the specified location only.
power-supply	(Optional) Displays power supply voltage and current information.
temperatures	(Optional) Displays system temperature information.
trace	(Optional) Displays trace data for environment monitoring.
voltages	(Optional) Displays system voltage information.
node-id	(Optional) Node whose information you want to display. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

All environmental monitor parameters are displayed.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

The **show environment** command displays information about the hardware that is installed in the system, including fans, LEDs, power supply voltage, and current information and temperatures.

Task ID

Task ID	Operations
system	read

The following example shows sample output from the **show environment** command with the **temperatures** keyword:

```
RP/0/RP0/CPU0:router # show environemnt temperatures
Location  Sensor                       Value    Crit Major Minor Minor Major  Crit
                                      (deg C)    (Lo) (Lo)  (Lo)  (Hi)  (Hi)   (Hi)
================================================================================
0/5
          MB Inlet                      24     -10    -5     0     50    60     70
          HotSpot                       28     -10    -5     0     95   100    105
          MB Outlet                     24     -10    -5     0     95   100    105
          Sandy Bridge Die              38     -10    -5     0     75    85     95
          PCIe Die                      44     -10    -5     0    105   115    125
          Slice 1 PITA Die Remote       46     -10    -5     0    105   110    115
          Slice 1 AMBA Die local        35     -10    -5     0     95   100    105
          Slice 1 AMBA Die Remote       39     -10    -5     0    105   110    115
0/RP1
          Inlet                         21     -10    -5     0     45    55     65
          HotSpot                       32     -10    -5     0     65    75     85
          Outlet                        32     -10    -5     0     65    75     85
          PCIe Die                      36     -10    -5     0    105   115    125
          Chassis local                 22     -10    -5     0     45    55     65
          Chassis remote                22     -10    -5     0     45    55     65
          Sandy Bridge                  36     -10    -5     0     75    85     95
0/FC0
          Inlet                         30     -10    -5     0     50    60     75
```

Table 17: show environment temperatures Field Descriptions, on page 197 describes the significant fields shown in the display.

Table 17: show environment temperatures Field Descriptions

Field	Description
R/S/I	Rack number, slot number, and interface for which information is displayed, in the format *rack/slot*.
Modules	Module for which temperature information is displayed.
Inlet Temperature (deg C)	Current temperature of the inlet sensor, in degrees Celsius. **Note** The inlet temperature corresponds to the room air temperature entering the router.
Exhaust Temperature (deg C)	Current temperature of the exhaust sensor, in degrees Celsius. **Note** The exhaust temperature corresponds to the air being exhausted from the router.

Field	Description
Hotspot Temperature (deg C)	Current temperature of the hotspot, in degrees Celsius.

Table 18: show environment leds Field Descriptions, on page 198describes the significant fields shown in the display.

Table 18: show environment leds Field Descriptions

Field	Description
rack_num/*slot_num*/*:	Rack number and slot number where the node resides.
Module (host) LED status says:	Current LED status of the specified node.

The following example shows sample output from the **show environment** command the with the **power-supply** keyword:

```
RP/0/RP0/CPU0:router # show environment power
CHASSIS LEVEL POWER INFO: chassisinfo
================================================================================
   Total output power capacity (Shelf 0 + Shelf 1) :       0W +   12000W
   Total output power required                     :    6500W
   Total power input                               :    1341W
   Total power output                              :     964W

Power Shelf 0:
================================================================================
   Power       Supply     ------Input----   ------Output---      Status
   Module      Type        Volts     Amps    Volts     Amps
================================================================================
   0/PT1-PM0   3KW-AC      213.5      1.5     55.5      4.1    OK
   0/PT1-PM1   3KW-AC      212.9      1.6     55.4      4.4    OK
   0/PT1-PM2   3KW-AC      212.9      1.6     55.4      4.5    OK
   0/PT1-PM3   3KW-AC      212.0      1.6     55.4      4.4    OK
   0/PT1-PM4      -          0.0      0.0      0.0      0.0    NOT PRESENT
   0/PT1-PM5      -          0.0      0.0      0.0      0.0    NOT PRESENT

Total of Power Shelf 0:        1341W/ 6.3A        964W/17.4A
```

This table describes the significant fields shown in the display.

Table 19: show environment power-supply Field Descriptions

Field	Description
R/S/I	Rack number, slot number, and interface for which information is displayed, in the format PEM/Power Module/* (for example 0/PM0/*).
Modules	Module for which power information is displayed.
Capacity	Power capacity of each power module in Watts.
Status	Operational status of power modules.
Power Draw	Real (measured) power drawn from each power module.
Voltage	Real (measured) power module voltage.

Field	Description
Current	Real (measured) power module current draw.
Power Shelves Type	AC or DC.
Total Power Capacity	Sum of the power capacity of each of the modules installed in the chassis.
Usable Power Capacity	Sum of the power capacity of each of the powered and operational power modules installed in the chassis.
Supply Failure Protected Capacity	Protected power capacity of the chassis with power module redundancy (ASR 9010 AC 3+3, ASR 9010 DC 5+1, ASR 9006 AC 2+1, ASR 9010 DC 2+1).
Feed Failure Protected Capacity	Feed protected power capacity. This value applies to the ASR 9010 AC system only.
Worst Case Power Used	Sum of the estimated power draw of each of the load modules in the chassis. Load modules can be fan trays, RSPs and line cards.
Worst Case Power Available	Usable power capacity minus the worst case power used.
Supply Protected Capacity Available	Supply failure protected capacity minus the worst case power used.
Feed Protected Capacity Available	Feed failure protected capacity minus the worst case power used.
Power Budget Enforcement	This field displays the Power Budget Enforcement status as Enabled or Disabled.
Power Budget Mode	This field displays the power redundancy mode used (for example, N+1).
N+1 Supply Failure Protected Capacity	This field represents the Supply Protected Power capacity of the chassis with power module redundancy in N+1 mode.

show hw-module profile

To display the active profiles on the router, use the **show hw-module profile** command in EXEC mode.

Syntax Description

feature	Displays information regarding active feature profiles.
location *node-id*	Displays the active profile for a particular node.

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.1	The **feature** keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show hw-module profile** command displays only active profiles. If a profile has been configured and the line card has not be reloaded since the configuration, the profile is not active. Use the **show running-config hw-module profile** command to view configured profiles.

Task ID

Task ID	Operation
root-lr	read

This example shows sample output from the **show hw-module profiles** command with the **feature** keyword:

```
RP/0/RSP0/CPU0router0# show hw-module profile feature

Thu Dec  9 03:30:42.633 PST

                Node: 0/0/CPU0:
----------------------------------------------------------------

Memory Resources for All NPs
----------------------------
Feature Profile: Default

                Node: 0/1/CPU0:
----------------------------------------------------------------

Memory Resources for All NPs
----------------------------
Feature Profile: Default

                Node: 0/4/CPU0:
----------------------------------------------------------------

Memory Resources for All NPs
----------------------------
```

```
Feature Profile: Default

                Node: 0/6/CPU0:
----------------------------------------------------------------

Memory Resources for All NPs
----------------------------
Feature Profile: Default
```

Related Commands

Command	Description
hw-module profile feature, on page 181	Enables a feature bundle on the router.

show inventory

To retrieve and display information about all the Cisco products that are installed in the router, use the **show inventory** command in System Admin EXEC or XR EXEC mode.

System Admin EXEC Mode
show inventory [{**all** | **chassis** | **fan** | **location** {*node-id*} | **power** | **raw**}]
XR EXEC Mode
show inventory [{*locationspecifier* | **all** | **location** {*locationspecifier* | **all**} | **oid** | **raw**}]

Syntax Description

all	(Optional) Displays inventory information for all the physical entities in the chassis.
location {*node-id*}	(Optional) Displays inventory information for a specific node, or for all nodes in the chassis.
raw	(Optional) Displays raw information about the chassis for diagnostic purposes.
chassis	(Optional) Displays inventory information for the entire chassis.
locationspecifier	(Optional) Displays the name of the location.
oid	(Optional) Displays OID information about the chassis.
fan	(Optional) Displays inventory information for the fans.
power	(Optional) Displays inventory information for the power supply.

Command Default

All inventory information for the entire chassis is displayed.

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

Enter the **show inventory** command with the **raw** keyword to display every RFC 2737 entity installed in the router, including those without a PID, unique device identifier (UDI), or other physical identification.

If any of the Cisco products do not have an assigned PID, the output displays incorrect PIDs, and version ID (VID) and serial number (SN) elements may be missing.

For UDI compliance products, the PID, VID, and SN are stored in EEPROM. Use the **show inventory** command to display this information.

Task ID

Task ID	Operations
sysmgr	read

The following example shows partial sample output from the **show inventory** command with the **raw** keyword:

```
sysadmin-vm:0_RP0# show inventory raw

Tue Aug  27 13:32:31.730 UTC

 Name: Rack 0-Chassis        Descr: NCS 6008-8-Slot Chassis
 PID: N/A                    VID: N/A                    SN: N/A

 Name: Rack 0-LineCard Chassis backplane  Descr: NCS 6008-8-Slot Chassis Backplane
 PID: N/A                    VID: N/A                    SN: N/A

 Name: Rack 0-MidPlane IDPROM  Descr: NCS 6008-8-Slot Chassis
 PID: NCS-6008        VID: V01                   SN: SAD12345678

 Name: Rack 0-Line Card Slot 0  Descr: NCS 6008-8-Slot Line Card Slot
 PID: N/A                    VID: N/A                    SN: N/A

 Name: 0/0-Card              Descr: NCS 6000 10x100G Multi-Service CXP P0
 PID: N/A                    VID: N/A                    SN: N/A

 Name: 0/0-Motherboard       Descr: Motherboard Module
 PID: N/A                    VID: N/A                    SN: N/A
--More--
```

Table 20: show inventory Field Descriptions, on page 203 describes the significant fields shown in the display.

Table 20: show inventory Field Descriptions

Field	Description
NAME	Hardware for which the inventory information is displayed. If you are displaying the chassis inventory, this field shows "chassis." If you are displaying raw inventory, or all inventory information for all nodes in the chassis, this field shows the node name in partially qualified format. For a node, the NAME is expressed in *rack/slot* notation.
DESCR	Describes the chassis or the node. Chassis descriptions provide the name of the chassis and its Gbps. Node descriptions provide the type of node and its software version.
PID	Physical model name of the chassis or node.
VID	Physical hardware revision of the chassis or node.
SN	Physical serial number for the chassis or node.

show led

To display LED information for the router, or for a specific LED location, use the **show led** command in System Admin EXEC mode.

show led [{**location** [*node-id*] | **trace** {**all***trace-name*} **location** *node-id* [{**all***trace-attributes*}]}]

Syntax Description

location *node-id*	Specifies the node for which to display LED information. The *node-id* argument is entered in the *rack/slot* notation.
trace	Displays LED debug traces information.
trace-name	Trace name.
location *node-id*	Specifies the target location. The *node-id* argument is expressed in the *rack/slot* notation.
trace-attribute	Trace attribute.
all	Displays all the details.

Command Default

If no node is specified, information about all LEDs on the router is displayed.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Enter the **show platform** command to see the location of all nodes installed in the router.

Task ID

Task ID	Operations
system	read

The following example sample output from the **show led** command with the keyword:

```
sysadmin-vm:0_RP0# show led
Tue Aug  27 13:44:33.770 UTC
============================================================
Location  LED Name                      Mode          Color
============================================================
0/0
          0/0-Attention LED             WORKING     OFF
          0/0-Status LED                WORKING     GREEN
0/1
          0/1-Attention LED              -           -
          0/1-Status LED                 -           -
```

```
0/RP0
          0/RP0-Attention LED           WORKING     OFF
          0/RP0-Status LED              WORKING     GREEN
          0/RP0-Alarm Minor LED         WORKING     AMBER
          0/RP0-Alarm Major LED         WORKING     AMBER
          0/RP0-Alarm Critical LED      WORKING     OFF
0/RP1
          0/RP1-Attention LED           WORKING     OFF
          0/RP1-Status LED              WORKING     GREEN
          0/RP1-Alarm Minor LED         WORKING     AMBER
          0/RP1-Alarm Major LED         WORKING     AMBER
          0/RP1-Alarm Critical LED      WORKING     OFF
0/FC0
          0/FC0-Attention LED           WORKING     OFF
```

Table 21: show led location Field Descriptions

Field	Description
LOCATION	Location of the node. LOCATION is expressed in the *rack/slot* notation.
LED Name	Name of the LED.
MODE	Current operating mode of the specified node.
COLOR	Color of the LED.

show operational

To display all operational data provided as XML schema, use the **show operational** command in

XR EXEC

mode.

show operational *mda-class*[*mda-class*][*mda-class/naming=value*][**descriptive**]

Syntax Description

mda-class	Name of the management data API (MDA) class to output. To specify a class name in hierarchy, all classes must be specified from the top of the class to the specific class name that you are interested in. MDA classes are case-sensitive. To view all available MDA classes, use the question mark (**?**) online help function.
descriptive	Displays more descriptive information.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Although the **show operational** command uses the schema database, the command displays the information in a string format like the other **show** commands. No XML related setups or knowledge is required to use the command.

Task ID

Task ID	Operations
Depends on the MDA class for which you are displaying the information	read

The following example shows sample output from the **show operational** command. Not all the output is shown.

```
RP/0/RP0/CPU0:router# show operational BGP DefaultVRF GlobalProcessInfo descriptive
[BGP DefaultVRF GlobalProcessInfo]
InStandaloneMode: true[Standalone or Distributed mode]
RouterID: 0.0.0.0[Router ID for the local system]
ConfiguredRouterID: 0.0.0.0[Configured router ID]
LocalAS: 10[Local autonomous system #]
RestartCount: 1[No of times BGP has started]
ISRedistributeIBGPToIGPsEnabled: false[Redistribute iBGP into IGPs enabled]
IsFastExternalFalloverEnabled: true[Fast external fallover enabled]
IsBestpathMissingMEDIsWorstEnabled: false[Bestpath: Treat missing MED as worst]
```

```
.
.
.
DefaultLocalPreference: 100[Default local preference]
KeepAliveTime: 60[Default keepalive timer (seconds)]
HoldTime: 180[Default hold timer (seconds)]
GenericScanPeriod: 60[Period (in seconds) of generic scanner runs]
.
.
.
VrfIsActive: true[VRF state ]
VrfName: "default"[Name of the VRF ]
```

This example shows sample output from the **show operational** command where only the top-level MDA class is specified. Not all of the output is shown.

```
RP/0/RP0/CPU0:router# show operational Inventory

Thu Feb 19 00:54:41.251 PST
[Inventory]
RackTable
  Rack/Number=0
    SlotTable
      Slot/Number=0
        CardTable
          Card/Number=0
            PortSlotTable
              PortSlot/Number=0
                Port
                  BasicAttributes
                    BasicInfo
                      Description: CPU_PORT_0
                      VendorType: 1.3.6.1.4.1.9.12.3.1.10
                      Name: 0/0/SP/0
                      IsFieldReplaceableUnit: false
                      CompositeClassCode: 983040
                BasicAttributes
                  BasicInfo
                    Description: CE Port Slot
                    VendorType: 1.3.6.1.4.1.9.12.3.1.5.115
                    Name: portslot 0/0/SP/0
                    IsFieldReplaceableUnit: false
                    CompositeClassCode: 0
            SensorTable
              Sensor/Number=0
                BasicAttributes
                  BasicInfo
                    Description: Temperature Sensor
                    VendorType: 1.3.6.1.4.1.9.12.3.1.8.42
                    Name: 0/0/* - host - Inlet0
                    CompositeClassCode: 720898
                    EnvironmentalMonitorPath: /admin/oper/inventory/
                     rack/0/entity/0/entity/0/entity/0/entity/0/attrib/
              Sensor/Number=1
                BasicAttributes
                  BasicInfo
                    Description: Temperature Sensor
                    VendorType: 1.3.6.1.4.1.9.12.3.1.8.42
                    Name: 0/0/* - host - Inlet1
                    CompositeClassCode: 720898
                    EnvironmentalMonitorPath: /admin/oper/inventory/
                     rack/0/entity/0/entity/0/entity/0/entity/1/attrib/
```

```
                Sensor/Number=2
                  BasicAttributes
                    BasicInfo
                      Description: Temperature Sensor
                      VendorType: 1.3.6.1.4.1.9.12.3.1.8.42
                      Name: 0/0/* - host - Exhaust0
                      CompositeClassCode: 720898
--More--
```

show platform

To display information and status for each node in the system, use the **show platform** command in System Admin EXEC or XR EXEC mode.

System Admin EXEC Mode
show platform [{**detail** | **slices**}] [**location** [*node-id*]]
XR EXEC Mode
show platform

Syntax Description

detail	Displays details of node type and state.
slices	Displays summary of node forwarding slices.
location *node-id*	Specifies the target node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

Status and information are displayed for all nodes in the system.

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 5.2.3	The output for the **detail** keyword captures card failure events and the reason for failure when **show platform** command is run in System Admin EXEC mode.

Usage Guidelines

The **show platform** command provides a summary of the nodes in the system, including node type and status.

For NCS 6008, EP1 will be displayed as, **Not allowed online**, until the required license is bought.

Task ID

The following example shows sample output from the **show platform** command:

```
sysadmin-vm:0_RP0#show platform
Wed Aug  28 06:49:49.822 UTC
Location  Card Type                HW State      SW State      Config State
------------------------------------------------------------------------------
0/RP0     NC6-RP                   OPERATIONAL   OPERATIONAL   NSHUT
0/RP1     NC6-RP                   OPERATIONAL   OPERATIONAL   NSHUT
0/FC0     NC6-FC                   OPERATIONAL   N/A           NSHUT
0/FT0     P-L-FANTRAY              OPERATIONAL   N/A           NSHUT
0/FT1     P-L-FANTRAY              OPERATIONAL   N/A           NSHUT
0/3       NC6-10X100G-M            OPERATIONAL   OPERATIONAL   NSHUT
0/PT1     NCS-AC-PWRTRAY           OPERATIONAL   N/A           NSHUT
```

show power allotted

To display the power allotted to the cards in the chassis, use the **show power allotted** command in administration EXEC mode.

show power allotted {**location** *node-id* | **rack** *rack-no* | **summary**}

Syntax Description

location *node-id*	Displays the power consumption for the specified location. The node-id argument is entered in the *rack/slot* notation.
rack *rack-no*	Displays the power consumption for the specified rack.
summary	Displays summary information for all racks.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The display for modular power supplies is by card. The display for fixed power supplies is by zone and card.

Task ID

Task ID	Operation
power	read

This example shows sample output from the **show power allocated** command on a modular power supply:

```
RP/0/RP0/CPU0:router(admin)# show power allotted location 0/0/*

Sun Nov 18 22:00:51.176 UTC
nodeid = 0x2a00000f
Node              Card Type         State             PID               Power Allotted
----------------- ----------------- ----------------- ----------------- -----------------
0/0/*             FP-140G           POWERED UP        CRS-MSC-FP140       450.0W
0/0/PL0           14-10GbE          POWERED UP        14X10GBE-WL-XF      150.0W
```

This example shows sample output from the **show power allotted** command on a fixed power supply:

```
RP/0/RP0/CPU0:router(admin)# show power allotted rack 0
```

```
Tue Nov 20 18:51:56.404 OST
Zone              Node              Card Type         State             PID
Power Allotted
----------------- ----------------- ----------------- ----------------- -----------------
-----------------
Zone 1:
                  0/FAN-TR0         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W
                  0/FAN-TR1         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W


Zone 2:
                  0/RP0/*           UNKNOWN           N/A
   175.0W
                  0/RP1/*           RP(H)-X86v1       N/A               CRS-8-PRP-6G
   175.0W
                  0/SM0/*           UNKNOWN           N/A
   185.0W
                  0/SM1/*           FC-140G/S(H)      N/A               CRS-8-FC140/S
   185.0W
                  0/SM2/*           UNKNOWN           N/A
   185.0W
                  0/SM3/*           FC-140G/S(H)      N/A               CRS-8-FC140/S
   185.0W


Zone 3:
                  0/6/*             MSC-B             POWERED UP        CRS-MSC-B
   390.0W
                  0/6/PL0           JACKET CARD       POWERED UP
   150.0W
                  0/7/*             MSC-140G          UNPOWERED
     7.0W
                  0/FAN-TR0         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W
                  0/FAN-TR1         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W
```

show power capacity

To display the power capacity of the router, use the **show power capacity** command in administration EXEC mode.

show power capacity {**rack** *rack-no* | **summary**}

Syntax Description

rack *rack-no*	Displays the power capacity for the specified rack.
summary	Displays summary power capacity for the chassis.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The display for modular power supplies is by card. The display for fixed power supplies is by zone and card.

Task ID

Task ID	Operation
power	read

This example shows sample output from the **show power capacity** command on a modular power supply:

```
RP/0/RP0/CPU0:router(admin)# show power capacity rack 0

Sun Nov 18 22:02:11.394 UTC
-------------------------------------------------------
Rack 0: Cisco CRS Series AC Power System
-------------------------------------------------------
Power Module      State                Power Capacity
----------------- ----------------- ---------------------
0                  OK                1900.0W
1                  OK                1900.0W
2                  OK                1900.0W
3                  OK                1900.0W
-------------------------------------------------------
Total Rack Power Capacity:           7600.0W
```

This example shows sample output from the **show power capacity** command on a fixed power supply:

```
RP/0/RP0/CPU0:router(admin)# show power capacity rack 0

Sun Dec  9 02:40:09.464 PST
--------------------------------------------------------------------------------
Rack 0: Cisco CRS Fixed AC Power System
--------------------------------------------------------------------------------
Zone              Power Module      State             Zone Power Capacity
----------------- ----------------- ----------------- --------------------
 Zone 1:           A[0]               OK                 1460.0W

                   B[0]               OK
 Zone 2:           A[0]               OK                 1460.0W

                   B[0]               OK
 Zone 3:           A[0]               OK                 1460.0W

                   B[0]               OK
--------------------------------------------------------------------------------
Total Rack Power Capacity:                               4380.0W
```

show power summary

To display a summary of the power information for a rack, use the **show power** command in administration EXEC mode.

show power summary rack *rack-no*

Syntax Description

rack *rack-no*	Displays summary output for the specified rack

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The display for modular power supplies is by card. The display for fixed power supplies is by zone and card.

Task ID

Task ID	Operation
power	read

This example shows sample output from the **show power summary** command on a modular power supply.

```
RP/0/RP0/CPU0:router(admin)# show power summary rack 0

Sun Nov 18 22:02:40.434 UTC
Location          Power Capacity    Power Allotted    Power Available
----------------- ----------------- ----------------- ------------------
Rack :  0            7600.0W           1285.0W            6315.0W
```

This example shows sample output from the **show power summary** command on a fixed power supply.

```
RP/0/RP0/CPU0:router(admin)# show power summary rack 0

Wed Nov 14 00:29:06.354 PST
Location          Power Capacity    Power Allotted    Power Available
----------------- ----------------- ----------------- ------------------
Rack 0:

Zone 1:             1460.0W             650.0W             810.0W
Zone 2:             1460.0W            1534.0W             -74.0W
```

```
Zone 3:              1460.0W              650.0W              810.0W
```

show platform slices

To display the status of the slices for an interface, use the **show platform slices** command in the EXEC mode.

show platform slices [**location***node-id*]

Syntax Description

location	*node-id*	Interface details.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.3.0	

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **hw-module power saving** to power-off / on any of the slices (Slice 0 cannot be powered-off).

Task ID

Task ID	Operation
sysmgr	read

Example

This example shows how to use the **show platform slices** command:

```
RP/0/RP0/CPU0:router # sh plat slices
show_slice nodeid 0x0

Line Card       Slice   Config          Status
0/0/CPU0        0       Power on        Completed
                1       Power on        Completed
                2       Power on        Completed
                3       Power saving    Completed
```

show plugin slot counts

To display cumulative and running counts of card inserts per slot, use the **show plugin slot counts** command in administration EXEC mode.

show plugin slot counts location {**all***node-id*}

Syntax Description

location {**all** *node-id*}	Displays plugin slot counts on the designated node or all nodes. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show plugin slot counts** command to display the number of insertions that have been made to the router backplane for a specific line card or RSP. This command can be used only if the BPID-02 card is installed. If the BPID-02 card is not installed, the following error message is displayed:

```
Response error: 'ENVMON' detected the 'warning' condition 'Hardware not available'
```

Task ID

Task ID	Operation
sysmgr	read

Example

This example illustrates sample output from the **show plugin slot counts** command:

```
RP/0/RSP0/CPU0:router(admin)# show plugin slot counts location all

Tue Oct  6 13:37:15.706 pst

Backplane connector slot plugin counters

             Current         Cumulative
0/0/CPU0         176                176
0/1/CPU0          11                 11
0/2/CPU0           0                  0
0/3/CPU0           0                  0
0/RSP0/CPU0        0                  0
0/RSP1/CPU0        1                  1
```

```
0/4/CPU0            9                   9
0/5/CPU0            0                   0
0/6/CPU0           12                  12
0/7/CPU0            0                   0
0/FT0/SP            4                   4
0/FT1/SP           14                  14
```

Related Commands

Command	Description
clear plugin slot counts	Clears the running counts of the backplane connector slot plugins.
show canbus	

show redundancy

To display the status of route processor redundancy, use the **show redundancy** command in

XR EXEC

mode.

show redundancy [{**location** {*node-id* | **all**} | **statistics** | **summary**}]

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies the node for which to display LED information. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.
statistics	(Optional) Displays redundancy statistics information.
summary	(Optional) Displays a summary of all redundant node pairs in the router.

Command Default

Route processor redundancy information is displayed for all nodes in the system.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show redundancy** command to display the redundancy status of the . The **show redundancy** command also displays the boot and switchover history for the . To view the nonstop routing (NSR) status of the standby in the system, use the **summary** keyword.

Task ID

Task ID	Operations
system	read
basic-services	read (for **statistics** keyword)

```
RP/0/RP0/CPU0:router# show redundancy location 0/rp0/cpu0

Node 0/RP0/CPU0 is in ACTIVE role
Partner node (0/RP1/CPU0) is in STANDBY role
Standby node in 0/RP1/CPU0 is ready
Standby node in 0/RP1/CPU0 is NSR-ready
```

```
Reload and boot info
----------------------
RP reloaded Mon Jul 30 19:27:42 2007: 2 weeks, 1 day, 13 hours,
40 minutes ago
Active node booted Mon Jul 30 19:27:42 2007: 2 weeks, 1 day,
13 hours, 40 minutes ago
Standby node boot Mon Jul 30 19:28:13 2007: 2 weeks, 1 day,
13 hours, 39 minutes ago
Standby node last went not ready Mon Jul 30 20:27:00 2007:
2 weeks, 1 day, 12 hours, 41 minutes ago
Standby node last went ready Mon Jul 30 20:27:00 2007: 2 weeks,
1 day, 12 hours, 41 minutes ago
There have been 0 switch-overs since reload
```

Manageability Commands

This chapter describes the Cisco IOS XR software commands used to enable the HTTP server, enable router management through Extensible Markup Language (XML) agent services, and support the Common Object Request Broker Architecture (CORBA) infrastructure.

The XML Parser Infrastructure provides parsing and generation of XML documents with Document Object Model (DOM), Simple API for XML (SAX), and Document Type Definition (DTD) validation capabilities:

- DOM allows customers to programmatically create, manipulate, and generate XML documents.
- SAX supports user-defined functions for XML tags.
- DTD allows for validation of defined document types.

- ipv4 disable, on page 222
- ipv6 enable (XML), on page 223
- iteration, on page 224
- streaming, on page 226
- session timeout, on page 227
- show xml schema, on page 229
- show xml sessions, on page 231
- shutdown (VRF), on page 233
- streaming, on page 235
- throttle, on page 236
- vrf (XML), on page 237
- xml agent, on page 239
- xml agent ssl, on page 240
- xml agent tty, on page 241

ipv4 disable

To disable IPv4 XML transport, use the **ipv4 disable** command in XML agent configuration mode. To enable IPv4 XML transport, use the **no** form of this command.

ipv4 disable
no ipv4 disable

Syntax Description

This command has no keywords or arguments.

Command Default

IPv4 XML transport is enabled by default.

Command Modes

XML agent configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to disable IPv4 XML transport:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent) ipv4 disable
```

Related Topics

ipv6 enable (XML), on page 223

ipv6 enable (XML)

To enable IPv6 XML transport, use the **ipv6 enable** command in XML agent configuration mode. To disable IPv6 XML transport, use the **no** form of this command.

ipv6 enable
no ipv6 enable

Syntax Description

This command has no keywords or arguments.

Command Default

IPv6 XML transport is disabled by default.

Command Modes

XML agent configuration

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to enable IPv6 XML transport:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent) ipv6 enable
```

Related Topics

ipv4 disable, on page 222

iteration

To configure the iteration size for large XML agent responses, use the iteration command in xml agent configuration mode. To revert to the default iteration settings, use the **no** form of this command.

iteration {**off** | **on** **size** *iteration-size*}
no iteration

Syntax Description

off	Disables iteration, meaning that the entire XML response is returned, regardless of its size. Use of this option is not recommended.
on	Enables iteration, meaning that large XML responses are broken into chunks according to the iteration chunk size.
size *iteration-size*	Specifies the size of the iteration chunk, in Kbytes. Values can range from 1 to 100,000.

Command Default

Iteration is enabled; the *iteration-size* is 48.

Command Modes

XML agent

TTY XML agent

SSL XML agent

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the XML agent returns a large response, it splits the response into chunks and returns one chunk at a time. External clients then need to send a GetNext request to obtain the next chunk. Use the **iteration** command to control the size of iteration chunks. A larger chunk value allows larger chunks to be received in a shorter period of time, possibly making the router system busier. A smaller chunk value allows smaller chunks to be received over a longer period of time, but does not make the router busy You can also specify to disable iteration completely using the **iteration off** command.

Note It is not recommended to disable iteration, since this could result in large transient memory usage.

To specify the TTY or SSL iteration size specifically, use the **iteration** command from the appropriate command mode.

Task ID

Task ID	Operations
config-services	read, write

Example

The following example shows how to configure the iteration chunk size to 100 Kbytes.

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# iteration on size 100
```

The following example shows how to disable iteration:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# iteration off
```

The following example shows how to turn on iteration with the default iteration size:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# no iteration off
```

The following example shows how to change the iteration size to the default iteration size.

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# no iteration on size 100
```

The following example shows how to change the iteration size of the TTY agent to 3 Kbytes:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
RP/0/RP0/CPU0:router(config-xml-tty)# iteration on size 3
```

The following example shows how to turn off the iteration of the SSL agent:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
RP/0/RP0/CPU0:router(config-xml-ssl)# iteration off
```

Related Topics

xml agent, on page 239
xml agent ssl, on page 240
xml agent tty, on page 241

streaming

To configure the streaming size of the response while the XML agent is retrieving data from the source, use the **streaming** command in the appropriate mode.

streaming on **size** *size in kbytes*

Syntax Description

size *size in kbytes*	Streaming size of the xml response. Range is 1 to 100000.

Command Default

Default is 48 KB.

Command Modes

XML agent mode

Command History

Release	Modification
Release 4.1	This command was introduced.

Usage Guidelines

Iteration must be off. The sub-response block size is a configurable value specific to each transport mechanisms on the router (the XML agent for the dedicated TCP connection and Secure Shell (SSH), Telnet, or Secure Sockets Layer (SSL) dedicated TCP connection).

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to configure the streaming size to 100 KB:

```
RP/0/RP0/CPU0:router (config) # xml agent
RP/0/RP0/CPU0:router (config-xml) # streaming on size 100
```

session timeout

To configure an idle timeout for the XML agent, use the **session timeout** command in xml agent configuration mode. To remove the session timeout, use the **no** form of this command.

session timeout *timeout*

Syntax Description

timeout	Amount of idle time in minutes that must pass before the XML agent closes the session. Values can range from 1 to 1440.

Command Default

There is no session timeout.

Command Modes

xml agent

xml agent ssl

xml agent tty

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

The following example illustrates how to configure the dedicated agent to close the session after 5 minutes of idle time:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# session timeout 5
```

The following example illustrates how to configure the XML TTY agent to close the session after 60 minutes of idle time:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
RP/0/RP0/CPU0:router(config-xml-agent-tty)# session timeout 60
```

The following example illustrates how to configure the XML TTY agent to have no timeout (the default):

```
RP/0/RP0/CPU0:router(config)# xml agent tty
```

```
RP/0/RP0/CPU0:router(config-xml-agent)# no session timeout
```

Related Topics

xml agent, on page 239

show xml schema

To browse the XML schema and data, use the **show xml schema** command in

XR EXEC

mode.

show xml schema

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show xml schema** command runs the XML schema browser so that you can browse the XML schema and data.

Task ID

Task ID	Operations
config-services	read

This example shows how to enter the XML schema browser and the available commands:

```
RP/0/RP0/CPU0:router# show xml schema

Username: xxxx
Password:
Enter 'help' or '?' for help
xml-schema[config]:> ?

config            oper              action
adminoper         adminaction       cd
pwd               classinfo         list
ls                datalist          walk
walkdata          get               hierarchy
quit              exit              help
xml-schema[config]:>
```

Related Topics

copy

show xml sessions

To display the status of an Extensible Markup Language (XML) session, use the **show xml sessions** command in

XR EXEC

mode.

show xml sessions [{**default** | **ssl** | **tty**}] [**detail**]

Syntax Description

default	Displays the status of the default XML agent.
ssl	Displays the status of the XML agents over secure socket layer (SSL).
tty	Displays the status of XML agents over telnet.
detail	Displays details regarding the XML sessions.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read

Example

This example illustrates sample output of the **show xml sessions** command with no optional keywords specified:

```
RP/0/RP0/CPU0:router# show xml sessions

Session  Client                 Agent    User  Date                     State
00000001 192.168.10.85 (default) tty      cisco Fri Jun 19 22:42:29 2009 idle
10000001 10.12.24.15 (VRF1)      default  lab   Fri Jun 19 22:32:12 2009 busy
```

This example illustrates sample output of the **show xml sessions** command with the **tty** keyword:

```
RP/0/RP0/CPU0:router# show xml sessions tty
```

```
Session  Client                  Agent User  Date                     State
00000001 192.168.10.85 (default) tty   cisco Fri Jun 19 22:42:29 2009 idle
00000002 10.12.24.15 (VRF1)      tty   lab   Fri Jun 19 22:32:12 2009 busy
```

This example illustrates sample output of the **show xml sessions** command with the **detail** keyword:

```
RP/0/RP0/CPU0:router#
show xml sessions detail


Session: 00000001
  Client:                 192.168.10.85 (default)
  Agent type:             tty
  User:                   cisco
  State:                  idle
  Config session:         -
  Alarm notification:     Registered
  Start Date:             Tue Aug 24 18:21:29 2010
  Elapsed Time:           00:00:27
  Last State Changed:     00:00:27
Session: 10000001
  Client:                 10.12.24.15 (VRF1)
  Agent type:             default
  User:                   lab
  State:                  busy
  Config session:         00000010-0005b105-00000000
  Alarm notification:     Not registered
  Start date:             Tue Aug 24 18:21:29 2010
  Elapsed Time:           00:01:10
  Last State Changed:     00:01:10
```

Related Topics

xml agent, on page 239

shutdown (VRF)

To configure the dedicated XML agent to not receive or send messages via the default VRF, use the **shutdown** command in xml agent vrf configuration mode. To enable the dedicated XML agent to receive or send messages via the default VRF, use the **no** form of this command.

shutdown
no shutdown

This command has no keywords or arguments.

Command Default

The default VRF instance is enabled by default.

Command Modes

xml agent vrf configuration

xml agent ssl vrf configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

Example

The following example illustrates how to configure the XML dedicated agent to send and receive messages via VRF1 only:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-vrf)# shutdown
```

The following example illustrates how to configure the XML SSL agent to send and receive messages via VRF1 only:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
RP/0/RP0/CPU0:router(config-xml-agent-ssl)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent-ssl)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-ssl-vrf)# shutdown
```

The following example illustrates how to enable the default VRF after it has been disabled:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-vrf)# no shutdown
```

Related Topics

vrf (XML), on page 237

streaming

To configure XML response streaming, use the **streaming** command in one of the XML agent configuration modes. To disable XML response streaming, use the **no** form of this command.

streaming on size *size*

Syntax Description

on	Turns on XML streaming.
size *size*	Specifies the size of the stream in Kbytes.

Command Default

XML streaming is disabled.

Command Modes

XML agent

XML agent ssl

XML agent tty

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to set the XML response streaming size to 5000 Kbytes.

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# streaming on size 5000
```

throttle

To configure the XML agent processing capabilities, use the **throttle** command in XML agent configuration mode.

throttle {**memory** *size* | **process-rate** *tags*}

Syntax Description

memory	Specifies the XML agent memory size.
size	Maximum memory usage of XML agent per session in MB. Values can range from 100 to 600. The default is 300.
process-rate	Specifies the XML agent processing rate.
tags	Number of tags that the XML agent can process per second. Values can range from 1000 to 30000.

Command Default

The process rate is not throttled; memory size is 300 MB.

Command Modes

XML agent configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **throttle** command to control CPU time used by the XML agent when it handles large data.

Task ID

Task ID	Operation
config-services	read, write

Example

This example illustrates how to configure the number of tags that the XML agent can process to 1000:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# throttle process-rate 1000
```

vrf (XML)

To configure a dedicated agent to receive and send messages via the specified VPN routing and forwarding (VRF) instance, use the vrf command in one of the xml agent configuration mode. To disable the receiving and sending of messages via a specific VRF instance, use the **no** form of this command.

vrf {**default***vrf-name*}

Syntax Description

default	Configures the default VRF instance.
vrf-name	Configures the specified VRF instance.

Command Default

The default VRF is enabled by default.

Command Modes

XML agent configuration

XML agent SSL configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The default VRF is enabled by default. To disable the default VRF, use the **shutdown** command.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to configure the dedicated XML agent to receive and send messages via VRF1, VRF2 and the default VRF:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF2
```

This example shows how to remove access to VRF2 from the dedicated agent:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# no vrf VRF2
```

Related Topics

shutdown (VRF), on page 233
xml agent, on page 239
xml agent ssl, on page 240

xml agent

To enable Extensible Markup Language (XML) requests over a dedicated TCP connection and enter XML agent configuration mode, use the **xml agent** command in

XR Config

mode. To disable XML requests over the dedicated TCP connection, use the **no** form of this command.

Note This command enables a new, enhanced-performance XML agent. The **xml agent tty** command enables the legacy XML agent and is supported for backward compatibility.

xml agent
no xml agent

Command Default

XML requests are disabled.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

There are two XML agents: a legacy XML agent and an enhanced-performance XML agent. We recommend that you use the enhanced-performance agent. The legacy agent is supported for backward compatibility. Use the **xml agent** command to enable the enhanced-performance XML agent. Use the **xml agent tty** command to enable the legacy XML agent.

Use the **no** form of the **xml agent** command to disable the enhanced-performance XML agent.

Task ID

Task ID	Operations
config-services	read, write

This example shows how to enable XML requests over a dedicated TCP connection:

```
RP/0/RP0/CPU0:router(config)# xml agent
```

xml agent ssl

To enable Extensible Markup Language (XML) requests over Secure Socket Layer (SSL) and enter SSL XML agent configuration mode, use the **xml agent ssl** command in

XR Config

mode. To disable XML requests over SSL, use the **no** form of this command.

xml agent ssl
no xml agent ssl

Command Default

SSL agent is disabled by default.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The k9sec package is required to use the SSL agent. The configuration is rejected during commit when the security software package is not active on the system. When the security software package is deactivated after configuring SSL agent, the following syslog message is displayed to report that the SSL agent is no longer available.

```
xml_dedicated_ssl_agent[420]:
%MGBL-XML_TTY-7-SSLINIT : K9sec pie is not active, XML service over
SSL is not available.
```

Task ID

Task ID	Operations
config-services	read, write

This example shows how to enable XML requests over SSL:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
```

xml agent tty

To enable Extensible Markup Language (XML) requests over Secure Shell (SSH) and Telnet and enter TTY XML agent configuration mode, use the **xml agent tty** command in

XR Config

mode. To disable XML requests over SSH and Telnet, use the **no** form of this command.

Note This command enables a legacy XML agent that has been superceded by an enhanced performance XML agent and is supported only for backward compatibility. To enable the enhanced-performance XML agent, use the **xml agent** command.

xml agent tty
no xml agent tty

Command Default

XML requests over SSH and Telnet are disabled.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

There are two XML agents: a legacy XML agent and an enhanced-performance XML agent. We recommend that you use the enhanced-performance agent. The legacy agent is supported for backward compatibility. The **xml agent tty** command enables the legacy XML agent. Use the **xml agent** command to enable the enhanced-performance XML agent.

Use the **no** form of the **xml agent tty** command to disable the legacy XML agent.

Task ID

Task ID	Operations
config-services	read, write

This example shows how to enable XML requests over Secure Shell (SSH) and Telnet:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
```

Network Time Protocol (NTP) Commands

This chapter describes the Cisco IOS XR Network Time Protocol (NTP) commands used to perform basic network time management tasks, including synchronizing time settings and coordinating time distribution over the network.

When an NTP server or client is configured, NTP features are available on all router interfaces. NTP features can be disabled for any specified interface, local or remote, to the route processor (RP).

For detailed information about NTP concepts, configuration tasks, and examples, see the *Implementing NTP on Cisco IOS XR Software* configuration module in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

- access-group (NTP), on page 244
- authenticate (NTP), on page 246
- authentication-key (NTP), on page 248
- broadcast, on page 250
- broadcast client, on page 252
- broadcastdelay, on page 254
- interface (NTP), on page 255
- master, on page 257
- master primary-reference-clock, on page 259
- max-associations, on page 261
- multicast client, on page 262
- multicast destination, on page 263
- ntp, on page 264
- ntp clear, on page 266
- ntp passive, on page 267
- ntp reset drift, on page 268
- peer (NTP), on page 270
- server (NTP), on page 273
- show calendar, on page 275
- show ntp associations, on page 276
- show ntp status, on page 277
- source (NTP), on page 279
- trusted-key, on page 281
- update-calendar, on page 283

access-group (NTP)

To control access to Network Time Protocol (NTP) services for an IPv4 or IPv6 access list, use the **access-group** command in one of the NTP configuration modes. To remove the **access-group** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

access-group [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] {**peer** | **query-only** | **serve** | **serve-only**} *access-list-name*
no access-group [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] {**peer** | **query-only** | **serve** | **serve-only**}

Syntax Description

vrf *vrf-name*	(Optional) Applies the access control configuration to a specified nondefault VRF. If not specified, the configuration is applied to the default VRF.
ipv4	(Optional) Specifies an IPv4 access list (default).
ipv6	(Optional) Specifies an IPv6 access list.
peer	Allows time requests and NTP control queries and allows a networking device to synchronize to the remote system.
query-only	Allows only NTP control queries. Cisco IOS XR software uses NTP Version 4, but the RFC for Version 3 (RFC 1305: *Network Time Protocol (Version 3)—Specification, Implementation and Analysis*) still applies.
serve	Allows time requests and NTP control queries, but does not allow the networking device to synchronize to the remote system.
serve-only	Allows only time requests.
access-list-name	Name of an IPv4 or IPv6 access list.

Command Default

No NTP access control is configured.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The access group options are scanned in the following order from least restrictive to most restrictive:

1. **peer**—Allows time requests and NTP control queries and allows the router to synchronize itself to a system whose address passes the access list criteria.

2. **serve**—Allows time requests and NTP control queries, but does not allow the router to synchronize itself to a system whose address passes the access list criteria.
3. **serve-only**—Allows only time requests from a system whose address passes the access list criteria.
4. **query-only**—Allows only NTP control queries from a system whose address passes the access list criteria.

Access is granted for the first match that is found. If no access groups are specified, all access is granted to all sources. If any access groups are specified, only the specified access is granted. This facility provides minimal security for the time services of the system. However, it can be circumvented by a determined programmer. If tighter security is desired, use the NTP authentication facility.

If you use the **access-group** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to allow itself to be synchronized by a peer from an IPv4 access list named access1 and to restrict access to allow only time requests from an IPv4 access list named access2:

```
RP/0/RP0/CPU0:router(config-ntp)# access-group peer access1
RP/0/RP0/CPU0:router(config-ntp)# access-group serve-only access2
```

The following example shows how to configure the router to allow itself to be synchronized by peers from the IPv6 access list named access20 that route through the vrf10 VRF:

```
RP/0/RP0/CPU0:router(config-ntp)# access-group vrf vrf10 ipv6 peer access20
```

Related Commands

Command	Description
ipv4 access-list	Defines an IPv4 access list by name.
ipv6 access-list	Defines an IPv6 access list by name.
vrf	Configures a VRF instance for a routing protocol.

authenticate (NTP)

To enable Network Time Protocol (NTP) authentication, use the **authenticate** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

authenticate
no authenticate

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP authentication is configured.

From Release 6.4.1 onwards, NTP authentication is enabled by default.

Command Modes

NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

From Release 6.4.1 onwards, the behaviour of **authenticate** has changed. This feature is enabled by default to prevent an exploitable condition when **passive**, **broadcast client** or **multicast client** is configured.

If the system has been configured with the **broadcast client** or **multicast client** command in NTP configuration mode, and when the system receives an incoming symmetric active NTP packet, or if the system receives a broadcast or multicast mode NTP packet, it can set up an ephemeral peer association in order to synchronize with the sender. The system will then synchronize to the peer when a symmetric active, broadcast, or multicast NTP packet is received and the packet carries one of the authentication keys specified in the **trusted-key** command.

Even though NTP authentication is enabled by default, it does not force the authentication of peer associations that are created using the **server** and **peer** commands in NTP configuration mode. It only enforces authentication when remote systems attempt to create new ephemeral associations.

Use the **no authenticate** command to allow synchronizing with unauthenticated and unconfigured network peers.

Prior to Release 6.4.1, the behavior of this command is as follows:

Use the **authenticate** command to prevent the system from synchronizing with unauthenticated and unconfigured network peers.

If the **authenticate** command is specified, and when a symmetric active, broadcast, or multicast NTP packet is received, the system will not synchronize to the peer unless the packet carries one of the authentication keys specified in the **trusted-key** command.

You must enable **authenticate** when enabling **broadcast client** or **multicast client** command in NTP configuration mode unless you have other measures (such as using the **access-group** command in NTP configuration mode) to prevent unauthorized hosts from communicating with the NTP service on the device.

The **authenticate** command does not ensure authentication of peer associations that are created using the **server** and **peer** commands in NTP configuration mode. When creating associations using the **server** and **peer** commands in NTP configuration mode, specify the **key** keyword to ensure the authentication of packets that move to and from the remote peer.

Use the **no authenticate** command to allow synchronizing with unauthenticated and unconfigured network peers.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to a system that provides an authentication key 42 in its NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

Related Topics

authentication-key (NTP), on page 248
trusted-key, on page 281

authentication-key (NTP)

To define an authentication key for a trusted Network Time Protocol (NTP) time source, use the **authentication-key** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

authentication-key *key-number* **md5** [{**clear** | **encrypted**}] *key-name*
no authentication-key *key-number*

Syntax Description

key-number	Authentication key. A number in the range from 1 to 65535.
md5	Provides message authentication support using the Message Digest 5 (MD5) algorithm.
clear	(Optional) Specifies that the key value entered after this keyword is unencrypted.
encrypted	(Optional) Specifies that the key value entered after this keyword is encrypted.
key-name	Key value. The maximum length is 32 characters.

Command Default

No authentication key is defined for NTP.

Command Modes

NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **authentication-key** command to define authentication keys for use with trusted NTP time sources.

Note When this command is written to NVRAM, the key is encrypted so that it is not displayed when the configuration is displayed.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to systems providing authentication key 42 in their NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

Related Topics

authenticate (NTP), on page 246
peer (NTP), on page 270
server (NTP), on page 273
trusted-key, on page 281

broadcast

To create a Network Time Protocol (NTP) broadcast server on a specified NTP interface, use the **broadcast** command in NTP interface configuration mode. To remove the command from the configuration file and restore the system to its default condition, use the **no** form of this command.

broadcast [**destination** *ip-address*] [**key** *key-id*] [**version** *number*]
no broadcast [**destination** *ip-address*] [**key** *key-id*] [**version** *number*]

Syntax Description

destination *ip-address*	(Optional) Specifies the host IPv4 address.
key *key-id*	(Optional) Defines the authentication key, where *key-id* is the authentication key to use when sending packets to this peer. The key identified by the *key-id* value is also used for packets received from the peer.
version *number*	(Optional) Specifies a number from 1 to 4, indicating the NTP version.

Command Default

No NTP broadcast servers are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcast** command to create an NTP broadcast server on an NTP interface to send NTP broadcast packets.

Use the **broadcast client** command to set a specific interface to receive NTP broadcast packets.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure interface 0/0/0/1 to send NTP packets to destination host IP address 10.0.0.0:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface tengige 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast destination 10.0.0.0
```

Related Topics

broadcast client, on page 252
broadcastdelay, on page 254

broadcast client

To allow a networking device to receive Network Time Protocol (NTP) broadcast packets on an interface, use the **broadcast client** command in NTP interface configuration mode. To remove the configuration and restore the system to its default condition, use the **no** form of this command.

broadcast client
no broadcast client

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP broadcast clients are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcast client** command to configure and create an NTP broadcast client and to associate the client with an interface to receive and handle NTP broadcast packets. If no NTP client has been created for an interface, the received NTP broadcast packets are dropped. Use this command to allow the system to listen to broadcast packets on an interface-by-interface basis.

To prevent synchronization with unauthorized systems, whenever this command is specified, authentication must be enabled using the **authenticate (NTP)** command or access must be restricted to authorized systems using the **access-group (NTP)** command. See the documentation of the respective commands for more information.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure interface 0/0/0/1 to send NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp interface tengige 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast client
```

Related Topics

broadcast, on page 250

broadcastdelay, on page 254

broadcastdelay

To set the estimated round-trip delay between a Network Time Protocol (NTP) client and an NTP broadcast server, use the **broadcastdelay** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

broadcastdelay *microseconds*
no broadcastdelay *microseconds*

Syntax Description

microseconds	Estimated round-trip time for NTP broadcasts, in microseconds. The range is from 1 to 999999. The default is 3000.

Command Default

microseconds: 3000

Command Modes

NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcastdelay** command to change the default round-trip delay time on a networking device that is configured as a broadcast client.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to set the estimated round-trip delay between a networking device and the broadcast client to 5000 microseconds:

```
RP/0/RP0/CPU0:router(config-ntp)# broadcastdelay 5000
```

interface (NTP)

To enter a Network Time Protocol (NTP) interface mode and run NTP interface configuration commands, use the **interface** command in one of the NTP configuration modes. To remove an NTP interface configuration, use the **no** form of this command.

interface *type interface-path-id* [**vrf** *vrf-name*] [**disable**]
no interface *type interface-path-id* [**disable**]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
vrf *vrf-name*	(Optional) Applies the interface configuration to a specific nondefault VRF.
disable	(Optional) Disables NTP on the specified interface.

Command Default

No NTP interfaces are configured.

Command Modes

NTP configuration mode

VRF-specific NTP configuration mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **interface** command to place the router in NTP interface configuration mode, from which NTP broadcast and multicast servers and clients can be configured. By default, after the NTP process is started, NTP features become available for all interfaces. To exit NTP interface configuration mode, use the **exit** command.

If you use the **interface** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

By default, NTP is enabled on every interface. To disable NTP on a specific interface, use the **interface** command with the **disable** keyword. To reenable NTP on an interface, use the **no** form of the **interface** command with the **disable** keyword.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to enter a VRF-specific NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface TenGiGE 0/1/1/0 vrf vrf_10
RP/0/RP0/CPU0:router(config-ntp-int)#
```

The following example shows a different way to enter a VRF-specific NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp vrf vrf_10
RP/0/RP0/CPU0:router(config-ntp-vrf)# interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)#
```

master

To configure the router to use its own Network Time Protocol (NTP) master clock to synchronize with peers when an external NTP source becomes unavailable, use the **master** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

master [*stratum*]
no master [*stratum*]

Syntax Description

stratum	(Optional) NTP stratum number that the system claims. Range is from 1 to 15. The default is 8.

Command Default

By default, the master clock function is disabled. When the function is enabled, the default stratum is 8.

Command Modes

NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

NTP uses the concept of a "stratum" to describe how many NTP "hops" away a machine is from an authoritative time source. A stratum 1 time server has a radio or atomic clock attached directly. A stratum 2 time server receives its time through NTP from a stratum 1 time server, a stratum 3 from a stratum 2, and so on.

Caution Use the **master** command with extreme caution. It is easy to override other valid time sources using this command, especially if a low-stratum number is configured. Configuring multiple machines in the same network with the **master** command can lead to instability in time-keeping if the machines do not agree on the time.

The networking device is normally synchronized, directly or indirectly, with an external system that has a clock. Cisco IOS XR software does not support directly attached radio or atomic clocks. The **master** command should be used only when there is a temporary disruption in a reliable time service. It should not be employed as an alternative source by itself in the absence of a real-time service.

If the system has the **master** command configured and it cannot reach any clock that has a lower stratum number, the system claims to be synchronized at the configured stratum number. Other systems synchronize with it through NTP.

Note The system clock must have been manually set from some source before the **master** command has an effect. This precaution protects against the distribution of erroneous time after the system is restarted.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a networking device as an NTP master clock to which peers may synchronize:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# master 9
```

master primary-reference-clock

To configure the router to use PTP and external timing sources, such as such as PTP grandmaster, Data over Cable Service Interface Specification (DOCSIS) Timing Interface [DTI] or global positioning system (GPS) clock, as the time-of-day source for NTP and operating system time, use the **master primary-reference-clock** command in NTP configuration mode. To remove the PTP configuration, use the **no** form of this command.

master primary-reference-clock
no master primary-reference-clock

Syntax Description

This command has no keywords or arguments.

Command Default

PTP is not used as the time-of-day source for NTP.

Command Modes

NTP configuration

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PTP must be enabled on the router before this command can be used. If PTP is not enabled, you receive an error message similar to the following when you try to commit the configuration:

```
RP/0/RP0/CPU0:router(config)# ntp master primary-reference-clock
RP/0/RP0/CPU0:router(config)# commit

% Failed to commit one or more configuration items. Please issue
'show configuration failed' from this session to view the errors

RP/0/RP0/CPU0:router(config)# show configuration failed
[:::]
ntp
 master primary-reference-clock
!!% 'ip-ntp' detected the 'fatal' condition 'PTP is not supported on this platform'
!
end
```

To verify that PTP is used as the reference clock, use the **show ntp association** command.

```
RP/0/RP0/CPU0:router# show ntp association

  address           ref clock        st   when  poll reach  delay  offset  disp
*~127.127.45.1     .PTP.            0    54    64   377    0.00   6.533   1.905

* sys_peer, # selected, + candidate, - outlayer, x falseticker, ~ configured
```

Task ID

Task ID	Operation
ip-services	read, write

This example shows how to configure PTP as the reference clock for NTP:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# master primary-reference-clock
```

Related Topics

master, on page 257

max-associations

To set the maximum number of Network Time Protocol (NTP) associations, use the **max-associations** command in NTP configuration mode. To restore the default setting, use the **no** form of this command.

max-associations *number*
no max-associations *number*

Syntax Description

number	Maximum number of NTP associations. Range is from 0 to 4294967295. The default is 100.

Command Default

The default setting for the maximum number of NTP associations is 100.

Command Modes

NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **max-associations** command to specify the maximum number of associations for an NTP server.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to set the maximum number of associations to 200:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# max-associations 200
```

Related Topics

show ntp associations, on page 276

multicast client

To configure an NTP interface as an NTP multicast client, use the **multicast client** command in NTP interface configuration mode. To remove the NTP multicast client configuration from an interface, use the **no** form of this command.

multicast client [*ip-address*]
no multicast client [*ip-address*]

Syntax Description

ip-address	IPv4 or IPv6 IP address of the multicast group to join. The default is the IPv4 address 224.0.1.1.

Command Default

The interface is not configured as an NTP multicast client.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **multicast client** command to configure an NTP interface to receive multicast packets that are sent to an IPv4 or IPv6 multicast group IP address. If you do not specify an IP address, the interface is configured to receive multicast packets sent to the IPv4 multicast group address 224.0.1.1. You can configure multiple multicast groups on the same interface.

To prevent synchronization with unauthorized systems, whenever this command is specified, authentication must be enabled using the **authenticate (NTP)** command or access must be restricted to authorized systems using the **access-group (NTP)** command. See the documentation of the respective commands for more information.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to receive NTP multicast packets to the multicast group address of 224.0.1.1:

```
RP/0/RP0/CPU0:router(config)# ntp interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)# multicast client
```

Related Topics

multicast destination, on page 263

multicast destination

To configure an NTP interface as an NTP multicast server, use the **multicast destination** command in NTP interface configuration mode. To remove the NTP multicast server configuration from an interface, use the **no** form of this command.

multicast destination *ip-address* [**key** *key-id*] [**ttl** *ttl*] [**version** *number*]
no multicast destination *ip-address* [**key** *key-id*] [**ttl** *ttl*] [**version** *number*]

Syntax Description

ip-address	The IPv4 or IPv6 multicast group IP address to which to send NTP multicast packets.
key *key-id*	(Optional) Specifies an authentication key, where the value of the *key-id* argument is the authentication key to use when sending multicast packets to the specified multicast group.
ttl *ttl*	(Optional) Specifies the time to live (TTL) of a multicast packet.
version *number*	(Optional) Specifies the NTP version number.

Command Default

The interface is not configured as an NTP multicast server.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to send NTP multicast packets to the multicast group address of 224.0.1.1:

```
RP/0/RP0/CPU0:router(config)# ntp interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)# multicast destination 224.0.1.1
```

Related Topics

multicast client, on page 262

ntp

To enter Network Time Protocol (NTP) configuration mode and run NTP configuration commands, use the **ntp** command in

XR Config

configuration mode.

ntp [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Enters a VRF-specific NTP configuration mode.

Command Default

No defaults behavior or values

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

NTP configuration commands can also be run from global configuration mode by preceding the command string with the **ntp** keyword. From NTP configuration mode, the following NTP configuration commands are available:

```
RP/0/RP0/CPU0:router(config-ntp)# ?

    access-group        Control NTP access
    authenticate        Authenticate time sources
    authentication-key  Authentication key for trusted time sources
    broadcastdelay      Estimated round-trip delay
    commit              Commit the configuration changes to running
    default             Set a command to its defaults
    describe            Describe a command without taking real actions
    do                  Run an exec command
    exit                Exit from this submode
    interface           Configure NTP on an interface
    master              Act as NTP master clock
    max-associations    Set maximum number of associations
    no                  Negate a command or set its defaults
    peer                Configure NTP peer
    port                Enable NTP port
    server              Configure NTP server
    show                Show contents of configuration
    source              Configure interface for source address
    trusted-key         Key numbers for trusted time sources
    update-calendar     Periodically update calendar with NTP time
```

Use the **ntp** command with the **vrf** *vrf-name* keyword and argument to enter an NTP configuration mode specific to the specified VRF.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to enter NTP configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)#
```

The following example shows how to enter an NTP configuration mode for a VRF called VRF1:

```
RP/0/RP0/CPU0:router(config)# ntp vrf vrf1
RP/0/RP0/CPU0:router(config-ntp-vrf)#
```

ntp clear

To clear all Network Time Protocol (NTP) peers or a specific NTP peer, use the **ntp clear** command in XR EXEC mode.

ntp clear {*peer* | **all** | **vrf** *vrf-name* *ip-address*}

Syntax Description

peer	IPv4 address or hostname of the NTP peer to be cleared.
all	Clears all NTP peers.
vrf *vrf-name*	Clears a peer on the specified nondefault VRF.
ip-address	IPv4 or IPv6 IP address of the peer.

Command Default

No defaults behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to clear all NTP peers:

```
RP/0/RP0/CPU0:router# ntp clear all
```

ntp passive

To configure passive Network Time Protocol (NTP) associations, use the **ntp passive** command in global configuration mode. To disable the passive NTP associations, use the **no** form of this command.

ntp passive
no ntp passive

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP associations are configured by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to configure the 'passive' peer mode of NTP. Peer mode configurations can be ‘symmetric active’ or ‘symmetric passive’ mode as per NTP RFC standard 5905. In the symmetric variant, a peer operates as both a server and client using either a symmetric active or symmetric passive association.

The passive mode is created when a message is received from a peer operating in the symmetric active mode and persists only as long as the peer is reachable and operating at a stratum level less than or equal to the host. Otherwise, the association is dissolved.

Task ID

Task ID	Operations
Ip-services	read, write

The following example shows how to configure the NTP passive mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ntp passive
```

ntp reset drift

To reset the NTP drift and loopfilter state, use the **ntp reset drift** command in

XR EXEC

mode.

ntp reset drift

Syntax Description

This command has no keywords or arguments.

Command Default

No defaults behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **ntp reset drift** command to set the loopfilter state to NSET (never set) and reset the drift. Resetting the loopfilter state and drift enables the router to relearn the frequency of the NTP server clock. This is necessary if there is a synchronization error caused by a large frequency error. This can arise, for example, if the router switches from synchronizing with one NTP server to synchronizing with another NTP server with a different frequency.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to reset the NTP drift and loopfilter state:

```
RP/0/RP0/CPU0:router# ntp reset drift

Thu Nov 13 11:21:04.381 JST
```

The following example shows NTP status before and after resetting NTP drift and loopfilter state:

```
RP/0/RP0/CPU0:router# show ntp status

Thu Nov 13 11:20:53.122 JST

Clock is synchronized, stratum 3, reference is 192.168.128.5
nominal freq is 1000.0000 Hz, actual freq is 1000.2787 Hz, precision is 2**24
reference time is CCC60CBE.9F836478 (11:17:34.623 JST Thu Nov 13 2008)
```

```
clock offset is -3.172 msec, root delay is 189.289 msec
root dispersion is 70.03 msec, peer dispersion is 0.11 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is -0.0002785891 s/s
system poll interval is 128, last update was 199 sec ago

RP/0/RP0/CPU0:router# ntp reset drift
Thu Nov 13 11:21:04.381 JST

RP/0/RP0/CPU0:router# show ntp status
Thu Nov 13 11:21:10.595 JST

Clock is unsynchronized, stratum 16, no reference clock
nominal freq is 1000.0000 Hz, actual freq is 1000.0000 Hz, precision is 2**24
reference time is CCC60CBE.9F836478 (11:17:34.623 JST Thu Nov 13 2008)
clock offset is -3.172 msec, root delay is 0.000 msec
root dispersion is 0.09 msec, peer dispersion is 0.00 msec
loopfilter state is 'NSET' (Never set), drift is 0.0000000000 s/s
system poll interval is 64, last update was 216 sec ago
```

Related Topics

show ntp status, on page 277

peer (NTP)

To configure the system clock to synchronize a peer or to be synchronized by a peer, use the **peer** command in one of the NTP configuration modes. To remove the **peer** command from the configuration file and restore the system to its default condition with respect to the command, use the **no** form of this command.

peer [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] *ip-address* [**version** *number*] [**key** *key-id*] [**minpoll** *interval*] [**maxpoll** *interval*] [**source** *type interface-path-id*] [**prefer**] [**burst**] [**iburst**]
no peer [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] *ip-address*

Syntax Description

vrf *vrf-name*	(Optional) Applies the peer configuration to the specified nondefault VRF.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
ip-address	IPv4 or IPv6 address of the peer providing or being provided with the clock synchronization.
version *number*	(Optional) Defines the Network Time Protocol (NTP) version number, where the *number* argument is a value from 1 to 4. The default is 4.
key *key-id*	(Optional) Defines the authentication key, where the *key-id* argument is the authentication key to use when packets are sent to this peer. The authentication key is also used for packets received from the peer. By default, no authentication key is used.
minpoll *interval*	(Optional) Defines the shortest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll *interval*	(Optional) Defines the longest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 10.
source	(Optional) IP source address. The default is the outgoing interface.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
prefer	(Optional) Makes this peer the preferred peer that provides synchronization.
burst	(Optional) Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	(Optional) Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Command Default

No peers are configured by default.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **peer** command to allow this machine to synchronize with the peer, or conversely.

Caution Although using the **prefer** keyword can help reduce the switching among peers, you should avoid using the keyword because it interferes with the source selection mechanism of NTP and can result in a degradation in performance.

The value for the **minpoll** keyword must be less than or equal to the value for the **maxpoll** keyword. If this is not the case, the system issues an error message.

To provide peer-level service (as opposed to client/server-level service), it may be necessary to explicitly specify the NTP version for the peer if it is not version 4.

If you use the **peer** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Note To change the configuration of a specific IP address from peer to server or from server to peer, use the **no** form of the **peer** or **server** command to remove the current configuration before you perform the new configuration. If you do not remove the old configuration before performing the new configuration, the new configuration does not overwrite the old configuration.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a networking device to allow its system clock to be synchronized with the clock of the peer (or conversely) at IP address 10.0.0.0 using NTP. The source IP address is the address of interface 0/0/0/1.

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# peer 10.0.0.0 minpoll 8 maxpoll 12 source tengige 0/0/0/1
```

Related Topics

authentication-key (NTP), on page 248
server (NTP), on page 273
source (NTP), on page 279

server (NTP)

To allow the system clock to be synchronized by a time server, use the **server** command in one of the NTP configuration modes. To remove the **server** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

server [**vrf** *vrf-name*][**admin-plane**][{**ipv4** | **ipv6**}] *ip-address* [**version** *number*] [**key** *key-id*] [**minpoll** *interval*] [**maxpoll** *interval*] [**source** *type interface-path-id*][**prefer**] [**burst**] [**iburst**]
no server [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] *ip-address*

Syntax Description

vrf *vrf-name*	(Optional) Applies the server configuration to the specified nondefault VRF.
admin-plane	(Optional) Specifies the admin-plane clock source as the time server.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
ip-address	IPv4 or IPv6 address of the time server providing the clock synchronization.
version *number*	(Optional) Defines the Network Time Protocol (NTP) version number, where the *number* argument is a value from 1 to 4. The default is 4.
key *key-id*	(Optional) Defines the authentication key, where the *key-id* argument is the authentication key to use when packets are sent to this peer. By default, no authentication key is used.
minpoll *interval*	(Optional) Defines the shortest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll *interval*	(Optional) Defines the longest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 10.
source	(Optional) Specifies the IP source address. The default is the outgoing interface.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
prefer	(Optional) Makes this peer the preferred server that provides synchronization.
burst	(Optional) Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	(Optional) Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Command Default

No servers are configured by default.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The admin-plane clock should be synchronized to an external source when using the keyword **admin-plane**.

The value for the **minpoll** keyword must be less than or equal to the value for the **maxpoll** keyword. If this is not the case, the system issues an error message.

Using the **prefer** keyword reduces switching back and forth among servers.

If you use the **server** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Note To change the configuration of a specific IP address from peer to server or from server to peer, use the **no** form of the **peer** or **server** command to remove the current configuration before you perform the new configuration. If you do not remove the old configuration before performing the new configuration, the new configuration does not overwrite the old configuration.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a router to allow its system clock to be synchronized with the clock of the peer at IP address 209.165.201.1 using NTP:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# server 209.165.201.1 minpoll 8 maxpoll 12
```

Related Topics

authentication-key (NTP), on page 248
peer (NTP), on page 270
source (NTP), on page 279

show calendar

To display the system time and date, use the **show calendar** command in the System Admin EXEC and XR EXEC mode.

show calendar

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

The time format of the **show calendar** output depends on the time format set using the **clock timezone** command.

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show calendar** command:

```
sysadmin-vm:0_RP0# show calendar
Thu Jul  18 17:32:28.640 UTC
```

Related Topics

show clock, on page 46

show ntp associations

To display the status of Network Time Protocol (NTP) associations and to view the nodes participating in the NTP synchronization, use the **show ntp associations** command in System Admin EXEC mode.

show ntp associations

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Task ID

Task ID	Operations
ip-services	read

This example shows the sample output of the **show ntp associations** command:

```
sysadmin-vm:0_RP0#show ntp associations
Mon Aug  19 20:23:22.775 UTC
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
external:
 12.28.59.200    10.81.254.131    2 u   15   64    1    0.186    0.138   0.000
internal:
 192.0.4.1       127.0.0.1       12 u    4   64    1    0.171   17.240   0.000
```

Related Topics

show ntp status, on page 277

show ntp status

To display the status of Network Time Protocol (NTP), use the **show ntp status** command in

XR EXEC

mode.

show ntp status [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays the status of NTP from the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

No defaults behavior or values

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read

This example shows sample output from the **show ntp status** command:

```
RP/0/RP0/CPU0:router# show ntp status

Clock is synchronized, stratum 3, reference is 192.168.128.5
nominal freq is 1000.0000 Hz, actual freq is 1000.0021 Hz, precision is 2**24
reference time is CC38EC6A.8FCCA1C4 (10:10:02.561 JST Tue Jul 29 2008)
clock offset is -124.051 msec, root delay is 174.060 msec
root dispersion is 172.37 msec, peer dispersion is 0.10 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is -0.0000021106 s/s
system poll interval is 32, last update was 19 sec ago
```

Table 22: show ntp status Field Descriptions

Field	Description
synchronized	Synchronized system to an NTP peer.
stratum	NTP stratum of this system.

Field	Description
reference	IPv4 address or first 32 bits of the MD5 hash of the IPv6 address of the peer to which clock is synchronized.
vrf	VRF through which the peer routes.
nominal freq	Nominal frequency in Hertz (Hz) of the system hardware clock.
actual freq	Measured frequency in Hz of the system hardware clock.
precision	Precision of the clock of this system in Hz.
reference time	Reference time stamp.
clock offset	Offset of clock to synchronized peer, in milliseconds.
root delay	Total delay along path to root clock, in milliseconds.
root dispersion	Dispersion of root path.
peer dispersion	Dispersion of synchronized peer.
loopfilter state	The state of the clock state machine transition function.
drift	Drift of the hardware clock.
system poll interval	Poll interval of the peer.
last update	Time the router last updated its NTP information.

Related Topics

show ntp associations, on page 276

source (NTP)

To use a particular source address in Network Time Protocol (NTP) packets, use the **source** command in one of the NTP configuration modes. To remove the **source** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

source [**vrf** *vrf-name*] *type interface-path-id*
no source

Syntax Description

vrf *vrf-name*	(Optional) Applies the source address configuration to the specified nondefault VRF.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

The source address is determined by the outgoing interface.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **source** command to use a particular source IP address for all NTP packets. The address is taken from the named interface. This command is useful if the address on an interface cannot be used as the destination for reply packets. If the **source** keyword has been configured with the **server** (NTP) or **peer** (NTP) command, that value overrides the global value.

Use the **source** command in a VRF-specific NTP configuration mode or use the **vrf** *vrf-name* keyword and argument to configure the source address for a specific nondefault VRF. Otherwise, the configuration is applied to the default VRF.

Task ID

Task ID	Operations
ip-services	read, write

This example shows how to configure the router to use the IP address of interface 0/0/0/1 as the source address of all outgoing NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# source tengige 0/0/0/1
```

Related Topics

peer (NTP), on page 270
server (NTP), on page 273

trusted-key

To designate a Network Time Protocol (NTP) trusted key, use the **trusted-key** command in NTP configuration mode. To remove the **trusted-key** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

trusted-key *key-number*
no trusted-key *key-number*

Syntax Description

key-number	Authentication key number to be trusted. Range is from 1 to 65535.

Command Default

No NTP trusted key is designated.

Command Modes

NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If authentication is enabled, use the **trusted-key** command to define one or more key numbers (corresponding to the keys defined with the **authentication-key** [NTP] command) that a NTP system must provide in its NTP packets for this system to synchronize to it. Because the other system must know the correct authentication key, this precaution provides protection against accidentally synchronizing the system to a system that is not trusted.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to systems providing authentication key 42 in its NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

Related Topics

authenticate (NTP), on page 246

authentication-key (NTP), on page 248

update-calendar

To update the calendar periodically from Network Time Protocol (NTP), use the **update-calendar** command in NTP configuration mode. To remove the **update-calendar** command from the configuration file and restore the system to its default condition with respect to the command, use the **no** form of this command.

update-calendar
no update-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

This command is disabled.

Command Modes

NTP configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 6.4.1	NTP authentication is enabled by default.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Your router has a calendar that is separate from the software clock. This calendar runs continuously, even if the router is powered off or rebooted.

If a router is synchronized to an outside time source through NTP, it is a good idea to update the router's calendar with the time learned from NTP. Otherwise, the calendar may gradually lose or gain time.

After you configure the **update-calendar** command, NTP updates the calendar with the software clock every hour.

Task ID

Task ID	Operations
ip-services	read, write

This example shows how to configure the router to update the calendar periodically from the software clock:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# update-calendar
```

Related Topics

clock read-calendar, on page 30

clock update-calendar, on page 37

Process and Memory Management Commands

This chapter describes the Cisco IOS XR software commands used to manage processes and memory.

For more information about using the process and memory management commands to perform troubleshooting tasks, see .

- clear context, on page 286
- dumpcore, on page 287
- exception coresize, on page 290
- exception filepath, on page 292
- exception pakmem, on page 295
- exception sparse, on page 297
- exception sprsize, on page 299
- follow, on page 301
- monitor threads, on page 303
- process, on page 307
- process mandatory, on page 309
- show context, on page 311
- show dll, on page 314
- show exception, on page 317
- show memory, on page 319
- show memory compare, on page 321
- show memory heap, on page 324
- show processes, on page 325

clear context

To clear core dump context information, use the **clear context** command in the appropriate mode.

clear context location {*node-id* | **all**}

Syntax Description

location {*node-id* | **all**}	(Optional) Clears core dump context information for a specified node. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear context** command to clear core dump context information. If you do not specify a node with the **location** *node-id* keyword and argument, this command clears core dump context information for all nodes.

Use the **show context** command to display core dump context information.

Task ID

Task ID	Operations
diag	execute

The following example shows how to clear core dump context information:

```
RP/0/RP0/CPU0:router# clear context
```

Related Topics

show context, on page 311

dumpcore

To manually generate a core dump, use the **dumpcore** command in XR EXEC mode orSystem Admin EXEC mode.

dumpcore {**running** | **suspended**} *job-id* **location** *node-id*

Syntax Description

running	Generates a core dump for a running process.
suspended	Suspends a process, generates a core dump for the process, and resumes the process.
job-id	Process instance identifier.
location *node-id*	Generates a core dump for a process running on the specified node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

System Admin EXEC mode

XR EXEC mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

When a process crashes on the Cisco IOS XR software, a core dump file of the event is written to a designated destination without bringing down the router. Upon receiving notification that a process has terminated abnormally, the Cisco IOS XR software then respawns the crashed process. Core dump files are used by Cisco Technical Support Center engineers and development engineers to debug the Cisco IOS XR software.

Core dumps can be generated manually for a process, even when a process has not crashed. Two modes exist to generate a core dump manually:

- **running** —Generates a core dump for a running process. This mode can be used to generate a core dump on a critical process (a process whose suspension could have a negative impact on the performance of the router) because the core dump file is generated independently, that is, the process continues to run as the core dump file is being generated.
- **suspended** —Suspends a process, generates a core dump for the process, and resumes the process. Whenever the process is suspended, this mode ensures data consistency in the core dump file.

Core dump files contain the following information about a crashed process:

- Register information
- Thread status information
- Process status information
- Selected memory segments

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to generate a core dump in suspended mode for the process instance 52:

```
RP/0/RP0/CPU0:router# dumpcore suspended 52

RP/0/RP0/CPU0:Sep 22 01:40:26.982 : sysmgr[71]: process in stop/continue state 4104
RP/0/RP0/CPU0Sep 22 01:40:26.989 : dumper[54]: %DUMPER-4-CORE_INFO : Core for pid = 4104
 (pkg/bin/devc-conaux) requested by pkg/bin/dumper_gen@node0_RP0_CPU0
RP/0/RP0/CPU0Sep 22 01:40:26.993 : dumper[54]: %DUMPER-6-SPARSE_CORE_DUMP :
 Sparse core dump as configured dump sparse for all
RP/0/RP0/CPU0Sep 22 01:40:26.995 : dumper[54]: %DUMPER-7-DLL_INFO_HEAD : DLL path
 Text addr.  Text size   Data addr.  Data size   Version
RP/0/RP0/CPU0Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libplatform.dll  0xfc0d5000  0x0000a914  0xfc0e0000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysmgr.dll  0xfc0e2000  0x0000ab48  0xfc0c295c  0x00000368        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libinfra.dll  0xfc0ed000  0x00032de0  0xfc120000  0x00000c90        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libios.dll  0xfc121000  0x0002c4bc  0xfc14e000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libc.dll  0xfc150000  0x00077ae0  0xfc1c8000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsyslog.dll  0xfc1d2000  0x0000530c  0xfc120c90  0x00000308        0
RP/0/RP0/CPU0Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libbackplane.dll  0xfc1d8000  0x0000134c  0xfc0c2e4c  0x000000a8        0
RP/0/RP0/CPU0Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libnodeid.dll  0xfc1e5000  0x00009114  0xfc1e41a8  0x00000208        0
RP/0/RP0/CPU0Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
```

```
 /pkg/lib/libttyserver.dll  0xfc1f1000  0x0003dfcc  0xfc22f000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttytrace.dll  0xfc236000  0x00004024  0xfc1e44b8  0x000001c8        0
RP/0/RP0/CPU0Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libdebug.dll  0xfc23b000  0x0000ef64  0xfc1e4680  0x00000550        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_procfs_util.dll  0xfc24a000  0x00004e2c  0xfc1e4bd0  0x000002a8        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdb.dll  0xfc24f000  0x000452e0  0xfc295000  0x00000758        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdbutils.dll  0xfc296000  0x0000ae08  0xfc295758  0x000003ec        0
RP/0/RP0/CPU0Sep 22 01:40:27.002 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_tty_svr_error.dll  0xfc2a1000  0x0000172c  0xfc1e4e78  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.002 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_tty_error.dll  0xfc2a3000  0x00001610  0xfc1e4f00  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.003 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libwd_evm.dll  0xfc2a5000  0x0000481c  0xfc295b44  0x00000188        0
RP/0/RP0/CPU0Sep 22 01:40:27.003 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttydb.dll  0xfc2aa000  0x000051dc  0xfc295ccc  0x00000188        0
RP/0/RP0/CPU0Sep 22 01:40:27.004 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttydb_error.dll  0xfc23a024  0x00000f0c  0xfc295e54  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.004 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/librs232.dll  0xfc2b0000  0x00009c28  0xfc2ba000  0x00000470        0
RP/0/RP0/CPU0Sep 22 01:40:27.005 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_rs232_error.dll  0xfc2bb000  0x00000f8c  0xfc295edc  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.005 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libst16550.dll  0xfc2bc000  0x00008ed4  0xfc2ba470  0x00000430        0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libconaux.dll  0xfc2c5000  0x00001dc0  0xfc2ba8a0  0x000001a8        0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_conaux_error.dll  0xfc1ee114  0x00000e78  0xfc295f64  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttyutil.dll  0xfc2c7000  0x00003078  0xfc2baa48  0x00000168        0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libbag.dll  0xfc431000  0x0000ee98  0xfc40cc94  0x00000368        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libchkpt.dll  0xfc474000  0x0002ecf8  0xfc4a3000  0x00000950        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdbbackend.dll  0xfc8ed000  0x0000997c  0xfc8d3aa8  0x0000028c        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttymgmtconnection.dll  0xfce85000  0x00004208  0xfce8a000  0x00000468
0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttymgmt.dll  0xfcea4000  0x0000e944  0xfce8abf0  0x000003c8        0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttynmspc.dll  0xfcec7000  0x00004a70  0xfcec6644  0x000002c8        0
RP/0/RP0/CPU0Sep 22 01:40:28.396 : dumper[54]: %DUMPER-5-CORE_FILE_NAME :
 Core for process pkg/bin/devc-conaux at harddisk:/coredump/devc-conaux.by.
 dumper_gen.sparse.20040922-014027.node0_RP0_CPU0.ppc.Z
RP/0/RP0/CPU0Sep 22 01:40:32.309 : dumper[54]: %DUMPER-5-DUMP_SUCCESS : Core dump success
```

exception coresize

Halts the creation of the core file beyond the configured core file size limit.

exception coresize *size*
no exception coresize

Syntax Description

coresize	*size*	Defines the maximum limit of the core file size beyond which the core file creation is halted and only the stack trace output is printed on the screen. The core file size limit can range from 1 to 4095 MB.

Command Default

This command has no default behavior.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how you can disable the creation of core dump files by specifying the limit for core file size.

```
RP/0/RP0/CPU0:router(config)# exception coresize 1024
RP/0/RP0/CPU0:router(config)# commit
```

exception filepath

To modify core dump settings, use the **exception filepath** command in the appropriate configuration mode. To remove the configuration, use the **no** form of this command.

exception filepath*filepath-name*
noexception filepath*filepath-name*

Syntax Description

filepath-name	Local file system or network protocol, followed by the directory path. All local file systems are supported. The following network protocols are supported: TFTP and FTP.

Command Default

If you do not specify the order of preference for the destination of core dump files using the **choice** *preference* keyword and argument, the default preference is the primary location or 1.

Core dump files are sent compressed.

The default file naming convention used for core dump files is described in Table 23: Default Core Dump File Naming Convention Description, on page 293.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception filepath** command to modify core dump settings, such as the destination file path to store core dump files, file compression, and the filename appended to core dumps.

Up to three user-defined locations may be configured as the preferred destinations for core dump files:

- Primary location—The primary destination for core dump files. Enter the **choice** keyword and a value of **1** (that is, **choice 1**) for the *preference* argument to specify a destination as the primary location for core dump files.
- Secondary location—The secondary fallback choice for the destination for core dump files, if the primary location is unavailable (for example, if the hard disk is set as the primary location and the hard disk fails). Enter the **choice** keyword and a value of **2** (that is, **choice 2**) for the *preference* argument to specify a destination as the secondary location for core dump files.
- Tertiary location—The tertiary fallback choice as the destination for core dump files, if the primary and secondary locations fail. Enter the **choice** keyword and a value of 3 (that is, **choice 3**) for the *preference* argument to specify a destination as the tertiary location for core dump files.

When specifying a destination for a core dump file, you can specify an absolute file path on a local file system or on a network server. The following network protocols are supported: TFTP and FTP.

In addition to the three preferred destinations that can be configured, Cisco IOS XR software provides three default fallback destinations for core dump files in the event that user-defined locations are unavailable.

The default fallback destinations are:

Note If a default destination is a boot device, the core dump file is not sent to that destination.

We recommend that you configure at least one preferred destination for core dump files as a preventive measure if the default fallback paths are unavailable. Configuring at least one preferred destination also ensures that core dump files are archived because the default fallback destinations store only the first and last core dump files for a crashed process.

Note Cisco IOS XR software does not save a core file on a local storage device if the size of the core dump file creates a low-memory condition.

By default, Cisco IOS XR software assigns filenames to core dump files according to the following format:

process [.by. *requester* |.abort][.sparse]. *date-time* . *node* . *processor-type* [.Z]

For example:

```
packet.by.dumper_gen.20040921-024800.node0_RP0_CPU0.ppc.Z
```

Table 23: Default Core Dump File Naming Convention Description, on page 293 describes the default core dump file naming convention.

Table 23: Default Core Dump File Naming Convention Description

Field	Description
process	Name of the process that generated the core dump.
.by. *requester* | .abort	If the core dump was generated because of a request by a process (requester), the core filename contains the string ".by.*requester*" where the *requester* variable is the name or process ID (PID) of the process that requested the core dump. If the core dump was due to a self-generated abort call request, the core filename contains the string ".abort" instead of the name of the requester.
.sparse	If a sparse core dump was generated instead of a full core dump, "sparse" appears in the core dump filename.
.date-time	Date and time the dumper process was called by the process manager to generate the core dump. The *.date-time* time-stamp variable is expressed in the *yyyy.mm.dd-hh.mm.ss* format. Including the time stamp in the filename uniquely identifies the core dump filename.
. *node*	Node ID, expressed in the *rack/slot* notation, where the process that generated the core dump was running.
.processor-type	Type of processor (mips or ppc).

Field	Description
.Z	If the core dump was sent compressed, the filename contains the .Z suffix.

You can modify the default naming convention by specifying a filename to be appended to core dump files with the optional **filename** *filename* keyword and argument and by specifying a lower and higher limit ranges of values to be appended to core dump filenames with the *lower-limit* and *higher-limit* arguments, respectively. The filename that you specify for the *filename* argument is appended to the core dump file and the lower and higher limit ranges of core dump files to be sent to a specified destination before the filenames are recycled. Valid values for the *lower-limit* argument are 0 to 4. Valid values for the *higher-limit* argument are 5 to 64. A hyphen (-) must immediately follow the *lower-limit* argument. In addition, to uniquely identify each core dump file, a value is appended to each core dump file, beginning with the lower-limit value specified with the *lower-limit* argument and continuing until the higher-limit value specified with the *higher-limit* argument has been reached. When the configured higher-limit value has been reached, Cisco IOS XR software begins to recycle the values appended to core dump files, beginning with the lower-limit value.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to use the command:

```
RP/0/RP1/CPU0:Linkwood(config)#exception filepath f1
```

Related Topics

exception pakmem, on page 295
exception sparse, on page 297
exception sprsize, on page 299
show exception, on page 317

exception pakmem

To configure the collection of packet memory information in core dump files, use the **exception pakmem** command in administration configuration mode or in global configuration mode. To remove the configuration, use the **no** form of this command.

exception pakmem {**on** | **off**}
no exception pakmem {**on** | **off**}

Syntax Description

on	Enables the collection of packet memory information in core dump files.
off	Disables the collection of packet memory information in core dump files.

Command Default

Packet memory information is not included in core dump files.

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception pakmem** command with the **on** keyword to configure the collection of packet memory information in core dump files. Cisco Technical Support Center engineers and development engineers use packet memory information to debug packet memory issues related to a process.

Caution Including packet memory information in core dump files significantly increases the amount of data generated in the core dump file, which may delay the restart time for the process.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to configure core dumps to include packet memory information:

```
RP/0/RP0/CPU0:router(config)# exception pakmem on
```

Related Topics

exception filepath, on page 292
exception sparse, on page 297
exception sprsize, on page 299
show exception, on page 317

exception sparse

To enable or disable sparse core dumps, use the **exception sparse** command in administration configuration mode or in global configuration mode. To remove the configuration, use the **no** form of this command.

exception sparse {**on** | **off**}
no exception sparse

Syntax Description

on	Enables sparse core dumps.
off	Disables sparse core dumps

Command Default

Sparse core dumps are disabled.

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception sparse** command to reduce the amount of data generated in the core dump file. Sparse core dumps reduce the amount of time required to generate the core dump file because only referenced data is generated in the core file (at the cost of lost information in the core file). Reducing the time required to generate core dump files corresponds to faster process restart times.

Note Use the **exception sparse off** command in administration configuration mode to get a complete coredump of the transient processes on the RP.

Sparse core dumps contain the following information about crashed processes:

- Register information for all threads, and any memory pages referenced in these register values
- Stack information for all threads, and any memory pages referenced in these threads
- All memory pages referenced by a loaded dynamic loadable library (DLL) data section, if the final program counter falls in a DLL data section
- Any user-specified marker pages from the lib_dumper_marker DLL

The **exception sparse** command dumps memory pages based on trigger addresses found in the previously listed dump information, according to the following criteria:

- If the trigger address in the memory page is in the beginning 128 bytes of the memory page, the previous memory page in the continuous address region is dumped also.
- If the trigger address in the memory page is in the final 128 bytes of the memory page, the next memory page in the continuous address region is dumped also.
- In all other instances, only the memory page that includes the trigger address is dumped.

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to enable sparse core dumps:

```
RP/0/RP0/CPU0:router(config)# exception sparse on
```

Related Topics

exception filepath, on page 292
exception pakmem, on page 295
exception sprsize, on page 299
show exception, on page 317

exception sprsize

To specify the maximum file size for core dumps, use the **exception sprsize** command in administration configuration mode or in global configuration mode. To remove the configuration, use the **no** form of this command.

exception sprsize *megabytes*
no exception sprsize

Syntax Description

megabytes	Size in megabytes (MB).

Command Default

megabytes : 192

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception sprsize** command to specify the maximum file size for core dumps. The maximum file size configured for the *megabytes* argument is used with the configuration set for the exception sparse, on page 297 command to determine whether or not to generate a sparse core dump file. If sparse core dumps are disabled and a core dump file is predicted to exceed the default value (192 MB) uncompressed or the value specified for the *megabytes* argument uncompressed, a sparse core dump file is generated. If sparse core dumps are enabled, a sparse core dump file is generated, regardless of the size of the core dump file.

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to set the file size of sparse core dumps to 300 MB:

```
RP/0/RP0/CPU0:router(config)# exception sprsize 300
```

Related Topics

exception sparse, on page 297

follow

To unobtrusively debug a live process or a live thread in a process, use the **follow process** command in XR EXEC modeSystem Admin EXEC mode.

follow process [{*pid* | **location** *node-id*}]

Syntax Description

pid	Follows the process with the process ID (PID) specified for the *pid* argument.
location *node-id*	Follows the target process on the designated node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

Entering the **follow process** command without any keyword displays the stack information of the live processes with all the threads, heap memory usage, and register values.

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

Use this command to unintrusively debug a live process or a live thread in a process. This command is particularly useful for debugging deadlock and livelock conditions, for examining the contents of a memory location or a variable in a process to determine the cause of a corruption issue, or in investigating issues where a thread is stuck spinning in a loop. A livelock condition is one that occurs when two or more processes continually change their state in response to changes in the other processes.

The following actions can be specified with this command:

- Follow all live threads of a given process or a given thread of a process and print stack trace in a format similar to core dump output.
- Display register values and status information of the target process.

Take a snapshot of the execution path of a thread asynchronously to investigate performance-related issues by specifying a high number of iterations with a zero delay.

Task ID

Task ID	Operations
basic-services	read

This example shows how to use the **follow process** command:

```
sysadmin-vm:0_RP0# follow process 1 location 0/RP0

Location : 0/RP0
```

```
************************************************************

2013-09-20 01:57:30
Text address        Size        Library name
-----------------------------------------
00007f4b8a66c000 48 r-x--   libnss_files-2.12.so
00007f4b8a879000 1444 r-x--   libc-2.12.so
00007f4b8abec000 48 r-x--   libpci.so
00007f4b8adf9000 32 r-x--   librt-2.12.so
00007f4b8b002000 248 r-x--   libdbus-1.so.3.4.0
00007f4b8b241000 96 r-x--   libpthread-2.12.so
00007f4b8b45e000 128 r-x--   ld-2.12.so
-----------------------------------------
#0  0x00007f4b8a955c83 in select+0x13 from /lib64/libc-2.12.so
#1  0x000000000041f974 in ?? () from /sbin/init
#2  0x0000000000404b9d in ?? () from /sbin/init
#3  0x00007f4b8a897cce in __libc_start_main+0xfe from /lib64/libc-2.12.so
#4  0x0000000000404659 in ?? () from /sbin/init
```

Related Topics

monitor threads, on page 303
show processes, on page 325

monitor threads

To display auto-updating statistics on threads in a full-screen mode, use the **monitor threads** command in

XR EXEC

mode.

monitor threads [**dumbtty**] [**iteration** *number*] [**location** *node-id*]

Syntax Description

dumbtty	(Optional) Displays the output of the command as if on a dumb terminal (the screen is not refreshed).
iteration *number*	(Optional) Number of times the statistics display is to be updated, in the range from 0 to 4294967295.
location *node-id*	(Optional) Displays the output from the command from the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

When all keywords are omitted, the **monitor threads** command displays the first ten threads for the local node, sorted in descending order by the time used. The display is cleared and updated every 5 seconds until you quit the command.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **monitor threads** command to show the top ten threads based on CPU usage. The display refreshes every 10 seconds.

- To change the parameters displayed by the **monitor threads** command, enter one of the key commands described in Table 24: Interactive Display Commands for the monitor threads Command, on page 304.
- To terminate the display and return to the system prompt, enter the **q** key.
- To list the interactive commands, type ? during the display.

Table 24: Interactive Display Commands for the monitor threads Command, on page 304 describes the available interactive display commands.

Table 24: Interactive Display Commands for the monitor threads Command

Command	Description
?	Displays the available interactive commands.
d	Changes the delay interval between updates.
k	Kills a process.
l	Refreshes the screen.
n	Changes the number of threads to be displayed.
q	Quits the interactive display and returns the prompt to EXEC mode.

Task ID

Task ID	Operations
basic-services	execute

The following example shows sample output from the **monitor threads** command:

```
RP/0/RP0/CPU0:router# monitor threads

195 processes; 628 threads;
CPU states: 98.2% idle, 0.9% user, 0.7% kernel
Memory: 2048M total, 1576M avail, page size 4K

   JID   TID LAST_CPU PRI STATE  HH:MM:SS      CPU  COMMAND
     1    12   1       10 Rcv     0:00:09     0.42% procnto-600-smp-cisco-instr
     1    25   1       10 Run     0:00:30     0.36% procnto-600-smp-cisco-instr
   342     1   1       19 Rcv     0:00:07     0.20% wdsysmon
    52     5   0       21 Rcv     0:00:03     0.15% devc-conaux
    52     3   1       18 Rcv     0:00:02     0.07% devc-conaux
532670     1   0       10 Rply    0:00:00     0.07% top
   293     6   0       55 Rcv     0:00:06     0.03% shelfmgr
    55     8   0       10 Rcv     0:00:02     0.03% eth_server
   315     3   0       10 Rcv     0:00:11     0.03% sysdb_svr_local
    55     7   0       55 Rcv     0:00:11     0.02% eth_server
```

The following example shows sample output from the **monitor threads** command using the optional **location** keyword:

```
RP/0/RP0/CPU0:router# monitor threads location 0/RP0/CPU0

Computing times...195 processes; 628 threads;
CPU states: 95.1% idle, 2.7% user, 2.0% kernel
Memory: 2048M total, 1576M avail, page size 4K

   JID   TID LAST_CPU PRI STATE  HH:MM:SS      CPU  COMMAND
     1    25   0       10 Run     0:00:32     2.08% procnto-600-smp-cisco-instr
   265     5   0       10 SigW    0:00:09     0.89% packet
   279     1   1       10 Rcv     0:00:00     0.65% qsm
557246     1   0       10 Rply    0:00:00     0.51% top
   293     5   1       55 Rcv     0:00:01     0.07% shelfmgr
   180    13   1       10 Rcv     0:00:02     0.07% gsp
   315     3   0       10 Rcv     0:00:12     0.07% sysdb_svr_local
```

```
   55     7   1      55 Rcv     0:00:12     0.04% eth_server
  180     1   0      10 Rcv     0:00:01     0.04% gsp
  298     9   0      10 Rcv     0:00:01     0.04% snmpd
```

Table 25: monitor threads Field Descriptions, on page 305 describes the significant fields shown in the display.

Table 25: monitor threads Field Descriptions

Field	Description
JID	Job ID.
TIDS	Thread ID.
LAST_CPU	Number of open channels.
PRI	Priority level of the thread.
STATE	State of the thread.
HH:MM:SS	Run time of process since last restart.
CPU	Percentage of CPU used by process thread.
COMMAND	Process name.

Using Interactive Commands

When the **n** or **d** interactive command is used, the **monitor threads** command prompts for a number appropriate to the specific interactive command. The following example shows sample output from the **monitor threads** command using the interactive **n** command after the first display cycle to change the number of threads:

```
RP/0/RP0/CPU0:router# monitor threads

Computing times... 87 processes; 249 threads;
CPU states: 84.8% idle, 4.2% user, 10.9% kernel
Memory: 256M total, 175M avail, page size 4K

   JID   TID PRI STATE  HH:MM:SS      CPU  COMMAND
     1     6  10 Run     0:00:10    10.92% kernel
553049     1  10 Rply    0:00:00     4.20% top
    58     3  10 Rcv     0:00:24     0.00% sysdbsvr
     1     3  10 Rcv     0:00:21     0.00% kernel
    69     1  10 Rcv     0:00:20     0.00% wdsysmon
     1     5  10 Rcv     0:00:20     0.00% kernel
   159     2  10 Rcv     0:00:05     0.00% qnet
   160     1  10 Rcv     0:00:05     0.00% netio
   157     1  10 NSlp    0:00:04     0.00% envmon_periodic
   160     9  10 Intr    0:00:04     0.00% netio
n

Enter number of threads to display: 3
Please enter a number between 5 and 40
Enter number of threads to display: 8
```

```
87 processes; 249 threads;
CPU states: 95.3% idle, 2.9% user, 1.7% kernel
Memory: 256M total, 175M avail, page size 4K

   JID   TID PRI STATE  HH:MM:SS      CPU  COMMAND
     1     6  10 Run     0:00:11     1.76% kernel
    69     1  10 Rcv     0:00:20     1.11% wdsysmon
    58     3  10 Rcv     0:00:24     0.40% sysdbsvr
   157     1  10 NSlp    0:00:04     0.23% envmon_periodic
   159    19  10 Rcv     0:00:02     0.20% qnet
553049     1  10 Rply    0:00:00     0.20% top
   159    12  10 Rcv     0:00:03     0.13% qnet
   160     1  10 Rcv     0:00:05     0.10% netio
```

When a number outside the acceptable range is entered, the acceptable range is displayed:

```
Please enter a number between 5 and 40
Enter number of threads to display:
```

Related Topics

monitor processes

process

To terminate or restart a process, use the **process** command in the System Admin EXEC mode.

process {**crash** | **restart**} *executable-name* {*IID* **location** *node-id* | **location** *node-id*}

Syntax Description

crash	Ends a process. All active services hosted by the process that have high availability enabled are switched off and the process restarts.
restart	Restarts a process.
executable-name	Executable name of the process to be crashed or restarted. Supplying an executable name for the executable-name argument performs the action for all the simultaneously running instances of the process, if applicable.
IID	Process instance ID of the process to be crashed or restarted. Supplying a process ID for the *IID* argument performs the action for only the process instance associated with the process ID.
location *node-id*	Crashes or restarts a process on the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

Under normal circumstances, processes are started and restarted automatically by the operating system as required. If a process crashes, it is automatically restarted.

Use this command to manually stop or restart individual processes.

Caution Manually stopping or restarting a process can seriously impact the operation of a router. Use these commands only under the direction of a Cisco Technical Support representative.

process restart

The **process restart** command restarts a process, such as a process that is not functioning optimally.

Task ID

Task ID	Operations
root-lr	execute

This example shows how to restart a process:

```
sysadmin-vm:0_RP0# process restart syslogd_helper location 0/3

proc-action-status User root (127.0.0.1) requested restart for process syslogd_helper(0)
at 0/3  'Sending signal 15 to process syslogd_helper(IID 0) pid=1801'
```

Related Topics

process mandatory, on page 309
show processes, on page 325

process mandatory

To set the mandatory reboot options for a process, use the **process mandatory** command in the appropriate mode.

process mandatory
process mandatory {**on** | **off**} {*executable-namejob-id*} **location** *node-id*

process mandatory toggle
process mandatory toggle {*executable-namejob-id*} **location** *node-id*

Syntax Description

on	Turns on mandatory process attribute.
off	Turns off the mandatory process attribute. The process is not considered mandatory.
toggle	Toggles a mandatory process attribute.
executable-name	Executable name of the process to be terminated. Specifying an executable name for the *executable-name* argument terminates the process and all the simultaneously running copies, if applicable.
job-id	Job ID associated with the process to be terminated. Terminates only the process associated with the job ID.
location *node-id*	Sets the mandatory settings for a process on a designated node. The node-id argument is expressed in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If a process unexpectedly goes down, the following action occurs based on whether the process is considered mandatory.

- If the process is mandatory and the process cannot be restarted, the node automatically reboots.
- If the process is not mandatory and cannot be restarted, it stays down and the node does not reboot.

Task ID

Task ID	Operations
root-lr	execute

The following example shows how to turn on a mandatory attribute. In this example, the mandatory attribute is turned on for the media_ether_config_di process.

```
RP/0/RP0/CPU0:router# process mandatory on media_ether_config_di
```

The following example shows how to turn the reboot option on. In this example, the router is set to reboot the node if a mandatory process goes down and cannot be restarted.

```
RP/0/RP0/CPU0:router# process mandatory reboot enable

RP/0/0/CPU0:Mar 19 19:28:10 : sysmgr[71]: %SYSMGR-4-MANDATORY_REBOOT_ENABLE :
mandatory reboot option enabled by request
```

The following example shows how to turn off the reboot option. In this example, the router is set *not* to reboot the node if a mandatory process goes down and cannot be restarted. In this case, the mandatory process is restarted, but the node is not rebooted.

```
RP/0/RP0/CPU0:router# process mandatory reboot disable

RP/0/0/CPU0:Mar 19 19:31:20 : sysmgr[71]: %SYSMGR-4-MANDATORY_REBOOT_OVERRIDE
: mandatory reboot option overridden by request
```

Related Topics

show processes, on page 325

show context

To display core dump context information, use the **show context** command in

XR EXEC

mode.

show context [{*coredump-occurrence* | **clear**}] [**location** {*node-id* | **all**}]

Syntax Description

coredump-occurrence	(Optional) Core dump context information to be displayed based on the occurrence of the core dump. Valid values are 1 to 10.
clear	(Optional) Clears the current context information.
location { *node-id* | **all**}	Displays core dump information that occurred on the designated node. The *node-id* argument is expressed in the *rack/slot* notation. The **all** keyword specifies to display information for all nodes.

Command Default

If no *coredump-occurrence* value is specified, core dump context information for all core dumps is displayed.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show context** command to display core dump context information. This command displays context information for the last ten core dumps. Cisco Technical Support Center engineers and development engineers use this command for post-analysis in the debugging of processes.

Use the clear context, on page 286 command to clear core dump context information.

Task ID

Task ID	Operations
diag	read

The following example shows sample output from the **show context** command:

```
RP/0/RP0/CPU0:router# show context

Crashed pid = 20502 (pkg/bin/mbi-hello)
Crash time: Thu Mar 25, 2004: 19:34:14
```

```
Core for process at disk0:/mbi-hello.20040325-193414.node0_RP0_CPU0

    Stack Trace
#0 0xfc117c9c
#1 0xfc104348
#2 0xfc104154
#3 0xfc107578
#4 0xfc107734
#5 0x482009e4
                Registers info
            r0       r1       r2       r3
  R0   0000000e  481ffa80  4820c0b8  00000003
            r4       r5       r6       r7
  R4   481ffb18  00000001  481ffa88  48200434
            r8       r9      r10      r11
  R8   00000000  00000001  00000000  fc17ac58
           r12      r13      r14      r15
  R12  481ffb08  4820c080  481ffc10  00000001
           r16      r17      r18      r19
  R16  481ffc24  481ffc2c  481ffcb4  00000000
           r20      r21      r22      r23
  R20  00398020  00000000  481ffb6c  4820a484
           r24      r25      r26      r27
  R24  00000000  00000001  4820efe0  481ffb88
           r28      r29      r30      r31
  R28  00000001  481ffb18  4820ef08  00000001
           cnt       lr      msr       pc
  R32  fc168d58  fc104348  0000d932  fc117c9c
           cnd      xer
  R36  24000022  00000004

                      DLL Info
DLL path    Text addr.  Text size   Data addr. Data size   Version
/pkg/lib/libinfra.dll  0xfc0f6000  0x00032698  0xfc0f5268  0x00000cb4
```

The following example shows sample output from the **show context** command. The output displays information about a core dump from a process that has not crashed.

```
RP/0/RP0/CPU0:router# show context

node:      node0_RP0_CPU0
------------------------------------------------------------------

Crashed pid = 28703 (pkg/bin/packet)
Crash time: Tue Sep 21, 2004: 02:48:00
Core for process at harddisk:/packet.by.dumper_gen.20040921-024800.node0_RP0_CPU0.ppc.Z
```

Table 26: show context Field Descriptions, on page 312 describes the significant fields shown in the display.

Table 26: show context Field Descriptions

Field	Description
Crashed pid	Process ID (PID) of the crashed process followed by the executable path.
Crash time	Time and date the crash occurred.
Core for process at	File path to the core dump file.

Field	Description
Stack Trace	Stack trace information.
Registers Info	Register information related to crashed threads.
DLL Info	Dynamically loadable library (DLL) information used to decode the stack trace.

Related Topics

clear context, on page 286

show dll

To display dynamically loadable library (DLL) information, use the **show dll** command in

administration EXEC mode or in EXEC

XR EXEC

mode.

show dll [{**jobid** *job-id* [**virtual**] | [**symbol**]**address** *virtual-address* | **dllname** *dll-virtual-path* | **memory** | **virtual**}] [**location** *node-id*]

Syntax Description

jobid *job-id*	(Optional) Displays DLL information for the specified job identifier.
virtual	(Optional) Displays the virtual path of DLLs. The virtual path is expressed in the /pkg/lib/library-name.dll format where the library name is the name of the DLL followed by the .dll suffix.
symbol	(Optional) Displays the symbol at the virtual address specified for the *virtual-address* argument.
address *virtual-address*	(Optional) Displays the DLL that is mapped at the virtual address specified for the *virtual-address* argument.
dllname *dll-virtual-path*	(Optional) Displays the process IDs (PIDs) of the process that have downloaded the DLL specified for the *dll-virtual-path* argument.
memory	(Optional) Displays a summary of DLL memory usage.
location *node-id*	(Optional) Displays DLLs for the specified node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

EXEC, Administration EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show dll** command. In this example, the output displays all the DLLs loaded on the router.

```
RP/0/RP0/CPU0:router# show dll

DLL path                              Text VA    Text Sz    Data VA    Data Sz    Refcount
------------------------------------------------------------------------------------------
/lib/libui.dll                        0xfc000000 0x00007000 0xfc007000 0x00001000    1
/disk0/-base-0.48.0/lib/liblogin.dll 0xfc008000 0x00006000 0xfc00e000 0x00001000    1
/mbi/lib/libbanner.dll                0xfc00f000 0x00003000 0xfc012000 0x00001000    1
/disk0/-base-0.48.0/lib/libaaav2.dll 0xfc013000 0x0000f000 0xfc022000 0x00001000    1
/disk0/-base-0.48.0/lib/libaaatty.dll 0xfc023000 0x00004000 0xfc027000 0x00001000    1
/mbi/lib/libtermcap.dll               0xfc028000 0x00003000 0xfc02b000 0x00001000    1
/mbi/lib/lib_show_dll.dll             0xfc02c000 0x00004000 0xfc030000 0x00001000    1
/mbi/lib/libihplatform.dll            0xfc0bf2d4 0x00000c18 0xfc1e4f88 0x00000068    1
/lib/libovl.dll                       0xfc0c8000 0x0000c3b0 0xfc0c21f0 0x0000076c   23
/disk0/-admin-0.48.0/lib/libfqm_ltrace_util_common.dll 0xfc0d43b0 0x00000bfc 0xfc391f7c
0x00000068    1
/lib/libplatform.dll                  0xfc0d5000 0x0000aa88 0xfc0e0000 0x00002000  165
/lib/libsysmgr.dll                    0xfc0e2000 0x0000ab48 0xfc0c295c 0x00000368  166
/lib/libinfra.dll                     0xfc0ed000 0x0003284c 0xfc120000 0x00000c70  169
/lib/libios.dll                       0xfc121000 0x0002c4bc 0xfc14e000 0x00002000  166
/lib/libc.dll                         0xfc150000 0x00077ae0 0xfc1c8000 0x00002000  175
/mbi/lib/libltrace.dll                0xfc1ca000 0x00007f5c 0xfc0c2cc4 0x00000188   96
/lib/libsyslog.dll                    0xfc1d2000 0x0000530c 0xfc120c70 0x00000308  129
/disk0/-base-0.48.0/lib/liblpts_ifib_platform.dll 0xfc1d730c 0x00000cc8 0xfcef4000 0x00000068
    1
/lib/libbackplane.dll                 0xfc1d8000 0x0000134c 0xfc0c2e4c 0x000000a8  163
/disk0/-base-0.48.0/lib/libipv6_platform_client.dll 0xfc1d934c 0x00000c48 0xfcef4f8c
0x00000068    1
/mbi/lib/libpkgfs_node.dll            0xfc1da000 0x000092d4 0xfc1e4000 0x000001a8    3
```

The following example shows sample output from the **show dll** command with the optional **jobid** *job-id* keyword and argument:

```
RP/0/RP0/CPU0:router# show dll jobid 186

DLLs mapped by PID 86111
DLL path                              Text VA    Text Sz    Data VA    Data Sz    Refcount
------------------------------------------------------------------------------------------
/lib/libovl.dll                       0xfc0c8000 0x0000c3b0 0xfc0c21f0 0x0000076c   23
/lib/libplatform.dll                  0xfc0d5000 0x0000aa88 0xfc0e0000 0x00002000  165
/lib/libsysmgr.dll                    0xfc0e2000 0x0000ab48 0xfc0c295c 0x00000368  167
/lib/libinfra.dll                     0xfc0ed000 0x0003284c 0xfc120000 0x00000c70  169
/lib/libios.dll                       0xfc121000 0x0002c4bc 0xfc14e000 0x00002000  166
/lib/libc.dll                         0xfc150000 0x00077ae0 0xfc1c8000 0x00002000  175
/mbi/lib/libltrace.dll                0xfc1ca000 0x00007f5c 0xfc0c2cc4 0x00000188   96
/lib/libsyslog.dll                    0xfc1d2000 0x0000530c 0xfc120c70 0x00000308  129
/lib/libbackplane.dll                 0xfc1d8000 0x0000134c 0xfc0c2e4c 0x000000a8  163
/lib/libnodeid.dll                    0xfc1e5000 0x000091fc 0xfc1e41a8 0x00000208  163
/mbi/lib/libinst_mem.dll              0xfc232000 0x000044f8 0xfc1e43b0 0x00000108    4
/lib/libdebug.dll                     0xfc23c000 0x0000ef64 0xfc1e4680 0x00000550  159
```

Table 27: show dll Field Descriptions, on page 316 describes the significant fields shown in the display.

Table 27: show dll Field Descriptions

Field	Description
DLL path	Physical path of the DLL on the router.
Text VA	Virtual address of the text segment of the DLL.
Text Sz	Size of the text segment of the DLL.
Data VA	Virtual address of the data segment of the DLL.
Data Sz	Size of the data segment of the DLL.
Refcount	Number of clients using the DLL.

The following example shows sample output from the **show dll** command with the optional **dllname** *dll-virtual-path* keyword and optional argument:

```
RP/0/RP0/CPU0:router# show dll dllname /pkg/lib/libinst_mem.dll

PID:     4102  Refcount: 1
PID:     4105  Refcount: 1
PID:    24600  Refcount: 1
PID:    86111  Refcount: 1
```

Table 28: show dll dllname Field Descriptions, on page 316 describes the significant fields shown in the display.

Table 28: show dll dllname Field Descriptions

Field	Description
PID:	Process ID of the process.
Refcount	Number of references to the DLL by the process.

The following example shows sample **show dll** output from the command with the optional **memory** keyword:

```
RP/0/RP0/CPU0:router# show dll memory
------------------------------------------------------------------------------

Total DLL Text - 14778896 bytes  Total DLL Data - 12688500 bytes
Total DLL Memory - 27467396 bytes
```

show exception

To display the configured core dump settings, use the **show exception** command in

XR EXEC

mode.

show exception [**core-options** [**process** *process-name*] **location** *node-id*]

Syntax Description

core-options	(Optional) Displays process core option values.
process *process-name*	(Optional) Specifies the process for which to display the information.
location *node-id*	(Optional) Displays configured settings for a specified node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	Support for the **core-options** keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show exception** command to display the configured core dump settings. The output from this command displays the core dump settings configured with the following commands:

- exception filepath, on page 292
- exception pakmem, on page 295
- exception sparse, on page 297
- exception sprsize, on page 299

Task ID

Task ID	Operations
diag	read

The following example shows sample output from the **show exception** command with the **location** keyword. All processes for the specified node are displayed.

```
RP/0/RP0/CPU0:router# show excep core-options location 0/rp0/cpu0

Mon Nov 30 01:31:31.391 PST
```

```
Process
        Options
attach_server:
        TEXT SHAREDMEM MAINMEM
attachd:
        TEXT SHAREDMEM MAINMEM
ksh-aux:
        TEXT SHAREDMEM MAINMEM
bcm_logger:
        TEXT SHAREDMEM MAINMEM
devf-scrp:
        TEXT SHAREDMEM MAINMEM
bfm_server:
        TEXT SHAREDMEM MAINMEM
ksh:
        TEXT SHAREDMEM MAINMEM
dllmgr:
        COPY
dumper:
        TEXT SHAREDMEM MAINMEM
eth_server:
        COPY SPARSE
inflator:
        TEXT SHAREDMEM MAINMEM
insthelper:
        TEXT SHAREDMEM MAINMEM
mbi-hello:
        TEXT SHAREDMEM MAINMEM
cat:
        TEXT SHAREDMEM MAINMEM
mq:
        COPY
mqueue:
        TEXT SHAREDMEM MAINMEM
nname:
        TEXT SHAREDMEM MAINMEM
nvram:
        TEXT SHAREDMEM MAINMEM
 --More--
```

The following example shows sample output from the **show exception** command for a specific process:

```
RP/0/RP0/CPU0:router# show excep core-options process upgrade_daemon location 0/6/cpu0

Mon Nov 30 01:32:20.207 PST
Process
        Options
upgrade_daemon:
        TEXT SHAREDMEM MAINMEM
```

Related Topics

exception filepath, on page 292
exception pakmem, on page 295
exception sparse, on page 297
exception sprsize, on page 299

show memory

To display the available physical memory and memory usage information of processes on the router, use the **show memory** command in System Admin EXEC and XR EXEC mode.

show memory [{**location** *node-id* | **pid** *pid* [**location** *node-id*] | **summary** [**location** *node-id*]}]

Syntax Description

location *node-id*	Displays the available physical memory from the designated node. The *node-id* argument is entered in the *rack/slot* notation.
pid *pid*	Displays memory usage of the specified process.
summary	Displays a summary of the physical memory and memory usage information.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To display detailed memory information for the entire router, enter the **show memory** command without any parameters.

Task ID

Task ID	Operations
basic-services	read

This example shows how to display the output of the **show memory location** command:

```
sysadmin-vm:0_RP0#show memory location 0/RP0
Tue Aug  20 00:49:41.649 UTC
**********************************************************


Location : 0/RP0

**********************************************************

Tue Aug 20 00:49:41 UTC 2013
1:   /sbin/init
Address           Kbytes     RSS    Anon  Locked Mode   Mapping
0000000000400000     204       -       -       - r-x--  init
0000000000632000       4       -       -       - rw---  init
```

```
Address - Memory Address
Kbytes - Memory Size
RSS - Resident Set Size (portion of mem in RAM)
Anon - Non-shared Anonymous
Locked - locked memory
Mode - Read/Write/Executable mode
Mapping - process Mapping
```

Related Topics

show memory heap, on page 324
show processes, on page 325

show memory compare

To display details about heap memory usage for all processes on the router at different moments in time and compare the results, use the **show memory compare** command in System Admin EXEC and XR EXEC mode.

show memory compare {**start** | **end** | **report**}

Syntax Description

start	Takes the initial snapshot of heap memory usage for all processes on the router and sends the report to a temporary file named /tmp/memcmp_start.out.
end	Takes the second snapshot of heap memory usage for all processes on the router and sends the report to a temporary file named /tmp/memcmp_end.out. This snapshot is compared with the initial snapshot when displaying the heap memory usage comparison report.
report	Displays the heap memory comparison report, comparing heap memory usage between the two snapshots of heap memory usage.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **show memory compare** command to display details about the heap memory usage of all processes on the router at different moments in time and compare the results. This command is useful for detecting patterns of memory usage during events such as restarting processes or configuring interfaces.

Use the following steps to create and compare memory snapshots:

1. Enter the **show memory compare** command with the **start** keyword to take the initial snapshot of heap memory usage for all processes on the router.
2. Perform the test you want to analyze.
3. Enter the **show memory compare** command with the **end** keyword to take the snapshot of heap memory usage to be compared with the initial snapshot.
4. Enter the **show memory compare** command with the **report** keyword to display the heap memory usage comparison report.

Task ID

Task ID	Operations
basic-services	read

This example shows sample output from the **show memory compare** command with the **report** keyword:

```
sysadmin-vm:0_RP0# show memory compare start
Tue Aug  20 11:50:45.860 UTC
sysadmin-vm:0_RP0# show memory compare end
Tue Aug  20 11:50:57.311 UTC
sysadmin-vm:0_RP0# show memory compare report

PID       NAME           MEM BEFORE  MEM AFTER   DIFFERENCE  MALLOCS
-------------------------------------------------------------------------
21416  malloc_dump          34731       34731       0           0
21414  sh                   39652       39640       -12         0
21411  show_memory_common   984         984         0           0
8340   ntpd                 69033       69033       0           0
5172   inst_mgr             1800118     1800118     0           0
5166   fsdbagg              14907247    14907247    0           0
5175   fsdb_server          15475470    15475470    0           0
5177   led_mgr              3347339     3347339     0           0
5176   envmon_ui            889094      889094      0           0
5169   esdma                8954927     8954927     0           0
5164   fit_mgbl             952067      952067      0           0
5174   fab_fgid_service     9014924     9014924     0           0
5173   confd_helper         8018190     8018190     0           0
5171   debug_agent          8146830     8146830     0           0
5170   gaspp_mgbl           1285020     1285020     0           0
5168   ael_mgbl             787101      787101      0           0
5165   fpdserv              1149685     1149685     0           0
5167   ssh_key_server       661086      661086      0           0
2052   sfe_driver           35005323    35005323    0           0
2066   zen                  5083246     5083246     0           0
2017   ccc_driver           8872747     8882315     9568        1
2053   shelf_mgr            30666121    30666121    0           0
2031   esd                  6335087     6334783     -304        -2
2049   sdr_mgr              4366258     4366258     0           0
2025   dumper               616144      616144      0           0
2035   inst_agent           1820469     1820469     0           0
2062   syslogd_relay        657904      657904      0           0
2030   envmon               7853186     7853330     144         2
2041   ntp_helper           701348      701348      0           0
2539   ssh                  202441      202441      0           0
2015   bios_fpd             2950893     2950893     0           0
2042   obfl_mgr             2686006     2686006     0           0
2018   cm                   13755230    13755230    0           0
2047   obfl_show            686286      686286      0           0
2024   ds                   7826821     7826821     0           0
2060   syslogd_helper       912664      912664      0           0
2014   aaad                 804327      804327      0           0
2019   debug_client         577975      577975      0           0
2016   calv_alarm_mgr       2077250     2077250     0           0
2065   wdmon                3557984     3558056     72          1
2064   vm_manager           3149588     3149588     0           0
2037   mlap                 1520260     1520260     0           0
2056   ssh_key_client       612824      612824      0           0
2055   ship_server          778066      778066      0           0
2063   timezone_config      711110      711110      0           0
1744   pm                   7875584     7875584     0           0
```

Table 29: show memory compare report Field Descriptions

Field	Description
PID	Process ID.
name	Process name.
mem before	Heap memory usage at start (in bytes).
mem after	Heap memory usage at end (in bytes).
difference	Difference in heap memory usage (in bytes).
mallocs	Number of unfreed allocations made during the test period.
restarted	Indicates if the process was restarted during the test period.

Related Topics

show memory heap, on page 324
show processes, on page 325

show memory heap

To display information about the heap space for a process, use the **show memory heap** command in System Admin EXEC and XR EXEC mode.

show memory heap *pid*

Syntax Description

pid	Process ID

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Task ID

Task ID	Operations
basic-services	read

This example shows the sample output from the **show memory heap** command:

```
sysadmin-vm:0_RP0#show memory heap 1933
Tue Aug  20 01:06:11.282 UTC

statistics (1933:vm_manager)

Global data:
 current usage:        3147787 bytes
 Wrapper uses:          109560 bytes(hash:32728)
 total high wm:        7342424 bytes
 current objs:            2401 entry
 malloc_db/malloc:       79946 times / 79946 times
 calloc_db/calloc:        1067 times / 1067 times
 realloc_db/realloc:     26342 times / 26342 times
 realloc_null:           25644 times
 realloc_db_miss :           0 times
 realloc_relocate:          39 times
 free_db/free:          104256 times / 104722 times
 free_null:                466 times
 free_db_miss:               0 times
 error:                      0 times
```

Related Topics

show memory, on page 319

show processes

To display information about active processes, use the **show processes** command in System Admin EXEC mode.

show processes {*process-name* {[{**detail** | **run**}] **location** *node-id* | **location** *node-id*} | **aborts location** *node-id* | **all location** *node-id* | **blocked** [{*PID* | **extended** | **location** *node-id*}] | **family** [{*PID* | **location** *node-id*}] | **files** [{*PID* | **details** | **location** *node-id*}] | **location** [{**all***node-id*}] | **mandatory location** *node-id* | **memory** [{*PID* | **location** *node-id*}] | **services** {*service-name* | **active** | **all** | **run** | **standby**} **location** *node-id* | **signal** [{*PID* | **location** *node-id*}] | **startup location** *node-id* | **threadname** [{*PID* | **location** *node-id*}]}

Syntax Description

process-name	Name of the executable.
detail	Displays detailed information of the process.
run	Displays information of running processes.
location *node-id*	Displays information about the active processes from a designated node. The *node-id* argument is entered in the *rack/slot* notation.
aborts	Displays process abort information.
all	Displays summary process information for all processes.
blocked	Displays details about reply, send, and mutex blocked processes.
PID	Displays process ID.
extended	Displays blocked processes in detail.
family	Displays the process session and family information.
files	Displays information about open files and open communication channels.
mandatory	Displays process data for mandatory processes.
memory	Displays information about the text, data, and stack usage for processes.
services *service name*	Displays service data for processes.
active	Displays active services data.
standby	Displays standby services data.
signal	Displays the signal options for blocked, pending, ignored, and queued signals.

startup	Displays process data for processes created at startup.
threadname	Displays thread names.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **show processes** command to display process level information across the system.

Task ID

Task ID	Operations
basic-services	read

The **show processes** command with the **memory** keyword displays details of memory usage for a given process as shown in the following example:

```
sysadmin-vm:0_RP0# show process memory


PID         Text       Data      Stack    Dynamic Process
=========================================================
1         204 KB     204 KB     136 KB   14932 KB init
12680      16 KB      48 KB     136 KB    3852 KB sleep
12747      32 KB    8432 KB     136 KB   24776 KB cmdptywrapper
12751      12 KB    8508 KB     136 KB   74040 KB show_processes_
12754     724 KB    8456 KB     136 KB   25832 KB sh
1299      724 KB     208 KB     136 KB   11280 KB oom.sh
1305      724 KB     208 KB     136 KB   11280 KB oom.sh
1443      476 KB     540 KB     136 KB   14984 KB dhclient
1486       28 KB     188 KB     136 KB    6104 KB syslogd
1490       20 KB    3056 KB     136 KB    6864 KB klogd
1545      224 KB     204 KB     136 KB   13172 KB lldpad
1557      308 KB     204 KB     136 KB   12844 KB dbus-daemon
1588      412 KB     444 KB     136 KB   23252 KB sshd
1593      412 KB     444 KB     136 KB   23252 KB sshd
1602      192 KB     372 KB     136 KB   11120 KB xinetd
1618       40 KB     692 KB     524 KB    7008 KB crond
1630      792 KB   49720 KB     136 KB   83164 KB libvirtd
1711      116 KB     636 KB     136 KB    4540 KB udevd
1712      116 KB     636 KB     136 KB    4540 KB udevd
1722      324 KB   16164 KB     136 KB  148164 KB pm
```

Table 30: show processes memory Field Descriptions

Field	Description
PID	Process ID.

Field	Description
Text	Size of text region (process executable).
Data	Size of data region (initialized and uninitialized variables).
Stack	Size of process stack.
Dynamic	Size of dynamically allocated memory.
Process	Process name.

Related Topics

monitor processes
monitor threads, on page 303

Secure Domain Router Commands

Secure Domain Routers (SDRs) are a means of dividing a single physical system into multiple logically separated routers. SDRs are isolated from each other in terms of their resources, performance, and availability. On NCS-6008 single-chassis, multiple SDRs can be created and each SDR shall be independent of each other. They can be independently upgraded or downgraded and are capable of defining the SDR boundary at the line card level.

For detailed information about secure domain router concepts, configuration tasks, and examples, see the *Configuring Secure Domain Routers on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

- console attach-sdr location, on page 330
- placement reoptimize, on page 332
- sdr, on page 333
- sdr location, on page 335
- sdr resources, on page 336
- sdr default-sdr re_pair, on page 338
- sdr default-sdr pairing-mode inter-rack, on page 339
- sdr default-sdr pairing-mode intra-rack, on page 340
- sh placement reoptimize, on page 341
- show sdr, on page 342
- show sdr default-sdr pairing, on page 345
- show sdr-manager trace, on page 346

console attach-sdr location

To create console access to the named-SDRs, use the **console attach-sdr location** command in System Admin Config mode.

console attach-sdr location *node-id***tty name** *tty-name***sdr- name** *sdr- name*

Syntax Description

console attach-sdr location *node-id*	Specifies the location of the RP. **Note** XR VMs RP can be either RP0 or RP1 based on the RP on which XR VM is active gets created first, similar to default-SDR.
tty name *tty-name*	Specifies the name of tty. It can either be console1 or console2.
sdr- name *sdr- name*	Specifies the named-SDR that can be accessed through console. **Note** The consoles are per node base. They can be assigned to RP or standby RP. With console port assigned to standby RP, the standby console cannot be used for command input, similar to default-SDR.

Command Default

None

Command Modes

System Admin Config mode

Command History

Release	Modification
Release 6.1.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

- With named-SDRs, you can either use console1 or console2 of RP to access XR VM. You can connect up to two named-SDRs at any given time.
- Console attach CLI needs to be configured for both Active and Standby RPs.
- On redundancy switchover, access is seamlessly transferred to the new RP. You need to connect to the new RPs console (similar to default-SDR).
- When all the VMs are created, you need to issue console attach-sdr CLI to get console access to the XR console.

Task ID

Task ID	Operations
system	read, write

Example

The following example shows how to configure console access to named-SDR.

```
sysadmin-vm:0_RP0# configure
sysadmin-vm:0_RP0(config)# console attach-sdr location 0/RP0 tty-name console1 sdr-name
sdr2
sysadmin-vm:0_RP0(config)# console attach-sdr location 0/RP1 tty-name console1 sdr-name
sdr2
sysadmin-vm:0_RP0(config)# commit
```

placement reoptimize

To reoptimize the placement of processes to provide high availability, use the **placement reoptimize** command in the System Admin EXEC mode.

placement reoptimze

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

None

This example shows how to initiate a placement reoptimization of processes:

```
sysadmin-vm:0_RP0#placement reoptimize
 Mon Jun 26 21:50:26.030 UTC
--------------------------------------------------------------------------------
Group-Name          Current-Placement             Reoptimized-Placement
--------------------------------------------------------------------------------
central-services    0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v4-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
netmgmt             1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
mcast-routing       0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v6-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
Group_0_1           0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
Group_0_0           1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
--------------------------------------------------------------------------------
Do you want to proceed with the reoptimization[y/n]y
Triggering reoptimize
Migration running in the background
Please don't trigger one more migration
```

sdr

To create a secure domain router (SDR) and to enter SDR configuration mode, use the **sdr** command in System Admin Config mode. To remove a secure domain router from the configuration, use the **no** form of this command.

sdr *sdr-name*
no sdr *sdr-name*

Syntax Description

sdr-name	Name of the SDR to be created or modified.

Command Default

The system comes configured as a single secure domain router known as the *default-SDR*.

Command Modes

System Admin Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 6.1.1	Support for named-SDRs was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **sdr** command to create an SDR or modify an existing SDR.

Note The *sdr-name* argument creates an SDR if the SDR specified for the *sdr-name* argument does not exist.

By default, a router running Cisco IOS XR software contains one SDR, the default-SDR. You can create multiple SDRs by deleting the default-SDR.

Use the **no** form of the command to remove a the SDR configuration. When an SDR is removed from the router configuration, all nodes included in the SDR configuration are returned to the default SDR inventory.

Maximum Number of SDR Configurations

A maximum of three named-SDRs can be configured.

Task ID

Task ID	Operations
system	read, write

The following example shows how to delete the default-SDR.

```
sysadmin-vm:0_RP0# configure
Thu Jun  25 09:36:03.496 UTC
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# no sdr default-sdr
sysadmin-vm:0_RP0(config)# commit
```

The following example shows how enter SDR configuration mode to configure an SDR.

```
sysadmin-vm:0_RP0# configure
sysadmin-vm:0_RP0(config)# sdr sdr1
sysadmin-vm:0_RP0(config-sdr-sdr1)#
```

sdr location

To reload, start, or shutdown a secure domain router (SDR), use the **sdr location** command in the System Admin EXEC mode.

sdr *sdr-name* **location** {*node-id* | **all**} {**reload** [{**coredump** | **force**}] | **shut** | **start**}

Syntax Description

sdr-name	Name of the SDR, **default-sdr** or **named-SDR** .
node-id	Selects the target location. The *node-id* is expressed in the rack/slot notation.
all	Selects all the nodes.
reload	Reloads the XR VM on the node.
coredump	Performs the VM core dump and then reloads the SDR.
force	Forces shutdown and does not wait for an orderly system shutdown.
shut	Shuts down the XR VM on the node.
start	Starts the XR VM on the node.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

None

This example shows how to reload the SDR:

```
sysadmin-vm:0_RP0#sdr default-sdr location 0/1 reload
```

sdr resources

To allocate resources for a secure domain router (SDR), use the **sdr resources** command in System Admin Config mode. To remove the allocated resources, use the **no** form of this command.

sdr {*sdr-name* | **default-sdr**} **resources** {**card-type** {**lc** | **RP**} [{**vm-cpu** *num-of-cpus* | **vm-memory** *memory-size* }] | **disk-space-size** *disk-space-size* | **fgid** *fgid* | **mgmt_ext_vlan** *ext-vlan-id*}

Syntax Description

sdr-name	Specifies the name of the SDR. Permitted values are 1 to 30 characters (0-9,a-z,A-Z,-,_).
default-sdr	Specifies the default SDR.
card-type	Specifies the type of the card, that is RP or LC.
vm-cpu *num-of-cpus*	Specifies the number of VM CPUs.
vm-memory *memory-size*	Speicifies the VM memory size in gigabytes.
disk-space-size *disk-space-size*	Specifies the size of the SDR disk space, as an unsigned integer.
fgid *fgid*	Specifies the fragment ID of the SDR, as an unsigned integer ranging from 25000 to 524288.
mgmt_ext_vlan *ext-vlan-id*	Specifies the management external VLAN for the SDR.

Command Default

None

Command Modes

System Admin Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

This command must be used to fine tune the physical memory resources of each Cisco ASR 9000 High Density 100GE Ethernet line card in order to achieve full scale with Cisco IOS XR 64-bit BNG.

This command enforces to reboot the LC XR-VMs to adjust the requested resources like VM memory.

Task ID

Task ID	Operation
system	read

This example shows how to fine tune the memory for LC XR-VM by configuring resources for secure domain router:

```
RP/0/RP0/CPU0:router#admin
sysadmin-vm:0_RSP1# config
```

```
sysadmin-vm:0_RSP1(config)# sdr default-sdr resources card-type lc vm-memory 21
```

sdr default-sdr re_pair

To initiate re-pairing of RPs in the currently defined secure domain routers (SDRs), use the **sdr default-sdr re_pair** command in the System Admin EXEC mode.

```
sdr   default-sdrre_pair
```

Syntax Description

default-sdr	Shows the details of the default SDR.
re_pair	Activates the re-pairing of RPs in the defined SDR.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

None

This example shows how to display the pairing of the default SDR:

```
sysadmin-vm:0_RP0#sdr default-sdr re_pair
 Fri May 19 21:22:36.625 UTC
Current Configuration
    0/RP0 1/RP1
    1/RP0 2/RP1
    2/RP0 0/RP1
Re_Paired Configuration
    0/RP0 1/RP1
    1/RP0 0/RP1
Would you like to proceed ? [yes/no]:  yes
Proceeding with action
```

sdr default-sdr pairing-mode inter-rack

To enable pairing RPs between racks in a diasy chain algorithm defined secure domain routers (SDRs), use the **sdr default-sdr pairing-mode inter-rack** command in the System Admin EXEC mode. The inter-rack mode of pairing provides high availability against rack failures.

sdr`default-sdr` **pairing-modeinter-rack**

Syntax Description

default-sdr	Shows the details of the default SDR.
pairing-mode	Specifies the pairing mode of RPs.
inter-rack	Enables the pairing of RPs between racks in a configuration.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

None

This example shows how to enable inter-rack pairing:

```
sysadmin-vm:0_RP0#sdr default-sdr pairing-mode inter-rack
```

sdr default-sdr pairing-mode intra-rack

To enable pairing of RPs within a rack, use the **sdr default-sdr pairing-mode intra-rack** command in the System Admin EXEC mode. The intra-rack mode of pairing is the defaut pairing mechanism as defined in the SDR.

sdr default-sdrpairing-modeintra-rack

Syntax Description

default-sdr	Shows the details of the default SDR.
pairing-mode	Specifies the pairing mode of RPs.
intra-rack	Enables the pairing of RPs within a rack in a configuration.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

None

This example shows how to enable inter-rack pairing:

```
sysadmin-vm:0_RP0#sdr default-sdr pairing-mode intra-rack
```

sh placement reoptimize

To show the predictions from reoptimizing the placement of processes to provide high availability, use the **sh placement reoptimize** command in the System Admin EXEC mode.

shplacement reoptimze

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

None

This example shows how to see the predictions for a placement reoptimization of processes:

```
sysadmin-vm:0_RP0#sh placement reoptimize
Mon Jun 26 21:49:24.504 UTC
------------------------------------------------------------------------------
Group-Name          Current-Placement             Reoptimized-Placement
------------------------------------------------------------------------------
central-services    0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v4-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
netmgmt             1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
mcast-routing       0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v6-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
Group_0_1           0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
Group_0_0           1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
```

show sdr

To display information about the currently defined secure domain routers (SDRs), pairing details, and reboot history, use the **show sdr location** command in the System Admin EXEC mode.

show sdr [**sdr-name** `detail` [{**location** [*node-id*] | **pairing** | **reboot-history location** [*node-id*]}]]

Syntax Description

sdr-name	Name of the SDR, **default-sdr** or **named-SDR**.
location *node-id*	Selects the target location. The *node-id* is expressed in the *rack/slot* notation.
pairing	Displays the detailed information of the SDR.
pairing	Displays the SDR pairing information.
reboot-history	Displays the reboot history of the SDR.

Command Default

Displays all SDRs in the system.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

This example shows how to display the detailed information of the SDR:

```
sysadmin-vm:0_RP0# show sdr Internet-SDR detail
Sat Aug  27 06:05:36.757 UTC
------SDR Detail at location 0/RP0/VM1------
 SDR Id                          2
 IP Address of VM                192.0.0.4
 MAC address of VM               64:F6:9D:78:FD:36
 Boot Partition                  /dev/panini_vol_grp/xr_lv0
 Data Partition                  /dev/pci_disk1/xr_data_lv0
 Big Disk Partition              /dev/pci_disk1/ssd_disk1_xr_2
 VM Id                           1
 VM CPUs                         4
 VM Memory[in MB]                11264
 Card Type                       RP_Card
 Card Serial                     SAL19058TGE
 Rack Type                       Line_Card_Controller
 Chassis Serial                  FLM184073K4
 Hardware Version                0.4
 Management External VLAN        12
 VM State                        RUNNING
 Start Time                      "08/11/2016 00:33:12"
 Reboot Count(Since VM Carving)  1
 Reboot Count(Since Card Reload) 1
               08/11/2016 00:33:12 FIRST_BOOT
------SDR Detail at location 0/RP1/VM1------
```

```
 SDR Id                          2
 IP Address of VM                192.0.4.4
 MAC address of VM               4C:4E:35:B6:94:BC
 Boot Partition                  /dev/panini_vol_grp/xr_lv0
 Data Partition                  /dev/pci_disk1/xr_data_lv0
 Big Disk Partition              /dev/pci_disk1/ssd_disk1_xr_2
 VM Id                           1
 VM CPUs                         4
 VM Memory[in MB]                11264
 Card Type                       RP_Card
 Card Serial                     SAL1830XFD5
 Rack Type                       Line_Card_Controller
 Chassis Serial                  FLM184073K4
 Hardware Version                0.4
 Management External VLAN        12
 VM State                        RUNNING
 Start Time                      "08/11/2016 00:33:01"
 Reboot Count(Since VM Carving)  1
 Reboot Count(Since Card Reload) 1
               08/11/2016 00:33:01 FIRST_BOOT
------SDR Detail at location 0/6/VM1------
 SDR Id                          2
 IP Address of VM                192.0.88.3
 MAC address of VM               E2:3B:46:4F:8D:05
 Boot Partition                  /dev/panini_vol_grp/xr_lv0
 Data Partition                  /dev/panini_vol_grp/xr_data_lv0
 Big Disk Partition              (null)
 VM Id                           1
 VM CPUs                         3
 VM Memory[in MB]                6383
 Card Type                       LC_Card
 Card Serial                     SAD161300T5
 Rack Type                       Line_Card_Controller
 Chassis Serial                  FLM184073K4
 Hardware Version                0.2
 Management External VLAN        12
 VM State                        RUNNING
 Start Time                      "08/11/2016 00:32:48"
 Reboot Count(Since VM Carving)  1
 Reboot Count(Since Card Reload) 1
               08/11/2016 00:32:48 FIRST_BOOT
```

This example shows how to display the SDR pairing information:

```
sysadmin-vm:0_RP0# show sdr Internet-SDR pairing
Sat Aug  27 06:01:08.174 UTC
 Pairing Mode  AUTOMATIC
 SDR Lead
   Node 0 0/RP0
   Node 1 0/RP1
 Pairs
   Pair Name Pair0
    Node 0   0/RP0
    Node 1   0/RP1
```

This example shows the output of the **show sdr** command:

```
sysadmin-vm:0_RP0# show sdr
Sat Aug  27 06:02:34.910 UTC

SDR: Internet-SDR
Location     IP Address      Status           Boot Count  Time Started
-------------------------------------------------------------------------------
0/RP0/VM1    192.0.0.4       RUNNING          1           08/11/2016 00:33:12
```

```
0/RP1/VM1    192.0.4.4       RUNNING          1           08/11/2016 00:33:01
0/6/VM1      192.0.88.3      RUNNING          1           08/11/2016 00:32:48

SDR: P-SDR
Location     IP Address      Status           Boot Count  Time Started
--------------------------------------------------------------------------------
0/RP0/VM2    192.0.0.6       RUNNING          2           08/11/2016 03:24:43
0/RP1/VM2    192.0.4.6       RUNNING          2           08/11/2016 03:24:32
0/1/VM1      192.0.68.3      RUNNING          2           08/11/2016 03:25:26

SDR: VRFPE-SDR1
Location     IP Address      Status           Boot Count  Time Started
--------------------------------------------------------------------------------
0/RP0/VM3    192.0.0.8       RUNNING          2           08/11/2016 02:32:15
0/RP1/VM3    192.0.4.8       RUNNING          2           08/11/2016 02:32:23
0/0/VM1      192.0.64.3      RUNNING          1           08/18/2016 22:33:52
```

This example shows the output of the show sdr <sdr-name> reboot-history

```
sysadmin-vm:0_RP0# show sdr Internet-SDR reboot-history
Sat Aug  27 06:06:42.315 UTC

             Reboots
             Since
Location     Created   Reason
-----------------------------------------------------------------------
0/RP0/VM1    1
                       08/11/2016 00:33:12 FIRST_BOOT
0/RP1/VM1    1
                       08/11/2016 00:33:01 FIRST_BOOT
0/6/VM1      1
                       08/11/2016 00:32:48 FIRST_BOOT
```

show sdr default-sdr pairing

To display information about the pairing details of the currently defined secure domain routers (SDRs), use the **show sdr default-sdr pairing** command in the System Admin EXEC mode.

showsdr **default-sdrpairing**

Syntax Description

default-sdr	Shows the details of the default SDR.
pairing	Displays the pairing of RPS in the SDR.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

None

This example shows how to display the pairing of the default SDR:

```
sysadmin-vm:0_RP0#show sdr default-sdr pairing
 Fri May 19 21:23:039.938 UTC
 Pairing Mode  INTER-RACK
 SDR Lead
   Node 0 0/RP0
   Node 1 1/RP1
 Pairs
   Pair Name Pair0
    Node 0   0/RP0
    Node 1   1/RP1
 Pairs
   Pair Name Pair1
    Node 0   1/RP0
    Node 1   0/RP1
```

show sdr-manager trace

To display SDR manager trace details, use the **show sdr-manager trace** command in the System Admin EXEC mode.

show sdr-manager trace {**all** *trace-name*} **location** *node-id* [{**all** *trace-attribute*}]

Syntax Description

trace-name	Trace buffer name.
location *node-id*	Specifies the target location. The *node-id* argument is expressed in the *rack/slot* notation.
trace-attributes	Trace attribute.
all	Displays all the details.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

This command displays the SDR manager debug traces that are meant only for diagnostics.

This example shows how to display the SDR manager trace details:

```
sysadmin-vm:0_RP0#show sdr-manager trace all location 0/0 timestamp

Fri Aug  9  07:02:28.644 UTC
06.55.47.185784448:1376031347185784662:sdr_mgr SDR MGR started
06.55.47.187332096:1376031347187332362:  @msc_entity id="0/19581" display_name="sdr_mgr"
06.55.47.187343744:1376031347187344066:@msc_event entity_id="0/19581/19581"
time="1376031347187344066" label="requesting connection to syslog (CAPI hdl=0x1bcad60, CIPC
 hdl = 0x1bcb0a0)" type="Connection" completed="false"
06.55.47.187395968:1376031347187396272:DS handle 0x1bcad60 instantiated for syslog client
handle
06.55.47.187745024:1376031347187745236:  @msc_entity id="0/19581" display_name="sdr_mgr"
06.55.47.188629504:1376031347188629812:@msc_event entity_id="0/19581/19581"
time="1376031347188629812"
label="requesting connection to calvados_ds (CAPI hdl=0x1bee4a0, CIPC hdl = 0x1bee8d0)"
type="Connection" completed="false"
06.55.47.188833024:1376031347188833246:@msc_event entity_id="0/19581/19581"
time="1376031347188833246" label="connecting to calvados_ds with endpoint (0x7f000001, 7400)

hdl=0x0x1bee4a0)" type="Connection" completed="false"
@msc_source pairing_id="0/19581/con_0x1bee4a0" type="Lane"
06.55.47.189353600:1376031347189353766:CIPC:CONN (hdl=0x1bee8d0):cipc_connect():
invoked on endpoint (127.0.0.1, 7400)
06.55.47.189588736:1376031347189588924:CIPC:INFO (hdl=0x1bee8d0):socket_connect():
async socket connection in progress
```

```
06.55.47.190383488:1376031347190383718:SMIL: set 0x1afa8d0 created
06.55.47.190388352:1376031347190388492:DEBUG: sdr_main_fsa_init
```

Simple Network Management Protocol (SNMP) Server Commands

This chapter describes the Cisco IOS XR software commands used to configure and monitor the Simple Network Management Protocol (SNMP) for network monitoring and management.

For detailed information about SNMP concepts, configuration tasks, and examples, see the *Implementing SNMP on Cisco IOS XR Software* configuration module in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

Note The **snmp-server** commands enable SNMP on Management Ethernet interfaces by default. For information about how to enable SNMP server support on other inband interfaces, see the *Implementing Management Plane Protection on Cisco IOS XR Software* module in *System Security Configuration Guide for Cisco NCS 6000 Series Routers*.

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add (bulkstat object)

To add a MIB object to a Simple Network Management Protocol (SNMP) bulk statistics object list, use the **add** command in bulk statistics object list configuration mode. To remove a MIB object from an SNMP bulk statistics object list, use the **no** form of this command.

add {*object-nameOID*}
no add {*object-nameOID*}

Syntax Description

object-name	Name of the MIB object to add to the list. Object names are limited to those with mappings shown in the **show snmp mib object-name** command.
OID	Object identifier (OID) of the MIB object to add to the list.

Command Default

No MIB objects are configured for an object list.

Command Modes

Bulk statistics object list configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All object names and OIDs in a single object list should belong to the same MIB index, but the objects need not belong to the same MIB table. For example, it is possible to group ifInoctets and a CISCO-IF-EXTENSION-MIB object in the same schema because the containing tables are indexed by the ifIndex (in the IF-MIB).

The **add** command should be repeated as necessary until all MIB objects have been added to the object list.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to add various MIB objects to an object list.

```
RP/0/RP0/CPU0:router(config-bulk-objects)# add 1.3.6.1.2.1.2.2.1.11
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifAdminStatus
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifDescr
```

Related Topics

show snmp mib, on page 387

buffer-size

To configure a maximum buffer size for the transfer of bulk statistics files, use the **buffer-size** command in bulk statistics transfer configuration mode. To remove a previously configured buffer size from the configuration, use the **no** form of this command.

buffer-size *bytes*
no buffer-size [*bytes*]

Syntax Description

bytes	Size of the bulk statistics transfer buffer, in bytes. The valid range is from 1024 to 2147483647. The default is 2048.

Command Default

The default bulk statistics transfer buffer is 2048 bytes.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A configured buffer size limit is available primarily as a safety feature. Normal bulk statistics files should not generally meet or exceed the default value while being transferred.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to set the buffer size to 1024 bytes:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# buffer-size 1024
```

clear snmp counters

To clear the Simple Network Management Protocol (SNMP) packet statistics shown by the **show snmp** command, use the **clear snmp counters** command in XR EXEC mode.

clear snmp counters

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear snmp counters** command provides the ability to clear all SNMP counters used in the **show snmp** command without restarting any processes.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to clear the SNMP counters:

```
RP/0/RP0/CPU0:router# clear snmp counters
```

Related Topics

show snmp, on page 374

enable (bulkstat)

To begin the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **enable** command in bulk statistics transfer configuration mode. To disable the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **no** form of this command.

enable
no enable

Syntax Description

This command has no keywords or arguments.

Command Default

Bulk statistics transfer is disabled.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Specific bulk statistics configurations are identified with a name, as specified in the **snmp-server mib bulkstat transfer-id** command. The **enable** command begins the periodic MIB data collection and transfer process.

Collection (and subsequent file transfer) starts only if this command is used. Conversely, the **no enable** command stops the collection process. Subsequently, issuing the **enable** command starts the operations again.

Each time the collection process is started using the **enable** command, data is collected into a new bulk statistics file. When the **no enable** command is used, the transfer process for any collected data immediately begins (in other words, the existing bulk statistics file are transferred to the specified management station).

To successfully enable a bulk statistics configuration, at least one schema with a non-zero number of objects must be configured.

Task ID

Task ID	Operation
snmp	read, write

The following example shows the bulk statistics transfer configuration named bulkstat1 as enabled:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# enable
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

show snmp mib bulkstat transfer, on page 390
snmp-server mib bulkstat transfer-id, on page 424

format (bulkstat)

To specify the format to be used for the bulk statistics data file, use the **format** command in bulk statistics transfer configuration mode. To disable a previously configured format specification and return to the default, use the **no** form of this command.

format {**bulkBinary** | **bulkASCII** | **schemaASCII**}
no format [{**bulkBinary** | **bulkASCII** | **schemaASCII**}]

Syntax Description

bulkBinary	Binary format.
bulkASCII	ASCII format.
schemaASCII	A human-readable ASCII format that contains additional bulk statistics schema tags. This is the default.

Command Default

The default bulk statistics transfer format is schemaASCII

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The bulk statistics data file (VFile) contains two types of fields: tags and data. Tags are used to set off data to distinguish fields of the file. All other information is in data fields.

Transfers can only be performed using schemaASCII format.

For each transfer/schema pair there is a header with tags for each object collected, followed by the collected data. For example, if the transfer name is T1 and the schemas in it are S1 (which collects ifInOctets and ifOutOctets) and S2 (which collects ifInUcastPkts and ifInDiscards). Then the output file looks like this:

```
Schema-def cempt1.cempWild "%u, %s, %s, %d" Epochtime instanceoid
1.3.6.1.4.1.9.9.221.1.1.1.1.3 1.3.6.1.4.1.9.9.221.1.1.1.1.2
cempt1.cempWild: 1339491515, 8695772.1, processor, 2
cempt1.cempWild: 1339491515, 8695772.2, reserved, 11
cempt1.cempWild: 1339491515, 8695772.3, image, 12
cempt1.cempWild: 1339491575, 8695772.1, processor, 2
cempt1.cempWild: 1339491575, 8695772.2, reserved, 11
cempt1.cempWild: 1339491575, 8695772.3, image, 12
Schema-def cempt1.cempRepeat "%u, %s, %s, %d" Epochtime instanceoid
1.3.6.1.4.1.9.9.221.1.1.1.1.3 1.3.6.1.4.1.9.9.221.1.1.1.1.2
cempt1.cempRepeat: 1339491515, 8695772.1, processor, 2
cempt1.cempRepeat: 1339491515, 8695772.2, reserved, 11
cempt1.cempRepeat: 1339491515, 8695772.3, image, 12
cempt1.cempRepeat: 1339491515, 26932192.1, processor, 2
cempt1.cempRepeat: 1339491515, 26932192.2, reserved, 11
cempt1.cempRepeat: 1339491515, 26932192.3, image, 12
```

```
cempt1.cempRepeat: 1339491515, 35271015.1, processor, 2
cempt1.cempRepeat: 1339491515, 35271015.2, reserved, 11
cempt1.cempRepeat: 1339491515, 35271015.3, image, 12
cempt1.cempRepeat: 1339491515, 36631989.1, processor, 2
cempt1.cempRepeat: 1339491515, 36631989.2, reserved, 11
cempt1.cempRepeat: 1339491515, 36631989.3, image, 12
cempt1.cempRepeat: 1339491515, 52690955.1, processor, 2
cempt1.cempRepeat: 1339491515, 52690955.2, reserved, 11
cempt1.cempRepeat: 1339491515, 52690955.3, image, 12
```

Task ID

Task ID	Operation
snmp	read, write

This example shows how to specify the data format:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# format schemaASCII
```

Related Topics

show snmp mib bulkstat transfer, on page 390
snmp-server mib bulkstat transfer-id, on page 424

index persistence

To enable index persistence on an Simple Network Management Protocol (SNMP) interface, use the **index persistence** command in SNMP interface configuration mode. To restore the default conditions with respect to this command, use the **no** form of this command.

index persistence
no index persistence

Syntax Description

This command has no keywords or arguments.

Command Default

Index persistence is disabled.

Command Modes

SNMP interface configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **index persistence** command to enable ifIndex persistence for individual entries (corresponding to individual interfaces) in the ifIndex table of the IF-MIB. IfIndex persistence retains the mapping between the ifName object values and the ifIndex object values (generated from the IF-MIB) across reboots, allowing for consistent identification of specific interfaces using SNMP.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to assign ifIndex persistence on interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface tengige 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)# index persistence
```

Related Topics

snmp-server engineid local, on page 407
snmp-server ifindex persist
snmp-server interface

instance (bulkstat schema)

To configure the MIB object instances to be used in a Simple Network Management Protocol (SNMP) bulk statistics schema, use the **instance** command in bulk statistics configuration mode. To remove the instance definition, use the **no** form of this command.

instance {**exact** | **wild** } {**interface** *interface-id* [**sub-if**] | **oid** *oid*}
no instance

Syntax Description

exact	Specifies that the specified interface or object identifier (OID), when appended to the object list, is the complete OID to be used in this schema.
wild	Specifies that all instances that fall within the the specified OID or interface are included in this schema.
interface *interface-id*	Specifies an interface to be used to define the schema instance.
[**sub-if**]	(Optional) Specifies that the object instances are polled for all subinterfaces of the specified interface in addition to the object instances for the main interface.
oid *oid*	Specifies an OID to be used to define the schema instance.

Command Default

No instances are configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **instance** command specifies the instance information for objects in the schema being configured. The specific instances of MIB objects for which data is collected are determined by appending the value of the instance command to the objects specified in the associated object list. In other words, the schema object-list when combined with the schema instance specifies a complete MIB object identifier.

The **instance exact** command indicates that the specified instance, when appended to the object list, is the complete OID.

The **instance wild** command indicates that all subindices of the specified OID belong to this schema. For example, the command `instance wild oid 1` includes all subindices of the instance, such as 1.1, 1.2 and so on. It does not include other instances that start with the number 1, such as 10 and 11.

Instead of specifying an OID, you can specify a specific interface. The **interface** *interface-id* keyword and argument allow you to specify an interface name and number instead of specifying the ifIndex OID for the interface.

The optional **sub-if** keyword, when added after specifying an interface, includes the ifIndexes for all subinterfaces of the interface you specified.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following examples show two different ways to configure an instance.

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance wild oid 1
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance exact interface FastEthernet 0/1.25
```

Related Topics

instance range, on page 362
instance repetition, on page 363
snmp-server mib bulkstat schema, on page 422

instance range

To specify a range of instances for objects in a schema, use the **instance** command in bulk statistics schema configuration mode. To remove the configured instance information, use the **no** form of this command.

instance range start *start-oid* **end** *end-oid*
no instance

Syntax Description

start *start-oid*	Specifies the first OID value of a range of values.
end *end-oid*	Specifies the last OID value of a range of values.

Command Default

No instances are configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a range of instances.

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance range start 1 end 2
```

Related Topics

instance (bulkstat schema), on page 360
snmp-server mib bulkstat schema, on page 422

instance repetition

To configure bulk statistics data collection to begin at a particular instance of a MIB object and to repeat for a given number of instances , use the **instance repetition** command in bulk statistics schema configuration mode. To delete a previously configured repetition of instances, use the **no** form of this command.

instance repetition *oid-instance* **max** *repeat-number*
no instance

Syntax Description

oid-instance	Object ID of the instance to be monitored.
max *repeat-number*	Specifies the number of times the instance should repeat.

Command Default

No instance repetition is configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **instance repetition** command is used to configure data collection to repeat for a certain number of instances of a MIB object.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following example configures 4 repetitions of the OID of value 1.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifOutOctets
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifInOctets

RP/0/RP0/CPU0:router(config-bulk-objects)# exit
RP/0/RP0/CPU0:router(config)# snmp mib-server bulkstat schema IFMIB

RP/0/RP0/CPU0:router(config-bulk-sc)# object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 1
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance repetition 1 max 4
```

Related Topics

instance (bulkstat schema), on page 360
instance range, on page 362
snmp-server mib bulkstat schema, on page 422

notification linkupdown

To enable or disable linkUp and linkDown trap notifications on a Simple Network Management Protocol (SNMP) interface, use the **notification linkupdown** command in SNMP interface configuration mode. To revert to the default setting, use the **no** form of this command.

notification linkupdown disable
no notification linkupdown disable

Syntax Description

disable	Disables linkUp and linkDown trap notifications on an SNMP interface.

Syntax Description

This command has no keywords or arguments.

Command Default

By default, for all main interfaces the linkUp and linkDown trap notifications are enabled; for all subinterfaces they are disabled.

Command Modes

SNMP interface configuration

SNMP interface subset configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Enabling of linkUp and linkDown notifications is performed globally using the **snmp-server traps snmp** command. Issue the **notification linkupdown** command to disable linkUp and linkDown notifications on an interface.

Use the **no** form of this command to enable linkUp and linkDown notifications on an interface, if linkUp and linkDown notifications have been disabled.

You can also use the **snmp-server interface subset** command to enable or disable groups of interfaces.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to disable linkUp and linkDown trap notifications on interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface tengige 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)# notification linkupdown disable
```

Related Topics

snmp-server engineid local, on page 407
snmp-server ifindex persist
snmp-server interface
snmp-server interface subset
snmp-server traps snmp, on page 446

object-list

To specify the bulk statistics object list to be used in the bulk statistics schema, use the **object-list** command in bulk statistics schema configuration mode. To remove an object list from the schema, use the **no** form of this command.

object-list *list-name*
no object-list [*list-name*]

Syntax Description

list-name	Name of a previously configured bulk statistics object list.

Command Default

No bulk statistics object list is specified.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command associates a bulk statistics object list with the schema being configured. The object list should contain a list of MIB objects to be monitored. Only one object list can be specified for each schema. Use the **snmp-server mib bulkstat object-list** command to create an object list.

Task ID

Task ID	Operation
snmp	read, write

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat schema schema1
RP/0/RP0/CPU0:router(config-bulk-sc)# object-list obj1
```

Related Topics

show snmp mib bulkstat transfer, on page 390
snmp-server mib bulkstat schema, on page 422
snmp-server mib bulkstat object-list, on page 421

poll-interval

To configure the polling interval for a bulk statistics schema, use the **poll-interval** command in bulk statistics schema configuration mode. To remove a previously configured polling interval, use the **no** form of this command.

poll-interval *minutes*
no poll-interval

Syntax Description

minutes	Integer in the range from 1 to 20000 that specifies, in minutes, the polling interval of data for this schema. The default is 5.

Command Default

Object instances are polled once every five minutes.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **poll-interval** command sets how often the MIB instances specified by the schema and associated object list are to be polled. Collected data is stored in the local bulk statistics file for later transfer.

Task ID

Task ID	Operation
snmp	read, write

Related Topics

snmp-server mib bulkstat schema, on page 422

retain

To configure the retention interval for bulk statistics files, use the **retain** command in bulk statistics transfer configuration mode. To remove a previously configured retention interval from the configuration, use the **no** form of this command.

retain *minutes*
no retain [*minutes*]

Syntax Description

minutes	Length of time, in minutes, that the local bulk statistics file should be kept in system memory (the retention interval). The valid range is 0 to 20000. The default is 0.

Command Default

The bulk statistics file retention interval is 0 minutes.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **retain** command specifies how long the bulk statistics file should be kept in system memory, in minutes, after the completion of the collection interval and a transmission attempt is made. The default value of zero (0) indicates that the file is deleted immediately from local memory after a successful transfer.

If the **retry** command is used, you should configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries are attempted once every 5 minutes. Therefore, if the **retain** command is not configured (retain default is 0), no retries are attempted.

Note Once a successful transmission has occurred the bulk file is not retained regardless of the retain time.

Task ID

Task ID	Operation
snmp	read, write

In the following example, the bulk statistics transfer retention interval is set to 10 minutes:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 2
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 10
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

retry, on page 371
show snmp mib bulkstat transfer, on page 390
snmp-server mib bulkstat transfer-id, on page 424

retry

To configure the number of retries that should be attempted for a bulk statistics file transfer, use the **retry** command in bulk statistics transfer configuration mode. To return the number of bulk statistics retries to the default, use the **no** form of this command.

retry *number*
no retry [*number*]

Syntax Description

number	Number of transmission retries. The valid range is from 0 to 100.

Command Default

No retry attempts are made.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If an attempt to send the bulk statistics file fails, the system can be configured to attempt to send the file again using the **retry** command. One retry includes an attempt first to the primary destination and then, if the transmission fails, to the secondary location; for example, if the retry value is 1, an attempt will be made first to the primary URL, then to the secondary URL, then to the primary URL again, and then to the secondary URL again.

If the **retry** command is used, you should also use the **retain** command to configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries are attempted once every 5 minutes. Therefore, if the **retain** command is not configured (or the **retain 0** command is used) no retries are attempted.

Task ID

Task ID	Operation
snmp	read, write

In the following example, the number of retries for the bulk statistics transfer is set to 2:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 2
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 10
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

retain, on page 369
show snmp mib bulkstat transfer, on page 390
snmp-server mib bulkstat transfer-id, on page 424

schema

To specify the bulk statistics schema to be used in a specific bulk statistics transfer configuration, use the **schema** command in bulk statistics transfer configuration mode. To remove a previously configured schema from a specific bulk statistics transfer configuration, use the **no** form of this command.

schema *schema-name*
no schema [*schema-name*]

Syntax Description

schema-name	Name of a previously configured bulk statistics schema.

Command Default

No bulk statistics schema is specified.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The schema must be previously defined using the **snmp-server mib bulkstat schema** command.

Repeat the **schema** command as desired for a specific bulk statistics transfer configuration. Multiple schemas can be associated with a single transfer configuration; all collected data will be in a single bulk statistics data file (VFile).

Task ID

Task ID	Operation
snmp	read, write

This example adds three different schemas to a bulk statistics transfer configuration:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-CAR
RP/0/RP0/CPU0:router(config-bulk-tr)# schema Ethernet2/1-IFMIB
```

Related Topics

show snmp mib bulkstat transfer, on page 390
snmp-server mib bulkstat schema, on page 422

show snmp

To display the status of Simple Network Management Protocol (SNMP) communications, use the **show snmp** command in

XR EXEC

mode.

show snmp

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the `show snmp` command to show counter information for SNMP operations. It also displays the chassis ID string defined with the **snmp-server chassis-id** command.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the `show snmp` command:

```
RP/0/RP0/CPU0:router# show snmp

  Chassis: 01506199
  37 SNMP packets input
  0 Bad SNMP version errors
  4 Unknown community name
  0 Illegal operation for community name supplied
  0 Encoding errors
  24 Number of requested variables
  0 Number of altered variables
  0 Get-request PDUs
  28 Get-next PDUs
  0 Set-request PDUs
  78 SNMP packets output
  0 Too big errors (Maximum packet size 1500)
  0 No such name errors
```

```
0 Bad values errors
0 General errors
24 Response PDUs
13 Trap PDUs
SNMP logging: enabled
Logging to 172.25.58.33.162, 0/10, 13 sent, 0 dropped.
```

Table 31: show snmp Field Descriptions, on page 375 describes the significant fields shown in the display.

Table 31: show snmp Field Descriptions

Field	Description
Chassis	Chassis ID string.
SNMP packets input	Total number of SNMP packets input.
Bad SNMP version errors	Number of packets with an invalid SNMP version.
Unknown community name	Number of SNMP packets with an unknown community name.
Illegal operation for community name supplied	Number of packets requesting an operation not allowed for that community.
Encoding errors	Number of SNMP packets that were improperly encoded.
Number of requested variables	Number of variables requested by SNMP managers.
Number of altered variables	Number of variables altered by SNMP managers.
Get-request PDUs	Number of get requests received
Get-next PDUs	Number of get-next requests received.
Set-request PDUs	Number of set requests received.
SNMP packets output	Total number of SNMP packets sent by the device.
Too big errors	Number of SNMP packets that were larger than the maximum packet size.
Maximum packet size	Maximum size of SNMP packets.
No such name errors	Number of SNMP requests that specified a MIB object that does not exist.
Bad values errors	Number of SNMP set requests that specified an invalid value for a MIB object.
General errors	Number of SNMP set requests that failed due to some other error. (It is not a noSuchName error, badValue error, or any of the other specific errors.)
Response PDUs	Number of responses sent in reply to requests.

Field	Description
Trap PDUs	Number of SNMP traps sent.
SNMP logging	Enabled or disabled logging.
sent	Number of traps sent.
dropped	Number of traps dropped. Traps are dropped when the trap queue for a destination exceeds the maximum length of the queue, as set by the **snmp-server queue-length** command.

Related Topics

show snmp mib, on page 387
snmp-server chassis-id, on page 396
snmp-server queue-length, on page 430

show snmp context

To display the enhanced SNMP context mappings, use the **show snmp context** command in EXEC mode.

show snmp context

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp context** command to display the protocol instance, topology and VRF mappings associated with an SNMP context.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp context** command:

```
RP/0/RP0/CPU0:router# show snmp context

Tue Dec 21 03:41:08.065 PST
Context-name       Vrf-name      Topology-Name   Instance-Name             Feature
con5                  vf5           tp5             in5                     OSPF
con6                  vf6           tp6             in6                     OSPF
con7                  vf7           tp7             in7                     OSPF
con8                  vf8           tp8             in8                     OSPF
```

Related Topics

snmp-server context mapping, on page 403

show snmp context-mapping

To display the SNMP context mapping table, use the **show snmp context-mapping** command in

XR EXEC

mode.

show snmp context-mapping

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.8.0	This command was introduced.
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The SNMP agent handles queries based on SNMP contexts created by client features. Use the **show snmp context-mapping** command to display the SNMP context mapping table. Each entry in the table includes the name of an SNMP context created by a client instance and the name of the client that created the context.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp context-mapping** command:

```
RP/0/RP0/CPU0:router# show snmp context-mapping

Wed Aug 6 01:42:35.227 UTC
Context-name                  Feature-name                  Feature
ControlEthernet0_RP0_CPU0_S0  ControlEthernet0_RP0_CPU0_S0  BRIDGEINST
ControlEthernet0_RP1_CPU0_S0     ControlEthernet0_RP1_CPU0_S0     BRIDGEINST
```

Table 32: show snmp context-mapping Field Descriptions

Field	Definition
Context-name	Name of an SNMP context.
Feature-name	Name of the instance that created the context.
Feature	Name of the client whose instance created the context.

show snmp engineid

To display the identification of the local Simple Network Management Protocol (SNMP) engine that has been configured on the router, use the **show snmp engineid** command in XR EXEC mode.

show snmp engineid

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An *SNMP engine* is a copy of SNMP that can reside on a local device.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp engineid** command:

```
RP/0/RP0/CPU0:router# show snmp engineid

  Local SNMP engineID: 0000000902000000C025808
```

Related Topics

snmp-server engineid local, on page 407

show snmp entity

To display the entPhysicalName and entPhysicalIndex mappings, use the **show snmp entity** command in

XR EXEC

mode.

show snmp entity

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp entity** command to view the entity index to use in the **snmp test trap entity** command. To use the **show snmp entity** command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp entity** command:

```
RP/0/RP0/CPU0:router# show snmp entity

Mon Nov 15 11:19:23.609 UTC
entPhysicalIndex:     172193 entPhysicalName: portslot 0/0/CPU0/1
entPhysicalIndex:     322450 entPhysicalName: voltages 0/0/CPU0
entPhysicalIndex:     345071 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     346659 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     349835 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     546880 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     845998 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     847586 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    1192623 entPhysicalName: 0/25/CPU0
entPhysicalIndex:    1227530 entPhysicalName: voltages 0/21/CPU0
entPhysicalIndex:    1460256 entPhysicalName: temperatures 0/18/CPU0
entPhysicalIndex:    1795138 entPhysicalName: temperatures 0/20/CPU0
entPhysicalIndex:    3079213 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    3080801 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    3082421 entPhysicalName: slot 7/0
entPhysicalIndex:    5037675 entPhysicalName: 0/21/CPU0
```

```
entPhysicalIndex:    5509481 entPhysicalName: voltages 0/9/CPU0
entPhysicalIndex:    6182130 entPhysicalName: voltages 0/9/CPU0
entPhysicalIndex:    6369487 entPhysicalName: portslot 0/9/CPU0/2
entPhysicalIndex:    8392407 entPhysicalName: temperatures 0/17/CPU0
entPhysicalIndex:    8548798 entPhysicalName: 0/21/CPU0 - host
entPhysicalIndex:   10735504 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   10737188 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   10738808 entPhysicalName: slot 1/1
entPhysicalIndex:   11312388 entPhysicalName: slot 7
entPhysicalIndex:   11314008 entPhysicalName: slot 3
entPhysicalIndex:   12644344 entPhysicalName: voltages 0/19/CPU0
entPhysicalIndex:   12761695 entPhysicalName: slot 24
entPhysicalIndex:   12763283 entPhysicalName: slot 20
entPhysicalIndex:   12907576 entPhysicalName: voltages 0/0/CPU0
entPhysicalIndex:   13262622 entPhysicalName: slot 16
entPhysicalIndex:   13290941 entPhysicalName: temperatures 0/16/CPU0
entPhysicalIndex:   13404457 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13406077 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13701859 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13900492 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13903700 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13905384 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   14106204 entPhysicalName: portslot 0/8/CPU0/2
entPhysicalIndex:   14256525 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   14979942 entPhysicalName: slot 2/2
entPhysicalIndex:   14981562 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   15141782 entPhysicalName: 0/19/CPU0
entPhysicalIndex:   15873651 entPhysicalName: temperatures 0/22/CPU0
entPhysicalIndex:   15986678 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   15988234 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   15991442 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16136999 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16138619 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16285636 entPhysicalName: temperatures 0/1/CPU0
entPhysicalIndex:   16287256 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16606045 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   16607633 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   16733769 entPhysicalName: 0/2/CPU0 - host
entPhysicalIndex:   16949774 entPhysicalName: portslot 0/0/CPU0/0
entPhysicalIndex:   17098539 entPhysicalName: temperatures 0/0/CPU0
entPhysicalIndex:   17122684 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17124272 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17127448 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17205790 entPhysicalName: 0/2/CPU0
entPhysicalIndex:   17322905 entPhysicalName: temperatures 0/7/CPU0
entPhysicalIndex:   17324589 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17595466 entPhysicalName: 0/25/CPU0 - host
entPhysicalIndex:   17620307 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17621991 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17623611 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   18003523 entPhysicalName: temperatures 0/21/CPU0
entPhysicalIndex:   18237837 entPhysicalName: voltages 0/18/CPU0
entPhysicalIndex:   18571163 entPhysicalName: voltages 0/20/CPU0
---More---
```

show snmp group

To display the names of groups on the router, security model, status of the different views, and storage type of each group, use the **show snmp group** command in

XR EXEC

mode.

show snmp group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp group** command:

```
RP/0/RP0/CPU0:router# show snmp group

  groupname: public security model:snmpv1
  readview : v1default writeview: -
  notifyview: v1default
  row status: nonVolatile

  groupname: public security model:snmpv2c
  readview : v1default writeview: -
  notifyview: v1default
  row status: nonVolatile
```

Table 33: show snmp group Field Descriptions

Field	Definition
groupname	Name of the Simple Network Management Protocol (SNMP) group or collection of users that have a common access policy.
readview	String identifying the read view of the group.
security model	Security model used by the group, either v1, v2c, or v3.
writeview	String identifying the write view of the group.
notifyview	String identifying the notify view of the group.
row status	Settings that are set in volatile or temporary memory on the device, or in nonvolatile or persistent memory where settings remain after the device is turned off and on again.

Related Topics

snmp-server group, on page 410

show snmp host

To display the configured Simple Network Management Protocol (SNMP) notification recipient host, User Datagram Protocol (UDP) port number, user, and security model, use the **show snmp host** command in

XR EXEC

mode.

show snmp host

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp host** command:

```
RP/0/RP0/CPU0:router# show snmp host

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3auth security model: v3 auth

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3noauth security model: v3 noauth

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3priv security model: v3 priv

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userv2c security model: v2c
```

Table 34: show snmp host Field Descriptions

Field	Definition
Notification host	Name or IP address of target host.
udp-port	UDP port number to which notifications are sent.
type	Type of notification configured.
user	Security level of the user.
security model	Version of SNMP used to send the trap, either v1, v2c, or v3.

show snmp mib

To display a list of MIB module object identifiers (OIDs) registered on the system, use the **show snmp mib** command in

EXEC

XR EXEC

mode.

show snmp mib [{*object-name* | **dll**}]

Syntax Description

object-name	(Optional) Specific MIB object identifier or object name.
dll	(Optional) Displays a list of all MIB DLL filenames and the OID supported by each DLL filename on the system.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp mib** command to display a list of the MIB module instance identifiers registered on the system.

Although the **show snmp mib** command can be used to display a list of MIB OIDs registered on the system, the use of a Network Management System (NMS) application is the recommended alternative for gathering this information.

The **show snmp mib** command is intended only for network managers who are familiar with Abstract Syntax Notation One (ASN.1) syntax and the Structure of Management Information (SMI) of Open Systems Interconnection (OSI) Reference Model.

SNMP management information is viewed as a collection of managed objects residing in a virtual information store termed the *MIB*. Collections of related objects are defined in MIB modules. These modules are written using a subset of ASN.1 termed the *SMI.*

The definitions for the OIDs displayed by this command can be found in the relevant RFCs and MIB modules. For example, RFC 1907 defines the system.x, sysOREntry.x, snmp.x, and snmpTrap.x OIDs, and this information is supplemented by the extensions defined in the CISCO-SYSTEM-MIB.

Use the **detailed** keyword to display a list of the MIB module instance identifiers registered on the system. The output displays additional details, such as DLL and configuration information.

Use the **dll** keyword to display a list of the MIB modules loaded into the agent. This command can be used to find the supported MIBs.

Note This command produces a high volume of output if SNMP is enabled on the system. To exit from a --More-- prompt, press **Crtl-Z**.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp mib** command:

```
RP/0/RP0/CPU0:router# show snmp mib

1.3.6.1.2.1.47.1.1.1.1.2
1.3.6.1.2.1.47.1.1.1.1.3
1.3.6.1.2.1.47.1.1.1.1.4
1.3.6.1.2.1.47.1.1.1.1.5
1.3.6.1.2.1.47.1.1.1.1.6
1.3.6.1.2.1.47.1.1.1.1.7
1.3.6.1.2.1.47.1.1.1.1.8
1.3.6.1.2.1.47.1.1.1.1.9
1.3.6.1.2.1.47.1.1.1.1.10
1.3.6.1.2.1.47.1.1.1.1.11
1.3.6.1.2.1.47.1.1.1.1.12
1.3.6.1.2.1.47.1.1.1.1.13
1.3.6.1.2.1.47.1.1.1.1.14
1.3.6.1.2.1.47.1.1.1.1.15
1.3.6.1.2.1.47.1.1.1.1.16
1.3.6.1.2.1.47.1.2.1.1.2
1.3.6.1.2.1.47.1.2.1.1.3
1.3.6.1.2.1.47.1.2.1.1.4
1.3.6.1.2.1.47.1.2.1.1.5
1.3.6.1.2.1.47.1.2.1.1.6
1.3.6.1.2.1.47.1.2.1.1.7
1.3.6.1.2.1.47.1.2.1.1.8
1.3.6.1.2.1.47.1.3.1.1.1
--More-
```

This example shows sample output from the **show snmp mib** command with the **detailed** keyword:

```
RP/0/RP0/CPU0:router# show snmp mib detailed

Entitymib:dll=/pkg/lib/mib/libEntitymib.dll, config=Entity.mib, loaded
1.3.6.1.2.1.47.1.1.1.1.2
1.3.6.1.2.1.47.1.1.1.1.3
1.3.6.1.2.1.47.1.1.1.1.4
1.3.6.1.2.1.47.1.1.1.1.5
1.3.6.1.2.1.47.1.1.1.1.6
1.3.6.1.2.1.47.1.1.1.1.7
1.3.6.1.2.1.47.1.1.1.1.8
1.3.6.1.2.1.47.1.1.1.1.9
1.3.6.1.2.1.47.1.1.1.1.10
1.3.6.1.2.1.47.1.1.1.1.11
```

```
1.3.6.1.2.1.47.1.1.1.1.12
1.3.6.1.2.1.47.1.1.1.1.13
1.3.6.1.2.1.47.1.1.1.1.14
1.3.6.1.2.1.47.1.1.1.1.15
1.3.6.1.2.1.47.1.1.1.1.16
1.3.6.1.2.1.47.1.2.1.1.2
1.3.6.1.2.1.47.1.2.1.1.3
1.3.6.1.2.1.47.1.2.1.1.4
1.3.6.1.2.1.47.1.2.1.1.5
1.3.6.1.2.1.47.1.2.1.1.6
1.3.6.1.2.1.47.1.2.1.1.7
1.3.6.1.2.1.47.1.2.1.1.8
--More--
```

This example shows sample output from the **show snmp mib** command with the **dll** keyword:

```
RP/0/RP0/CPU0:router# show snmp mib dll

Entitymib:dll=/pkg/lib/mib/libEntitymib.dll, config=Entity.mib, loaded
bgp4mib:dll=/pkg/lib/mib/libbgp4mib.dll, config=bgp4.mib, loaded
cdpmib:dll=/pkg/lib/mib/libcdpmib.dll, config=cdp.mib, loaded
ciscoprocessmib:dll=/pkg/lib/mib/libciscoprocessmib.dll,
 config=ciscoprocess.mib, loaded
ciscosyslogmib:dll=/pkg/lib/mib/libciscosyslogmib.dll,
 config=ciscosyslog.mib, loaded
ciscosystemmib:dll=/pkg/lib/mib/libciscosystemmib.dll,
 config=ciscosystem.mib, loaded
confcopymib:dll=/pkg/lib/mib/libconfcopymib.dll, config=confcopy.mib,
 loaded
configmanmib:dll=/pkg/lib/mib/libconfigmanmib.dll, config=configman.mib,
 loaded
dot3admib:dll=/pkg/lib/mib/libdot3admib.dll, config=dot3ad.mib,
 loaded
fabhfrmib:dll=/pkg/lib/mib/libfabhfrmib.dll, config=fabhfr.mib,
 loaded
fabmcastapplmib:dll=/pkg/lib/mib/libfabmcastapplmib.dll,
 config=fabmcastappl.mib, loaded
fabmcastmib:dll=/pkg/lib/mib/libfabmcastmib.dll, config=fabmcast.mib,
 loaded
flashmib:dll=/pkg/lib/mib/libflashmib.dll, config=flash.mib,
 loaded
hsrpmib:dll=/pkg/lib/mib/libhsrpmib.dll, config=hsrp.mib, loaded
icmpmib:dll=/pkg/lib/mib/libicmpmib.dll, config=icmp.mib, loaded
ifmib:dll=/pkg/lib/mib/libifmib.dll, config=if.mib, loaded
ipmib:dll=/pkg/lib/mib/libipmib.dll, config=ip.mib, loaded
mempoolmib:dll=/pkg/lib/mib/libmempoolmib.dll, config=mempool.mib,
 loaded
mplsldpmib:dll=/pkg/lib/mib/libmplsldpmib.dll, config=mplsldp.mib,
 loaded
.
.
.
```

Related Topics

show snmp, on page 374

show snmp mib bulkstat transfer

To display completed local bulk statistics files, use the **show snmp mib bulkstat transfer** command in EXEC mode.

show snmp mib bulkstat transfer [*transfer-name*]

Syntax Description

transfer-name	Specifies a named transfer file to display.

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp mib bulkstat transfer** command lists all bulk statistics virtual files (VFiles) on the system that have finished collecting data. (Data files that are not complete are not displayed.)

The output lists all of the completed local bulk statistics files, the remaining time left before the bulk statistics file is deleted (remaining retention period), and the state of the bulk statistics file. The state of the bulk statistics file should be Retry. Retry indicates that one or more transfer attempts have failed and that the file transfer will be attempted again. The number of retry attempts remaining is displayed in parenthesis. After the successful retry or retry attempts, the local files created by the MIB process in the router are deleted and data collection begins again.

To display only the status of a named transfer (as opposed to all configured transfers), specify the name of the transfer in the *transfer-name* argument. The *transfer-name* argument names a file which is supposed to be created even before the retries.

Task ID

Task ID	Operation
snmp	read

```
RP/0/RP0/CPU0:router# show snmp mib bulkstat transfer

Transfer Name : ifmib
 Retained files

 File Name        : Time Left (in seconds)   :STATE
 ----------------------------------------------------------
```

```
ifmib_Router_020421_100554683 : 173 : Retry (2 Retry attempt(s) Left)
```

show snmp request duplicates

To display the number of duplicate protocol data unit (PDU) requests dropped by the SNMP agent, use the **show snmp request duplicates** command in

XR EXEC

mode.

show snmp request duplicates

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp request duplicates** command:

```
RP/0/RP0/CPU0:router# show snmp request duplicates

No of Duplicate request received/Dropped : 0
```

show snmp users

To display information about the configured characteristics of Simple Network Management Protocol (SNMP) users, use the **show snmp users** command in

XR EXEC

mode.

show snmp users

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An SNMP user must be part of an SNMP group, as configured using the **snmp-server user** command.

Use the **show snmp users** command to display information about all configured users.

When configuring SNMP, you may see the logging message "Configuring snmpv3 USM user." USM stands for the User-Based Security Model (USM) for SNMP Version 3 (SNMPv3). For further information about USM, see RFC 3414, *User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)*.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp users** command:

```
RP/0/RP0/CPU0:router# show snmp users

  User name:user1
  Engine ID:localSnmpID
  storage-type:nonvolatile active
```

Table 35: show snmp users Field Descriptions

Field	Definition
User name	String identifying the name of the SNMP user.
Engine ID	String identifying the name of the copy of SNMP on the device.
storage-type	Settings that are set in volatile or temporary memory on the device, or in nonvolatile or persistent memory where settings remain after the device is turned off and on again.

Related Topics

snmp-server group, on page 410
snmp-server user, on page 453

show snmp view

To display the configured views and the associated MIB view family name, storage type, and status, use the **show snmp view** command in

XR EXEC

mode.

show snmp view

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp view** command:

```
RP/0/RP0/CPU0:router# show snmp view

  view1 1.3 - included nonVolatile active
  v1default 1.3.6.1 - included nonVolatile active
```

Related Topics

snmp-server group, on page 410
snmp-server user, on page 453

snmp-server chassis-id

To provide a message line identifying the Simple Network Management Protocol (SNMP) server serial number, use the **snmp-server chassis-id** command in

XR Config

mode. To restore the default value, if any, use the **no** form of this command.

snmp-server chassis-id *serial-number*
no snmp-server chassis-id

Syntax Description

serial-number	Unique identification string to identify the chassis serial number.

Command Default

On hardware platforms, where the serial number can be read by the device, the default is the serial number. For example, some Cisco devices have default chassis ID values of their serial numbers.

Command Modes

XR Config

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server chassis-id** command to provide a message line identifying the SNMP server serial number.

The chassis ID message can be displayed with the **show snmp** command.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to specify the chassis serial number 1234456:

```
RP/0/RP0/CPU0:router# snmp-server chassis-id 1234456
```

Related Topics

show snmp, on page 374

snmp-server community

To configure the community access string to permit access to the Simple Network Management Protocol (SNMP), use the **snmp-server community** command in

XR Config

mode. To remove the specified community string, use the **no** form of this command.

snmp-server community [{**clear** | **encrypted**}] *community-string* [**view** *view-name*] [{**RO** | **RW**}] [{**SDROwner** | **SystemOwner**}] [*access-list-name*]
no snmp-server community *community-string*

Syntax Description

clear	(Optional) Specifies that the entered *community-string* is clear text and should be encrypted when displayed by the **show running** command.
encrypted	(Optional) Specifies that the entered *community-string* is encrypted text and should be displayed as such by the **show running** command.
community-string	Community string that acts like a password and permits access to the SNMP protocol. The maximum length of the *community-string* argument is 32 alphabetic characters. If the **clear** keyword was used, *community-string* is assumed to be clear text. If the **encrypted** keyword was used, *community-string* is assumed to be encrypted. If neither was used, *community-string* is assumed to be clear text.
view *view-name*	(Optional) Specifies the name of a previously defined view. The view defines the objects available to the community.
RO	(Optional) Specifies read-only access. Authorized management stations are able only to retrieve MIB objects.
RW	(Optional) Specifies read-write access. Authorized management stations are able both to retrieve and to modify MIB objects.
SDROwner	(Optional) Limits access to the owner service domain router (SDR).
SystemOwner	(Optional) Provides system-wide access.
access-list-name	(Optional) Name of an access list of IP addresses allowed to use the community string to gain access to the SNMP agent.

Command Default

By default, an SNMP community string permits read-only access to all MIB objects.

By default, a community string is assigned to the SDR owner.

Command Modes

XR Config

Command History

Release	Modification
Release 3.9.0	No modification.

Release	Modification
Release 4.2.0	IPv6 was supported.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server community** command to configure the community access string to permit access to SNMP.

To remove the specified community string, use the **no** form of this command.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

When the **snmp-server community** command is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the **snmp-server community** command is entered with the **SystemOwner** keyword, SNMP access is granted to .

Task ID

Task ID	Operations
snmp	read, write

This example shows how to assign the string comaccess to SNMP, allowing read-only access, and to specify that IP access list 4 can use the community string:

```
RP/0/RP0/CPU0:router(config)# snmp-server community comaccess ro 4
```

The following example shows how to assign the string mgr to SNMP, allowing read-write access to the objects in the restricted view:

```
RP/0/RP0/CPU0:router(config)# snmp-server community mgr view restricted rw
```

This example shows how to remove the community comaccess:

```
RP/0/RP0/CPU0:router(config)#no snmp-server community comaccess
```

Related Topics

snmp-server view, on page 456

snmp-server community-map

To associate a Simple Network Management Protocol (SNMP) community with an SNMP context, security name, or a target-list use the **snmp-server community-map** command in

XR Config

mode. To change an SNMP community mapping to its default mapping, use the **no** form of this command.

snmp-server community-map [{**clear** | **encrypted**}] *community-string* [**context** *context-name*] [**security-name** *security-name*] [**target-list** *target*]
no snmp-server community-map [{**clear** | **encrypted**}] *community-string*

Syntax Description

clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the community-string argument is encrypted text.
community-string	Name of the community.
context *context-name*	(Optional) Name of the SNMP context to which this community name is to be mapped.
security-name *security-name*	(Optional) Security name for this community. By default, the *string* is the security name.
target-list *target*	(Optional) Name of the target list for this community.

Command Default

The value of the *community-string* argument is also the security name.

Command Modes

XR Config

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server community-map** command to map an SNMPv1 or SNMPv2c community name to one or more of the following:

- **context name**—Maps a community name to a specific SNMP context name. This allows MIB instances in an SNMP context to be accessed through SNMPv1 or SNMPv2c using this community name.
- **security name**—By default, the community name is used to authenticate SNMPv1 and SNMPv2c. Configure a security name for a community name to override the default and authenticate SNMP with the security name.

- **target**—Target list identifies a list of valid hosts from which SNMP access can be made using a specific security name. When such mapping is done for a particular community name, SNMP access is allowed only from hosts included in the target list.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

Task ID

Task ID	Operations
snmp	read, write

This example maps the community name “sample 2” to the SNMP context name “sample1”:

```
RP/0/RP0/CPU0:router(config)# snmp-server community-map sample2 context sample1
```

Related Topics

snmp-server context, on page 402
snmp-server target list, on page 431

snmp-server contact

To set the Simple Network Management Protocol (SNMP) system contact, use the **snmp-server contact** command in

XR Config

mode. To remove the system contact information, use the **no** form of this command.

snmp-server contact *system-contact-string*
no snmp-server contact

Syntax Description

system-contact-string	String that describes the system contact information. The maximum string length is 255 alphanumeric characters.

Command Default

No system contact is set.

Command Modes

XR Config

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server contact** command to set the system contact string. Use the **no** form of this command to remove the system contact information.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to specify a system contact string:

```
RP/0/RP0/CPU0:router(config)# snmp-server contact Dial System Operator at beeper # 27345
```

Related Topics

snmp-server location, on page 417

snmp-server context

To create a Simple Network Management Protocol (SNMP) context, use the **snmp-server context** command in

XR Config

mode. To remove an SNMP context, use the **no** form of this command.

snmp-server context *context-name*
no snmp-server context *context-name*

Syntax Description

context-name	Name of the SNMP context.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

This command creates an SNMP context. By default, all the SNMP MIB instances are in a default context. Create an SNMP context and map it to a particular feature to enable similar instances of the same object to co-exist in different SNMP contexts.

Task ID

Task ID	Operations
snmp	read, write

This example creates a new SNMP context named “sample1:”

```
RP/0/RP0/CPU0:router(config)# snmp-server context sample1
```

Related Topics

snmp-server community-map, on page 399
snmp-server vrf, on page 458

snmp-server context mapping

To map an SNMP context with a protocol instance, topology or VRF entity, use the **snmp-server context mapping** command in global configuration mode.

snmp-server context mapping *context-name* [**feature** *feature-name*] [**instance** *instance-name*] [**topology** *topology-name*] [**vrf** *vrf-name*]

Syntax Description

context-name	Name of the SNMP context.
feature *feature-name*	Specifies the protocol for which to map the context. Available options are: • **bridge**—Layer 2 VPN bridge • **vrf**—Virtual Routing and Forwarding
instance *instance-name*	Maps the context to the specified protocol instance.
topology *topology-name*	Maps the context to the specified protocol topology.
vrf *vrf-name*	Maps the context to the specified VRF logical entity.

Command Default

No context mappings exist by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A device can support multiple instances of a logical network entity, such as protocol instances or VRFs. Most existing MIBs cannot distinguish between these multiple logical network entities. For example, the original OSPF-MIB assumes a single protocol instance on a device, but you can now configure multiple OSPF instances on a device.

The **snmp-server context mapping** command maps a context to a protocol instance, topology or VRF logical entity.

Note The snmp-server context mapping command does not work for OSPF and OSPFv3. Refer to the **snmp context** commands.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to map an snmp context to an OSPF instance:

```
RP/0/RP0/CPU0:router(config)# snmp-server context mapping con5 feature ospf instance in1
```

Related Topics

snmp context (OSPF)
snmp context (OSPFv3)
show snmp context, on page 377

snmp-server drop report acl

To apply an ACL policy for restricting an SNMPv3 unknown engine-id report to be sent out to NMS, use the **snmp-server drop report acl** command in the configuration mode.

snmp-server drop report acl IPv4 *IPv4-acl-name* **IPv6** *IPv6-acl-name*

Syntax Description

acl	Specifies IP Access Control Lists (ACL) policy
IPv4 *IPv4-acl-name*	Defines an IPv4 ACL name.
IPv6 *IPv6-acl-name*	Defines an IPv6 ACL name.

Command Default

Unknown engine-id reports will be sent to all polling stations (even if other ACLs are configured).

Command Modes

Configuration mode

Command History

Release	Modification
Release 6.2.3	This command was introduced.

Usage Guidelines

To drop an unknown engine-id report, you can either configure IPv4/IPv6 ACL name or both. When router is polled with wrong engine-id or no engine-id during a snmpv3 packet exchange, the unknown engine-id report will be sent based on the ACL policy that is configured.

Unknown engine-id reports will be sent only to polling station addresses that are permitted by ACL.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to configure the SNMP server to drop the unknown engin-id report:

```
RP/0/RP0/CPU0:router (config) #  snmp-server drop report acl IPv4 nms-block IPv6
nms-block-ipv6
```

snmp-server drop unknown-user

To avoid error PDUs being sent out of router when polled with incorrect SNMPv3 user name, use the **snmp-server drop unknown-user** command in the appropriate mode. If the configuration is not set, by default it will respond with error PDUs.

snmp-server drop unknown-user

Syntax Description

drop unknown-user	Drop the error PDUs to be sent when router is polled with incorrect SNMPv3 user name.

Command Default

Unknown error PDUs will be sent when router is polled with incorrect SNMPv3 user name.

Command Modes

XR config

Command History

Release	Modification
Release 6.2.3	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to configure the SNMP server to drop the error PDUs:

```
RP/0/RP0/CPU0:router (config) #  snmp-sever drop unknown-user
```

snmp-server engineid local

To specify Simple Network Management Protocol (SNMP) engine ID on the local device, use the **snmp-server engineid local** command in

XR Config

mode. To return the engine ID to the default, use the **no** form of this command.

snmp-server engineid local *engine-id*
no snmp-server engineid local *engine-id*

Syntax Description

engine-id	Character string that identifies the engine ID. Consists of up to 24 characters in hexadecimal format. Each hexadecimal number is separated by a colon (:).

Command Default

An SNMP engine ID is generated automatically.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure the SNMP engine ID on the local device:

```
RP/0/RP0/CPU0:router(config)# snmp-server engineID local 00:00:00:09:00:00:00:a1:61:6c:20:61
```

Related Topics

show snmp engineid, on page 380

snmp-server engineid remote

To specify a Simple Network Management Protocol (SNMP) engine ID on a remote device, use the **snmp-server engineid remote** command in

XR Config

mode. To return the engine ID to the default, use the **no** form of this command.

snmp-server engineid remote *ip-address engine-id* **udp-port** *port*
no snmp-server engineid remote *ip-address engine-id* **udp-port** *port*

Syntax Description

ip-address	IP address of remote SNMP notification host
engine-id	Character string that identifies the engine ID. Consists of up to 24 characters in hexadecimal format. Each hexadecimal number is separated by a colon (:).
udp-port *port*	(Optional) Specifies the User Datagram Protocol (UDP) port of the host to use. Range is from 1 to 65535. The default UDP port is 161.

Command Default

An SNMP engine ID is generated automatically.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The IP address of the remote host can be in either IPv4 or IPv6 format.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to configure the SNMP engine ID on the local device:

```
RP/0/RP0/CPU0:Router(config)# snmp-server engineID remote 172.16.4.1
00:00:00:09:00:00:00:a1:61:6c:20:61
```

Related Topics

show snmp engineid, on page 380
snmp-server engineid local, on page 407

snmp-server entityindex persist

To enable the persistent storage of ENTITY-MIB data across process restarts, switchovers, and device reloads, use the **snmp-server entityindex persist** command in

XR Config

mode. To disable the persistent storage of ENTITY-MIB data, use the **no** form of this command.

snmp-server entityindex persist
no snmp-server entityindex persist

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example illustrates how to enable persistent storage of ENTITY-MIB indices:

```
RP/0/RP0/CPU0:router(config)# snmp-server entityindex persist
```

Related Topics

snmp-server mibs cbqosmib persist

snmp-server group

To configure a new Simple Network Management Protocol (SNMP) group, or a table that maps SNMP users to SNMP views, use the **snmp-server group** command in

XR Config

mode. To remove a specified SNMP group, use the **no** form of this command.

snmp-server group *name* {**v1** | **v2c** | **v3** {**auth** | **noauth** | **priv**}} [**read** *view*] [**write** *view*] [**notify** *view*] [**context** *context-name*] [*access-list-name*]
no snmp-server group *name*

Syntax Description

name	Name of the group.
v1	Specifies a group that uses the SNMPv1 security model. The SNMP v1 security model is the least secure of the possible security models.
v2c	Specifies a group that uses the SNMPv2c security model. The SNMPv2c security model is the second least secure of the possible security models.
v3	Specifies a group that uses the SNMPv3 security model. The SNMP v3 security is the most secure of the possible security models.
auth	Specifies authentication of a packet without encrypting it.
noauth	Specifies no authentication of a packet.
priv	Specifies authentication of a packet with encryption.
read *view*	(Optional) Specifies a read view string (not to exceed 64 characters) that is the name of the view that allows only the contents of the agent to be viewed.
write *view*	(Optional) Specifies a write view string (not to exceed 64 characters) that is the name of the view used to enter data and configure the contents of the agent.
notify *view*	(Optional) Specifies a notify view string (not to exceed 64 characters) that is the name of the view used to specify a notify or trap.
context *context-name*	(Optional) Specifies the SNMP context to associate with this SNMP group and associated views.
access-list-name	(Optional) Access list string (not to exceed 64 characters) that is the name of the access list.

Command Default

See Table 36: snmp-server group Default Descriptions, on page 411.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Release	Modification
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This table describes the default values for the different views:

Table 36: snmp-server group Default Descriptions

Default	Definition
read *view*	Assumed to be every object belonging to the Internet (1.3.6.1) object identifier (OID) space, unless the user uses the **read** option to override this state.
write *view*	Nothing is defined for the write view (that is, the null OID). You must configure write access.
notify *view*	Nothing is defined for the notify view (that is, the null OID). If a view is specified, any notifications in that view that are generated are sent to all users associated with the group (provided an SNMP server host configuration exists for the user).

Configuring Notify Views

Do not specify a notify view when configuring an SNMP group for the following reasons:

- The **snmp-server host** command autogenerates a notify view for the user, and then adds it to the group associated with that user.
- Modifying the notify view of the group affects all users associated with that group.

The notify view option is available for two reasons:

- If a group has a notify view that is set using SNMP, you may need to change the notify view.
- The **snmp-server host** command may have been configured before the **snmp-server group** command. In this case, reconfigure the **snmp-server host** command or specify the appropriate notify view.

Instead of specifying the notify view for a group as part of the **snmp-server group** command, use the following commands in global configuration mode:

- **snmp-server user**—Configures an SNMP user.
- **snmp-server group**—Configures an SNMP group, without adding a notify view.
- **snmp-server host**—Autogenerates the notify view by specifying the recipient of a trap operation.

Working with Passwords and Digests

No default values exist for authentication or privacy algorithms when this command is configured. In addition, no default passwords exist. The minimum length for a password is one character, although we recommend using eight characters for security. A plain-text password or localized Message Digest 5 (MD5) password can be specified. Forgotten passwords cannot be recovered, and the user must be reconfigured.

SNMP Contexts

SNMP contexts provide Virtual Private Network (VPN) users with a secure way of accessing MIB data. When a VPN is associated with a context, that VPN's specific MIB data exists in that context. Associating a VPN with a context enables service providers to manage networks with multiple VPNs. Creating and associating a context with a VPN enables a provider to prevent the users of one VPN from accessing information about users of other VPNs on the same networking device.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to configure an SNMP version 3 group named group1 that requires the authentication of packets with encryption:

```
RP/0/RP0/CPU0:router(config)# snmp-server group group1 v3 priv
```

Related Topics

show snmp, on page 374
show snmp group, on page 383
snmp-server host, on page 413
snmp-server view, on page 456

snmp-server host

To specify the recipient of a Simple Network Management Protocol (SNMP) notification operation, use the **snmp-server host** command in

XR Config

mode. To remove the specified host, use the **no** form of this command.

snmp-server host *address* [{**clear** | **encrypted**}] [**informs**] [**traps**] [**version** {**1** | **2c** | **3** {**auth** | **noauth** | **priv**}}] *community-string* [**udp-port** *port*] [*notification-type*]
nosnmp-server host *address* [{**clear** | **encrypted**}] [**informs**] [**traps**] [**version** {**1** | **2c** | **3** {**auth** | **noauth** | **priv**}}] *community-string* [**udp-port** *port*] [*notification-type*]

Syntax Description

address	Name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the *community-string* argument is encrypted text.
informs	(Optional) Specifies to send inform messages to this host.
traps	(Optional) Specifies that notifications should be sent as traps. This is the default.
version	(Optional) Specifies the version of the SNMP used to send the traps.
1	Specifies SNMPv1, the default.
2c	Specifies SNMPv2C.
3	Specifies SNMPv3. Version 3 is the most secure model because it allows packet encryption. If you specify the SNMPv3 keyword, you must specify the security level.
auth	Enables Message Digest 5 (MD5) algorithm and Secure Hash Algorithm (SHA) packet authentication.
noauth	Specifies that the noAuthNoPriv security level applies to this host. This is the default security level for SNMPv3.
priv	Enables Data Encryption Standard (DES) packet encryption (also called "privacy").
community-string	Password-like community string sent with the notification operation. We recommend defining this string using the **snmp-server community** command prior to using the **snmp-server host** command.
udp-port *port*	(Optional) Specifies the User Datagram Protocol (UDP) port of the host to use. Range is from 1 to 65535. The default UDP port is 161.

notification-type	(Optional) Type of notification to be sent to the host. If no type is specified, all available notifications are sent. The notification type can be one or more of these keywords: • **bgp** —Enables SNMP Border Gateway Protocol Version 4 (BGPv4) traps. • **config** —Controls configuration notifications, as defined in the CISCO-CONFIG-MAN-MIB (enterprise 1.3.6.1.4.1.9.9.43.2). The notification type is (1) ciscoConfigManEvent. • **copy-complete** —Enables CISCO-CONFIG-COPY-MIB ccCopyCompletion traps. • **entity** —Controls Entity MIB modification notifications. This notification type is defined in the ENTITY-MIB (enterprise 1.3.6.1.2.1.47.2) as: (1) entConfigChange. • **fabric** —Enables SNMP fabric traps. • **fru-ctrl** —Enables SNMP entity field-replaceable unit (FRU) control traps. • **mpls** —Enables SNMP Multiprotocol Label Switching (MPLS) traps. • **sensor** —Enables SNMP entity sensor traps. • **snmp** —Enables SNMP traps. • **syslog** —Controls error message notifications (Cisco-syslog-MIB). Specify the level of messages to be sent with the **logging history** command.

Command Default

This command is disabled by default. No notifications are sent.

The default UDP port is 161.

When this command is entered without keywords, the default is to send all trap types to the host.

If no version keyword is entered, the default is version 1.

If version 3 is specified, but the security level is not specified, the default security level is noauth.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 4.1.0	The **informs** keyword was added.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps. Traps are unreliable because the receiver does not send acknowledgments when it receives traps. The sender cannot determine if the traps were received. Traps are discarded as soon as they are sent. Traps are also sent only once.

When the **snmp-server host** command is not entered, no notifications are sent. To configure the device to send SNMP notifications, configure at least one **snmp-server host** command. When the command is entered without keywords, all trap types are enabled for the host.

To enable multiple hosts, issue a separate **snmp-server host** command for each host. You can specify multiple notification types in the command for each host.

When multiple **snmp-server host** commands are given for the same host and kind of notification (trap), each succeeding **snmp-server host** command overwrites the previous command. Only the last **snmp-server host** command is in effect. For example, if an **snmp-server host** command with the **traps** keyword is entered for a host and then another command with the **traps** keyword is entered for the same host, the second command replaces the first.

Either a host name or IP address can be used to specify the host. Both IPv4 and IPv6 IP address formats are supported.

The **snmp-server host** command is used with the **snmp-server engineid** command. Use the **snmp-server traps** command to specify which SNMP notifications are sent globally. For a host to receive most notifications, at least one **snmp-server traps** command and the **snmp-server host** command for that host must be enabled.

However, some notification types cannot be controlled with the **snmp-server traps** command. For example, some notification types are always enabled. Other notification types are enabled by a different command.

The availability of a notification-type depends on the device type and Cisco software features supported on the device.

To display which notification types are available on the system, use the question mark (**?**) online help function at the end of the **snmp-server host** command.

The **no snmp-server host** command used with no keywords disables traps.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

If the **informs** keyword is used, the SNMP version can be only SNMPv2C or SNMPv3.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to send RFC 1157 SNMP traps to the host specified by the name myhost.cisco.com. Other traps are enabled, but only SNMP traps are sent because only the **snmp** keyword is specified in the **snmp-server host** command. The community string is defined as comaccess.

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com comaccess snmp
```

This example shows how to send the SNMP traps to address 172.30.2.160:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp
RP/0/RP0/CPU0:router(config)# snmp-server host 172.30.2.160 public snmp
```

This example shows how to enable the router to send all traps to the host, myhost.cisco.com, using the community string public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public
```

This example shows how to prevent traps from being sent to any host. The BGP traps are enabled for all hosts, but only the configuration traps are enabled to be sent to a host.

```
RP/0/RP0/CPU0:router(config)# snmp-server traps bgp
RP/0/RP0/CPU0:router(config)# snmp-server host hostabc public config
```

This example shows how to send SNMPv3 informs to a host:

```
RP/0/RP0/CPU0:router(config)# snmp-server host 172.30.2.160 informs version 3
```

Related Topics

snmp-server engineid local, on page 407
snmp-server inform
snmp-server traps bgp

snmp-server location

To specify the system location for Simple Network Management Protocol (SNMP), use the **snmp-server location** command in

XR Config

mode. To remove the location string, use the **no** form of this command.

snmp-server location *system-location*
no snmp-server location

Syntax Description

system-location	String indicating the physical location of this device. The maximum string length is 255 alphanumeric characters.

Command Default

No system location string is set.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to specify a system location string:

```
RP/0/RP0/CPU0:router(config)# snmp-server location Building 3/Room 214
```

Related Topics

snmp-server contact, on page 401

snmp-server logging threshold

To configure the thresholds for SNMP data logging, use the **snmp-server logging threshold** command in the appropriate mode.

snmp-server logging threshold [**oid-processing** | **pdu-processing**] *threshold-time*

Syntax Description

oid-processing	Threshold to start logging slow OID requests processing
pdu-processing	Threshold to start logging slow PDU requests processing
threshold-time	Threshold time in milli seconds.

Command Default

500 ms

Command Modes

XR configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This command shows how to set the threshold value at 100 ms:

```
RP/0/RP0/CPU0:router (config) # snmp-server logging threshold pdu-processing 100
```

snmp-server correlator

To configure properties for the event correlator, use the **snmp-server correlator** in the appropriate mode.

snmp-server correlator [**apply** | **buffer-size** | **rule** | **ruleset**]

Syntax Description

apply	Applies a rule or ruleset.
buffer-size	Configures the size of the correlator buffer.
rule	Configures a specified correlation rule.
ruleset	Configures a specified correlation ruleset.

Command Default

None

Command Modes

XR config

Command History

Release	Modification
Release 4.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to set the correlator buffer size to 2000:

```
RP/0/RP0/CPU0:router (config) #  snmp-sever correlator buffer-size 2000
```

snmp-server mib bulkstat max-procmem-size

To configure the overall per-process memory size limit used by all bulk statistics files in the process, use the **snmp-server mib bulkstat max-procmem-size** command in

XR Config

mode. To remove the overall per-process memory size, use the **no** form of this command.

snmp mib bulkstat max-procmem-size *size*
no snmp mib bulkstat max-procmem-size [*size*]

Syntax Description

size	Overall per-process memory size limit in kilobytes. The valid range is from 100 to 200000. The default is 200000.

Command Default

The maximum process memory size is 200000 KB.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Currently 300 MB is the maximum process memory available for MIB and SNMP processes.

Task ID

Task ID	Operation
snmp	read, write

This example sets the maximum process memory size to 100000 KB.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat max-procmem-size 100000
```

snmp-server mib bulkstat object-list

To configure a Simple Network Management Protocol (SNMP) bulk statistics object list and enter bulk statistics objects configuration mode, use the **snmp-server mib bulkstat object-list** in

XR Config

mode. To remove an SNMP object list configuration, use the **no** form of this command.

snmp-server mib bulkstat object-list *object-list-name*
no snmp-server mib bulkstat object-list *object-list-name*

Syntax Description

object-list-name	Name or object identifier (OID) of the bulk statistics object list to configure.

Command Default

No SNMP bulk statistics object list is configured.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server mib bulkstat object-list** command allows you to name an object list. Bulk statistics object lists are used for the Periodic MIB Data Collection and Transfer Mechanism.Use the **add** command to add objects to the object list configured with the **snmp-server mib bulkstat object-list** command. Bulk statistics object lists can be reused in multiple schemas.

Task ID

Task ID	Operation
snmp	read, write

In this example, a bulk statistics object list called ifmib is configured to include two objects:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifOutOctets
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifInOctets
```

Related Topics

add (bulkstat object), on page 352
show snmp mib bulkstat transfer, on page 390

snmp-server mib bulkstat schema

To configure a Simple Network Management Protocol (SNMP) bulk statistics schema and enter bulk statistics schema configuration mode, use the **snmp-server mib bulkstat schema** command in

XR Config

mode. To remove the SNMP bulk statistics schema, use the **no** form of this command.

snmp-server mib bulkstat schema *schema-name*
no snmp-server mib bulkstat schema *schema-name*

Syntax Description

schema-name	Specifies the name of the schema to configure.

Command Default

No schemas are configured.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server mib bulkstat schema** command names the schema and enters bulk statistics schema configuration mode. Bulk statistics schema configuration mode is used to configure the object list, instance, and polling interval to be used in the schema.

The specific instances of MIB objects for which data should be collected are determined by appending the value of the **instance** command to the objects specified in the object list.

Multiple schemas can be associated with a single bulk statistics file when configuring the bulk statistics transfer options.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a bulk statistics schema called GigE0/6/5/0:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat schema tengige 0/6/5/0
RP/0/RP0/CPU0:router(config-bulk-sc)# object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 3
RP/0/RP0/CPU0:router(config-bulk-sc)# instance exact interface tengige 0/6/5/0 subif
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# exit
```

Related Topics

instance (bulkstat schema), on page 360
poll-interval, on page 368

snmp-server mib bulkstat transfer-id

To identify the bulk statistics transfer configuration and enter bulk statistics transfer configuration mode, use the **snmp-server mib bulkstat transfer-id** command in

XR Config

mode. To remove a previously configured transfer, use the **no** form of this command

snmp-server mib bulkstat transfer-id *transfer-id*
no snmp-server mib bulkstat transfer-id *transfer-id*

Syntax Description

transfer-id	Name of the transfer configuration.

Command Default

Bulk statistics transfer is not configured.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The name, *transfer-id*, you specify for the bulk statistics transfer configuration is used in the filename of the bulk statistics file when it is generated and is used to identify the transfer configuration in the output of the **show snmp mib bulkstat transfer** command.

Task ID

Task ID	Operation
snmp	read, write

In this example, The bulk statistics transfer is given the name bulkstat1 and contains two schemas:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# schema CAR
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary
ftp://user1:pswrd@cbin2-host/users/user1/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# url secondary
tftp://user1@10.1.0.1/tftpboot/user1/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# format schemaASCII
RP/0/RP0/CPU0:router(config-bulk-tr)# transfer-interval 30
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 5
RP/0/RP0/CPU0:router(config-bulk-tr)# buffer-size 1024
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 30
RP/0/RP0/CPU0:router(config-bulk-tr)# end
```

Related Topics

buffer-size, on page 353
format (bulkstat), on page 357
retain, on page 369
retry, on page 371
schema, on page 373
show snmp mib bulkstat transfer, on page 390
transfer-interval, on page 468
url, on page 470

snmp-server notification-log-mib

To configure the NOTIFICATION-LOG-MIB, use the **snmp-server notification-log-mib** command in

XR Config

mode. To remove the specified configuration, use the **no** form of this command.

snmp-server notification-log-mib {**globalAgeOut** *time* | **globalSize** *size* | **default** | **disable** | **size** *size*}
no snmp-server notification-log-mib {**globalAgeOut** | **globalSize** | **default** | **disable** | **size**}

Syntax Description

globalAgeOut *time*	Specifies how much time, in minutes, a notification remains in the log. Values for the *time* argument can range from 0 to 4294967295; the default is 15.
globalSize *size*	Specifies the maximum number of notifications that can be logged in all logs. The default is 500.
default	Specifies to create a default log.
disable	Specifies to disable logging to the default log.
size *size*	Specifies the maximum number of notifications that the default log can hold. The default is 500.

Command Default

NOTIFICATION-LOG-MIB notifications are not logged.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Logging of NOTIFICATION-LOG-MIB notifications begins when the default log is created. Named logs are not supported, therefore only the default log can be created.

Task ID

Task ID	Operations
snmp	read, write

The following example creates a default log for notifications:

```
RP/0/RP0/CPU0:router(config)# snmp-server notification-log-mib default
```

This example removes the default log:

```
RP/0/RP0/CPU0:router(config)# no snmp-server notification-log-mib default
```

This example configures the size of all logs to be 1500:

```
RP/0/RP0/CPU0:router(config)# snmp-server notification-log-mib globalSize 1500
```

Related Topics

snmp-server community-map, on page 399

snmp-server overload-control

To set the overload control parameters for handling incoming messages in critical processing mode, use the **snmp-server overload-control** command in the appropriate mode.

snmp-sever overload-control *drop-time throttle-rate*

Syntax Description

drop-time	Drop time for incoming queue. Range is 0 to 300 ms.
throttle-rate	Throttle-rate for incoming queue. Range os 0 to 500.

Command Default

Default is 1 sec

Command Modes

XR config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to set the control parameters:

```
RP/0/RP0/CPU0:router (config) # snmp-server overload-control 100 100
```

snmp-server packetsize

To establish control over the largest Simple Network Management Protocol (SNMP) packet size permitted when the SNMP server is receiving a request or generating a reply, use the **snmp-server packetsize** command in

XR Config

mode. To restore the default value, use the **no** form of this command.

snmp-server packetsize *size*
no snmp-server packetsize

Syntax Description

size	Packet size, in bytes. Range is from 484 to 65500. The default is 1500.

Command Default

size: 1500

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server packetsize** command to establish control over the largest SNMP packet size permitted when the SNMP server is receiving a request or generating a reply.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to set the maximum size of SNMP packets to 1024 bytes:

```
RP/0/RP0/CPU0:router(config)# snmp-server packetsize 1024
```

snmp-server queue-length

To establish the message queue length for each trap host for Simple Network Management Protocol (SNMP), use the **snmp-server queue-length** command in

XR Config

mode. To restore the default value, use the **no** form of this command.

snmp-server queue-length *length*
no snmp-server queue-length

Syntax Description

length	Integer that specifies the number of trap events that can be held before the queue must be emptied. Range is from 1 to 5000.

Command Default

length : 100

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server queue-length** command to define the length of the message queue for each trap host. After a trap message is successfully sent, Cisco IOS XR software continues to empty the queue at a throttled rate to prevent trap flooding.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to set the SNMP notification queue to 20 events:

```
RP/0/RP0/CPU0:router(config)# snmp-server queue-length 20
```

snmp-server target list

To create a Simple Network Management Protocol (SNMP) target list, use the **snmp-server target list** command in

XR Config

mode. To remove an SNMP target list, use the **no** form of this command.

snmp-server target list *target-list* {**vrf** *vrf-name* | **host** *hostname*}
no snmp-server target list *target-list*

Syntax Description

target-list	Name of the target list.
vrf *vrf-name*	Specifies the name of the VRF hosts included in the target list.
host *hostname*	Assigns a hostname to the target list. The *hostname* variable is a name or IP address.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to create an SNMP target list and assign hosts to the list. When a target list is mapped to a community name using the **snmp-server community-map** command, SNMP access is restricted to the hosts in the target list (for that community name).

The host IP address can be in either IPv4 or IPv6 format.

Task ID

Task ID	Operations
snmp	read, write

In this example, a new target list “sample3” is created and assigned to the vrf server “server2:”

```
RP/0/RP0/CPU0:router(config)# snmp-server target list sample3 vrf server2
```

Related Topics

snmp-server community-map, on page 399

snmp-server throttle-time

To specify the throttle time for handling incoming Simple Network Management Protocol (SNMP) messages, use the **snmp-server throttle-time** command in

XR Config

mode. To restore the throttle time to its default value, use the **no** form of this command.

snmp-server throttle-time *time*
no snmp-server throttle-time

Syntax Description

time	Throttle time for the incoming queue, in milliseconds. Values can be from 50 to 1000.

Command Default

time : 0

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the throttle time is set to 500 milliseconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server throttle-time 500
```

Related Topics

snmp-server community-map, on page 399

snmp-server timeouts subagent

To change the timeout used by the SNMP agent while it waits for a response from a subagent, use the **snmp-server timeouts subagent** command in

XR Config

mode. SNMP subagents are feature-specific entities that register with the SNMP agent and implement sets of MIB objects.

snmp-server timeouts subagent *timeout*
no snmp-server timeouts subagent *timeout*

Syntax Description

timeout	The timeout used by the SNMP agent when waiting for a response from a MIB module, in seconds. The default is 10.

Command Default

timeout : 10

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the timeout is set to 8 seconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server timeouts subagent 8
```

snmp-server timeouts duplicate

To set the timeout value for the snmp-sever duplicate request feature, use the **snmp-server timeouts duplicate** command in the appropriate mode. To delete the set value, use the **no** form of the command.

snmp-server timeouts duplicate *timeout-value*
no snmp-server timeouts duplicate *timeout-value*

Syntax Description

timeout-value Timeout value in seconds. Range is 0 to 20 seconds.

- 0- To Remove this feature support. i.e SNMP will process all the packets irrespective of duplicate (retry) Packets.
- 1- This is the default value, i.e if no configuration is present , then, the timeout value is set to 1. If any packet takes more than 1 second for getting processed, then the Duplicate drop feature is enabled.
- 2 to 20 - if the packet processing is done between 2 and 20 seconds, then the Duplicate drop feature is enabled.

Command Default

1 second

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.1	This feature was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to use the **snmp-server timeouts duplicate** command:

```
RP/0/RP0/CPU0:router (config) #  snmp-server timeouts duplicate 10
```

snmp-server trap authentication vrf disable

To disable authentication traps on VPNs, use the **snmp-server trap authentication vrf disable** command in

XR Config

mode.

snmp-server trap authentication vrf disable

Syntax Description

This command has no keywords or arguments.

Command Default

Authentication traps are enabled on VPNs by default.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to disable authentication traps on VPNs:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap authentication vrf disable
```

Related Topics

snmp-server vrf, on page 458

snmp-server trap link ietf

To enable the varbind used for linkUp and linkDown SNMP traps to utilize the RFC 2863 standard varbind, use the **snmp-server trap link ietf** command in

XR EXEC

mode. To restore the default value, use the **no** form of this command..

snmp-server trap link ietf
nosnmp-server trap link ietf

Syntax Description

This command has no keywords or arguments.

Command Default

The default varbind used is cisco.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For more information about linkUP and linkDown notifications, see RFC 2863, *The Interface Group MIB*, and RFC 3418, *Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)*.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the RFC 2863 standard varbind:

```
RP/0/RP0/CPU0:router# snmp-server trap link ietf
```

Related Topics

snmp-server engineid local, on page 407
snmp-server host, on page 413
snmp-server traps bgp
snmp-server traps snmp, on page 446
snmp-server traps syslog, on page 448

snmp-server trap throttle-time

To specify the throttle time for handling more Simple Network Management Protocol (SNMP) traps, use the **snmp-server trap throttle-time** command in

XR Config

mode. To restore the throttle time to its default value, use the **no** form of this command.

snmp-server trap throttle-time *time*
no snmp-server trap throttle-time

Syntax Description

time	Throttle time in milliseconds. Values can be from 10 to 500.

Command Default

250

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the trap throttle time is set to 500 milliseconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap throttle-time 500
```

Related Topics

snmp-server throttle-time, on page 433

snmp-server traps

To enable Simple Network Management Protocol (SNMP) trap notifications, use the **snmp-server traps** command in

XR Config

mode. To disable SNMP notifications, use the **no** form of this command.

snmp-server traps *notification-type*
no snmp-server traps [*notification-type*]

Syntax Description *notification-type*

(Optional) Type of notification (trap) to enable or disable. If no type is specified, all notifications available on the device are enabled or disabled.

The notification type can be one or more of the following keywords:

bfd

Enables Bidirectional Forwarding Detection (BFD) traps.

bgp

Enables BGP4-MIB and CISCO-BGP4-MIB traps.

bridgemib

Enables SNMP traps for the Bridge MIB.

config

Controls configuration notifications, as defined in the CISCO-CONFIG-MAN-MIB (enterprise 1.3.6.1.4.1.9.9.43.2). The notification type is: (1) ciscoConfigManEvent.

copy-complete

Enables CISCO-CONFIG-COPY-MIB ccCopyCompletion traps.

ds1

Enables SNMP Cisco DS1 traps.

ds2

Enables SNMP Cisco DS2 traps.

entity

Controls Entity MIB modification notifications. This notification type is defined in the ENTITY-MIB (enterprise 1.3.6.1.2.1.47.2) as: (1) entConfigChange.

ethernet

Enables Ethernet link OAM and 802.1ag connectivity fault management traps.

flash insertion

Enables ciscoFlashDeviceInsertedNotif.

flash removal

Enables ciscoFlashDeviceRemovedNotif.

fru-ctrl

Enables SNMP entity field-replaceable unit (FRU) control traps.

hsrp

Enables SNMP HSRP traps.

ipsec tunnel start

Enables SNMP IPsec tunnel start traps.

ipsec tunnel stop

Enables SNMP IPsec tunnel stop traps.

isakmp

Enables ISAKMP traps.

l2vpn all

Enables all Layer 2 VPN traps.

l2vpn vc-down

Enables Layer 2 VPN VC down traps.

l2vpn vc-up

Enables Layer 2 VPN VC up traps.

mpls frr all

Enables all MPLS fast reroute MIB traps.

mpls frr protected

Enables MPLS fast reroute tunnel protected traps.

mpls ldp

Enables SNMP Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) traps.

mpls traffic-eng

Enables SNMP MPLS traffic engineering traps.

msdp peer-state-change

Enables SNMP MSDP Peer state change traps.

ntp

Enables SNMP Cisco NTP traps.

otn

Enables SNMP Cisco optical transport network (OTN) traps.

pim

Enables SNMP PIM traps.

rf

Enables RF-MIB traps.

sensor

Enables SNMP entity sensor traps.

snmp

Enables SNMP traps.

sonet

Enables SONET traps.

syslog

Controls error message notifications (Cisco-syslog-MIB). Specify the level of messages to be sent with the **logging history** command.

system

Enables SNMP SYSTEMMIB-MIB traps.

vpls

Enables virtual private LAN service (VPLS) traps.

vrrp events

Enables Virtual Router Redundancy Protocol (VRRP) traps.

Note To display the trap notifications supported on a platform, use the online help (**?**) function.

Command Default

SNMP notifications are disabled by default.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	The **ds1** , **ds3** , **otn** , , and **vrrp events** keywords were introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server traps** command to enable trap requests for the specified notification types. To configure the router to send SNMP notifications, specify at least one **snmp-server traps** command. When the command is entered with no keyword, all notification types are enabled. When a notification type keyword is specified, only the notification type related to that keyword is enabled. To enable multiple types of notifications, issue a separate **snmp-server traps** command for each notification type.

More information about individual MIBs can be found in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

Some SNMP trap notifications require additional Task IDs as indicated in the following table:

Notification Type	Task ID	Operations
bfd	bgp	read, write
	ospf	read, write
	isis	read, write
	mpls-te	read, write
	snmp	read, write
bgp	bgp	read, write
copy-complete	config-services	read, write
ipsec	crypto	read, write
isakmp	crypto	read, write
l2vpn	l2vpn	read, write
mpls frr	mpls-ldp	read, write
	mpls-te	read, write
mpls l3vpn	ipv4	read, write
	mpls-ldp	read, write
	mpls-te	read, write
mpls ldp	mpls-ldp	read, write
	mpls-te	read, write
mpls traffic-eng	mpls-ldp	read, write
	mpls-te	read, write
ospf	ospf	read, write
syslog	sysmgr	read, write
vpls	l2vpn	read, write

This example shows how to enable the router to send all traps to the host specified by the name myhost.cisco.com, using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public
```

Related Topics

snmp-server host, on page 413

snmp-server traps bgp
snmp-server traps snmp, on page 446
snmp-server traps syslog, on page 448

snmp-server traps snmp

To enable the sending of RFC 1157 Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps snmp** command in the appropriate configuration mode. To disable RFC 1157 SNMP notifications, use the **no** form of this command.

snmp-server traps snmp [{**authentication** | **coldstart** | **linkdown** | **linkup** | **warmstart**}]
no snmp-server traps snmp [{**authentication** | **coldstart** | **linkdown** | **linkup** | **warmstart**}]

Syntax Description

authentication	(Optional) Controls the sending of SNMP authentication failure notifications.
linkup	(Optional) Controls the sending of SNMP linkUp notifications
linkdown	(Optional) Controls the sending of SNMP linkDown notifications
coldstart	(Optional) Controls the sending of SNMP coldStart notifications.
warmstart	(Optional) Controls the sending of SNMP warmStart notifications.

Command Default

SNMP notifications are disabled by default.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server traps snmp** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

The optional **authentication** keyword controls the sending of SNMP authentication failure notifications. In order to send notifications, you must configure at least one **snmp-server host** command. An authentication Failure (4) trap signifies that the sending device is the addressee of a protocol message that is not properly authenticated. The authentication method depends on the version of SNMP being used. For SNMPv1 or SNMPv2, authentication failure occurs for packets with an incorrect community string. For SNMPv3, authentication failure occurs for packets with an incorrect Secure Hash Algorithm (SHA) or Message Digest 5 (MD5) authentication key or for a packet that is outside the authoritative SNMP engine's window, for example, the packets that are configured outside access lists or time ranges. In such an instance, only a report Protocol Data Unit (PDU) is generated, and authentication failure traps are not generated.

The optional **linkup** keyword controls the sending of SNMP linkUp notifications. The linkUp(3) trap signifies that the sending device recognizes one of the communication links represented in the agent's configuration coming up.

The optional **linkdown** keyword controls the sending of SNMP linkDown notifications. The linkDown(2) trap signifies that the sending device recognizes a failure in one of the communication links represented in the agent's configuration.

The **snmp-server traps snmp** command with the **linkup** or **linkdown** keywords globally enables or disables SNMP linkUp and linkDown traps. After enabling either of these traps globally, you can enable or disable these traps on specific interfaces using the **no notification linkupdown disable** command in interface configuration mode. According to RFC 2863, linkUp and linkDown traps are enabled for interfaces that do not operate on top of any other interface (as defined in the ifStackTable), and are disabled otherwise. This means that you do not have to enable linkUp and linkdown notifications on such interfaces. However, linkUp and linkDown notifications will not be sent unless you enable them globally using the **snmp-server traps snmp** command.

The optional **coldstart** keyword controls the sending of SNMP coldStart notifications. The coldStart(0) trap signifies that the sending device is reinitializing itself such that the agent's configuration or the protocol entity implementation may be altered.

The optional **warmstart** keyword controls the sending of SNMP coldStart notifications. The warmStart(1) trap signifies that the sending device is reinitializing itself such that neither the agent configuration nor the protocol entity implementation is altered.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the device to send all traps to the host myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public snmp
```

The following example shows how to enable only linkUp and linkDown traps:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp linkup
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp linkdown
```

Related Topics

snmp-server engineid local, on page 407
snmp-server host, on page 413
snmp-server traps bgp
snmp-server traps syslog, on page 448

snmp-server traps syslog

To enable Simple Network Management Protocol (SNMP) notifications of Cisco-syslog-MIB error messages, use the **snmp-server traps syslog** command in the appropriate configuration mode. To disable these types of notifications, use the **no** form of this command.

snmp-server traps syslog
no snmp-server traps syslog

Syntax Description

This command has no keywords or arguments.

Command Default

SNMP notifications are disabled by default.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server traps syslog** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enable Cisco-syslog-MIB error message notifications to the host at the address myhost.cisco.com, using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps syslog
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Topics

snmp-server engineid local, on page 407
snmp-server host, on page 413
snmp-server traps bgp
snmp-server traps snmp, on page 446

snmp-server trap-source

To specify the interface (and hence the corresponding IP address) from which a Simple Network Management Protocol (SNMP) trap should originate, use the **snmp-server trap-source** command in

XR Config

mode. To remove the source designation, use the **no** form of this command.

snmp-server trap-source *type interface-path-id*
no snmp-server trap-source

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

No interface is specified.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When an SNMP trap is sent from a Cisco SNMP device, it has a notification address of the interface it happened to exit at that time. Use the **snmp-server trap-source** command to monitor notifications from a particular interface.

Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is and the module is CPU0. Example: interface .

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to specify that the IP address for interface 0/0/1/0 is the source for all SNMP notifications:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap-source tengige 0/0/1/0
```

Related Topics

snmp-server engineid local, on page 407
snmp-server host, on page 413
snmp-server traps bgp
snmp-server traps snmp, on page 446
snmp-server traps syslog, on page 448

snmp-server trap-timeout

To define how often to try resending trap messages on the retransmission queue, use the **snmp-server trap-timeout** command in

XR Config

mode. To restore the default value, use the **no** form of this command.

snmp-server trap-timeout *seconds*
no snmp-server trap-timeout *seconds*

Syntax Description

seconds	Integer that sets the interval for resending the messages, in seconds). Value can be from 1 to 1000.

Command Default

seconds : 30

Command Modes

Global configuration

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Before Cisco IOS XR software tries to send a trap, it looks for a route to the destination address. If there is no known route, the trap is saved in a retransmission queue. Use the **snmp-server trap-timeout** command to determine the number of seconds between retransmission attempts.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to set an interval of 20 seconds to try resending trap messages on the retransmission queue:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap-timeout 20
```

Related Topics

snmp-server engineid local, on page 407
snmp-server host, on page 413

snmp-server traps bgp
snmp-server traps snmp, on page 446
snmp-server traps syslog, on page 448

snmp-server user

To configure a new user to a Simple Network Management Protocol (SNMP) group, use the **snmp-server user** command in

XR Config

mode. To remove a user from an SNMP group, use the **no** form of this command.

snmp-server user *username groupname* {**v1** | **v2c** | **v3** [**auth** {**md5** | **sha**} {**clear** | **encrypted**} *auth-password* [**priv** {**3des** | **aes** *aes-bit-encryption* | **des56**} {**clear** | **encrypted**} *priv-password*]]} [{**SDROwner** | **SystemOwner**}] [*access-list-name*]
no snmp-server user *username groupname*

Syntax Description

username	Name of the user on the host that connects to the agent. **Note** The recommended range for a user-defined username is 2-253 characters.
groupname	Name of the group to which the user belongs.
v1	Specifies that the SNMPv1 security model should be used.
v2c	Specifies that the SNMPv2c security model should be used.
v3	Specifies that the SNMPv3 security model should be used.
auth	(Optional) Specifies which authentication level should be used. If this keyword is used, you must specify an authentication level and an authorization password.
md5	Specifies the HMAC-MD5-96 authentication level.
sha	Specifies the HMAC-SHA-96 authentication level.
clear	Specifies that an unencrypted password follows.
encrypted	Specifies that an encrypted password follows.
auth-password	Authentication password, which is a string (not to exceed 64 characters) that enables the agent to receive packets from the host.
priv	(Optional) Specifies that encryption parameters follow.
3des	Specifies the 168-bit Triple Data Encryption Standard (3DES) level of encryption for the user.
aes *aes-bit-encryption*	Specifies the Advanced Encryption Standard (AES) level of encryption for the user. Supported options are 128, 192 and 256 bit encryption.
des56	Specifies the 56-bit Data Encryption Standard (DES) level of encryption for the user.

priv-password	Privacy password, which can be clear or encrypted text, according to what is specified.
SDROwner	(Optional) Limits access to the agents for the owner secure domain router (SDR) only.
SystemOwner	(Optional) Provides system-wide access to the agents for all SDRs.
access-list-name	(Optional) Access list to be associated with this SNMP user. The *access-list-name* argument represents a value from 1 to 99, that is, the identifier of the standard IP access list.

Command Default

By default, access is limited to agents on the owner SDR only.

See also Table 37: snmp-server user Default Descriptions, on page 454.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	AES and 3DES encryption formats were supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To use 3DES and AES encryption standards, you must have installed the security package (k9sec). For information on installing software packages, see *Upgrading and Managing Cisco IOS XR Software* in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

Note Only one remote host can be assigned to the same username for SNMP version 3. If you configure the same username with different remote hosts, only the last username and remote host combination will be accepted and will be seen in the **show running** configuration. In the case of multiple SNMP managers, multiple unique usernames are required.

Table 37: snmp-server user Default Descriptions

Characteristic	Default
passwords	Text strings are assumed.
access lists	Access from all IP access lists is permitted.

SDR and System-wide Access

When the **snmp-server user** command is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the **snmp-server user** command is entered with the **SystemOwner** keyword, SNMP access is granted to .

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enter a plain-text password for the string *abcd* for user2 in group2:

```
RP/0/RP0/CPU0:router(config)# snmp-server user user2 group2 v3 auth md5 clear abcd
```

To learn if this user has been added to the configuration, use the **show snmp user** command.

If the localized Message Digest 5 (MD5) or Secure Hash Algorithm (SHA) digest is known, specify that string instead of the plain-text password. The digest should be formatted as AA:BB:CC:DD where AA, BB, CC, and DD are hexadecimal values. The digest should also be exactly 16 octets long.

This example shows how to specify the command with a digest name of 00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF:

```
RP/0/RP0/CPU0:router(config)# snmp-server user user2 group2 v3 auth md5 encrypted
     00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF
```

Related Topics

snmp-server group, on page 410

snmp-server view

To create or update a Simple Network Management Protocol (SNMP) view entry, use the **snmp-server view** command in

XR Config

mode. To remove the specified server view entry, use the **no** form of this command.

snmp-server view *view-name oid-tree* {**excluded** | **included**}
no snmp-server view *view-name oid-tree* {**excluded** | **included**}

Syntax Description

view-name	Label for the view record being updated or created. The name is used to reference the record.
oid-tree	Object identifier (OID) of the ASN.1 subtree to be included or excluded from the view. To identify the subtree, specify a text string consisting of numbers, such as 1.3.6.2.4, or a word, such as *system*. Replace a single subidentifier with the asterisk (*) wildcard to specify a subtree family; for example 1.3.*.4.
excluded	Excludes the MIB family from the view.
included	Includes the MIB family in the view.

Command Default

No view entry exists.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Other SNMP commands require a view as a keyword. Use the **snmp-server view** command to create a view to be used as keywords for other commands that create records including a view.

Instead of defining a view explicitly, you can rely on the following predefined views, which are supported by the SNMP agent:

all

Predefined view indicating that a user can see all objects.

CfgProt

Predefined view indicating that a user can see all objects except the SNMPv3 configuration tables.

vacmViewTreeFamilyEntry

Predefined view indicating that a user can see the default configuration of vacmViewTreeFamilyEntry.

The predefined views supported on Cisco IOS XR software, however, do not match the predefined views specified in RFC 3415.

Task ID

Task ID	Operations
snmp	read, write

This example creates a view that includes all objects in the MIB-II subtree:

```
RP/0/RP0/CPU0:router(config)# snmp-server view mib2 1.3.6.1.2.1 included
```

This example shows how to create a view that includes all objects in the MIB-II system group and all objects in the Cisco enterprise MIB:

```
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1 included
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.4.1.9 included
```

This example shows how to create a view that includes all objects in the MIB-II system group except for sysServices (System 7) and all objects for interface 1 in the MIB-II interfaces group:

```
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1 included
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1.7 excluded
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.2.2.1.*.1 included
```

Related Topics

show snmp view, on page 395
snmp-server group, on page 410

snmp-server vrf

To configure the VPN routing and forwarding (VRF) properties of Simple Network Management Protocol (SNMP), use the **snmp-server vrf** command in

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mode. To remove the configuration, use the **no** form of this command.

snmp-server vrf *vrf-name*[**host** *address* [{**clear**|**encrypted**}][**traps**][**version** {**1**|**2c**|**3** *security-level*}] *community-string*[**udp-port** *port*]][**context** *context-name*]
no snmp-server vrf *vrf-name*

Syntax Description

vrf-name	Name of the VRF.
host *address*	(Optional) Specifies the name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the *community-string* argument is encrypted text.
traps	(Optional) Specifies that notifications should be sent as traps. This is the default.
version {**1** | **2c** | **3**}	(Optional) Specifies the version of the SNMP used to send the traps. The default is SNMPv1. When the **version** keyword is used, one of these keywords must be specified: • **1**—SNMPv1 • **2c**—SNMPv2C • **3**—SNMPv3
security-level	(Optional) Security level for SNMPv3. Options are: • **auth**—authNoPriv • **noauth**—noAuthNoPriv • **priv**—authPriv
community-string	Specifies the community string for SNMPv1 and SNMPv2, or the SNMPv3 user.
udp-port *port*	(Optional) Specifies the UDP port to which notifications should be sent.
context *context-name*	(Optional) Name of the context that must be mapped to VRF identified by value of the *vrf-name* argument.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to enter SNMP VRF configuration mode and configure an SNMP notification recipient on a VRF. You can also map a VRF to an SNMP context.

SNMP notification recipient that is reachable by way of a VRF can be configured. Notification is forwarded to the recipient represented by its address using the routing table instance identified by the VRF name.

The *address* argument can be either a host name or an IP address. Both IPv4 and IPv6 formats are supported.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

An SNMP context identified by the value of the *context-name* argument can be mapped to a VRF in this mode. This context must be created using **snmp-server context** command.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure a host IP address for a VRF name:

```
RP/0/RP0/CPU0:router(config)# snmp-server vrf vrfa
RP/0/RP0/CPU0:router(config-snmp-vrf)# host 12.21.0.1 traps version
2c public udp-port 2525
```

Related Topics

snmp-server context, on page 402
snmp-server host, on page 413

snmp test trap all

To send a Simple Network Management Protocol (SNMP) trap message to the trap receivers for all supported traps, use the **snmp test trap all** command in

XR EXEC

XR EXEC

mode.

snmp test trap all

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To use the **snmp test trap** command, SNMP must be configured on the router. This command is not intended for testing scalability, performance, or high availability scenarios.

Use the **snmp test trap all** command to generate test traps for all supported traps. The following traps are supported:

- coldStart—SNMP agent Initializing and its configuration may have changed.
- warmStart—SNMP agent Initializing and its configuration is unaltered.
- linkUp—Interface ifOperStatus is Up.
- linkDown—Interface ifOperStatus is Down.
- clogMessage Generated—Syslog message generated.
- ciscoFlashDeviceInsertedNotif—Flash device inserted.
- ciscoFlashDeviceRemovedNotif—Flash device removed.
- ciscoRFProgressionNotif—RF state change.
- ciscoRFSwactNotif—Switchover.
- ciscoConfigManEvent—Command-line interface (CLI) configuration management event.
- newRoot—SNMP agent is a new root of the spanning tree.

- topologyChange—Bridge port has transitioned to the Forwarding state.
- cefcFanTrayOperStatus—Fan tray cefcFanTrayOperStatus is Up.
- cefcModuleStatusChange—Module cefcModuleOperStatus is OK (module up) or module cefcModuleOperStatus is Failed (module down).
- entSensorThresholdNotification—entSensorValue crossed the entSensorthresholdValue.
- cefcPowerStatusChange—Redundant PowerSupply fails.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap all** command:

```
RP/0/RP0/CPU0:router# snmp test trap all
```

Related Topics

show snmp entity, on page 381

snmp test trap entity

To send a test SNMP Entity trap message to the trap receivers, use the **snmp test trap entity** command in

XR EXEC

mode.

snmp test trap entity {**fru** {**power status-change failed** | **module status-change** {**up** | **down**} | **fan-tray oper-status up**} | **sensor threshold-notification**}[**entity-index** *index*]

Syntax Description

fru	Sends a field replacement unit trap.
power status-change failed	Sends a cefcPowerStatusChange trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
module status-change{**up** | **down**}	Sends a cefcModuleStatusChange trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
fan-tray oper-status up	Sends a cefcFanTrayOperStatus trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
sensor	Sends a sensor trap.
threshold-notification	Sends a entSensorThresholdNotification trap for the CISCO-ENTITY-SENSOR-MIB.
entity-index *index*	Specifies the physical index for which to generate the trap.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap entity** command tests the sending of Entity MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use the **snmp test trap** command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap entity** command:

```
RP/0/RP0/CPU0:router# snmp test trap entity sensor threshold index
```

Related Topics

show snmp entity, on page 381

snmp test trap infra

To send a test Simple Network Management Protocol (SNMP) Infra trap message to the trap receivers, use the **snmp test trap infra** command in

XR EXEC

mode.

snmp test trap infra {**bridge** {**new-root** | **topology-change**} | **config event** | **flash** {**device-inserted** | **device-removed**} | **redundancy** {**progression** | **switch**} | **syslog message-generated**}

Syntax Description

bridge	Sends a bridge trap.
new-root	Sends a newRoot trap for the BRIDGE-MIB.
topology-change	Sends a topologyChange trap for the BRIDGE-PORT.
config event	Sends a ciscoConfigManEvent trap for the CISCO-CONFIG-MAN-MIB.
flash	Sends a flash trap.
device-inserted	Sends a ciscoFlashDeviceInsertedNotif trap for the CISCO-FLASH-MIB.
device-removed	Sends a ciscoFlashDeviceRemovedNotif trap for the CISCO-FLASH-MIB.
redundancy	Sends an RF trap.
progression	Sends a ciscoRFProgressionNotif trap for the CISCO-RF-MIB.
switch	Sends a ciscoRFSwactNotif trap for the CISCO-RF-MIB.
syslog message-generated	Sends a clogMessageGenerated for the CISCO-SYSLOG-MIB.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap infra** command tests the sending of Infra MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap infra** command:

```
RP/0/RP0/CPU0:router# snmp test trap infra syslog message-generated
```

snmp test trap interface

To send a test Simple Network Management Protocol (SNMP) interface trap message to the trap receivers, use the **snmp test trap interface** command in

XR EXEC

mode.

snmp test trap interface {**link-down** | **link-up**}**ifindex** *index*

Syntax Description

link-down	Sends a linkDown trap for the IF-MIB.
link-up	Sends a linkUp trap for the IF-MIB.
ifindex *index*	Specifies the interface index for which to send the IF-MIB trap.

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap interface** command tests the sending of IF-MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap interface** command:

```
RP/0/RP0/CPU0:router# snmp test trap interface link-down
```

snmp test trap snmp

To send a test Simple Network Management Protocol (SNMP) trap message to the trap receivers, use the **snmp test trap snmp** command in

XR EXEC

mode.

snmp test trap snmp {**cold-start** | **warm-start**}

Syntax Description

cold-start	Sends a coldStart trap for the SNMPv2-MIB.
warm-start	Sends a warmStart trap for the SNMPv2-MIB.

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap snmp** command tests the sending of MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

The following example illustrates how to use the **snmp test trap snmp** command:

```
RP/0/RP0/CPU0:router# snmp test trap snmp cold-start
```

transfer-interval

To configure how long bulk statistics should be collected before a bulk statistics transfer is initiated, use the **transfer-interval** command in bulk statistics transfer configuration mode. To remove a previously configured interval from a bulk statistics configuration, use the **no** form of this command.

transfer-interval *minutes*
no transfer-interval *minutes*

Syntax Description

minutes	Length of time, in minutes, that the system should collect MIB data before attempting the transfer operation. The valid range is from 1 to 2147483647. The default is 30.

Command Default

Bulk statistics file transfer operations start 30 minutes after the **enable (bulkstat)** command is used.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Bulk statistics data is collected into a new file when a transfer attempt begins, which means that this command also configures the collection interval.

If the maximum buffer size for a bulk statistics file is reached before the transfer interval time expires, the transfer operation is still initiated, and bulk statistics MIB data are collected into a new file in the system buffer.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a transfer interval of 20 minutes for the bulk statistics configuration bulkstat1:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# transfer-interval 20
```

Related Topics

enable (bulkstat), on page 355
show snmp mib bulkstat transfer, on page 390

snmp-server mib bulkstat transfer-id, on page 424

url

To specify the host to which bulk statistics files should be transferred, use the **url** command in bulk statistics transfer configuration mode. To remove a previously configured destination host, use the **no** form of this command.

url [{**primary** | **secondary**}] *url*
no url [{**primary** | **secondary**}] *url*

Syntax Description

primary	Specifies the URL to be used first for bulk statistics transfer attempts.
secondary	Specifies the URL to be used for bulk statistics transfer attempts if the transfer to the primary URL is not successful.
url	Destination URL address for the bulk statistics file transfer. Use FTP or TFTP. The syntax for these URLs is as follows: • **ftp:**[[[//*username* [:*password*]**@**]*location*]/*directory*]/*filename* • **tftp:**[[/*location*]/*directory*]/*filename* The location argument is typically an IP address.

Command Default

No host is specified.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For bulk statistics transfer retry attempts, a single retry consists of an attempt to send first to the primary URL, and then to the secondary URL.

Task ID

Task ID	Operation
snmp	read, write

In the following example, an FTP server is used as the primary destination for the bulk statistics file. If a transfer to that address fails, an attempt is made to send the file to the TFTP server at 192.168.10.5. No retry command is specified, which means that only one attempt to each destination will be made.

```
RP/0/RP0/CPU0:router# configure
```

```
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer ifMibTesting
RP/0/RP0/CPU0:router(config-bulk-tr)# schema carMibTesting1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema carMibTesting2
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user2:pswd@192.168.10.5/functionality/

RP/0/RP0/CPU0:router(config-bulk-tr)# url secondary tftp://user2@192.168.10.8/tftpboot/
RP/0/RP0/CPU0:router(config-bulk-tr)# enable
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

show snmp mib bulkstat transfer, on page 390

Network Configuration Protocol Commands

This chapter includes commands to configure the Network Configuration (Netconf) Protocol. More details on the Netconf protocol and the Yang model, please see the *System Security Configuration Guide for Cisco NCS 6000 Series Routers*.

- clear netconf-yang agent session, on page 474
- clear netconf-yang agent rate-limit, on page 475
- netconf-yang agent ssh , on page 476
- netconf-yang agent session, on page 477
- netconf-yang agent rate-limit, on page 478
- netconf-yang agent yfw idle-timeout , on page 479
- show netconf-yang clients, on page 480
- show netconf-yang rate-limit, on page 482
- show netconf-yang statistics, on page 483
- ssh server netconf port, on page 485
- ssh server capability netconf-xml, on page 486

clear netconf-yang agent session

To clear the specified netconf agent session, use the **clear netconf-yang agent session** in XR EXEC mode.

clear netconf-yang agent session *session-id*

Syntax Description

session-id	The session-id which needs to be cleared.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

The **show netconf-yang clients** command can be used to get the required session-id(s).

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to use the **clear netconf-yang agent session** command:

```
RP/0/RP0/CPU0:router (config) #  clear netconf-yang agent session 32125
```

clear netconf-yang agent rate-limit

To clear the set rate-limit statistics, use the **clear netconf-yang agent rate-limit** command in the appropriate mode.

clear netconf-yang agent rate-limit

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes EXEC

Command History

Release	Modification
Release 5.3.1	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to use the **clear netconf-yang agent rate-limit** command:

```
RP/0/RP0/CPU0:router # clear netconf-yang agent rate-limit
```

netconf-yang agent ssh

To enable netconf agent over SSH (Secure Shell) , use the **netconf-yang agent ssh** command in XR Config mode. To disable netconf, use the **no** form of the command.

netconf-yang agent ssh

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

SSH is currently the supported transport method for Netconf.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to use the **netconf-yang agent ssh** command:

```
RP/0/RP0/CPU0:router (config) #  netconf-yang agent ssh
```

netconf-yang agent session

To set the session details (limits and timeouts) for a netconf-yang agent, use the **netconf-yang agent session** command in the appropriate mode. To remove the configured session limits and timeouts, use the **no** form of the command.

netconf-yang agent session { **limit** *value* | **absolute-timeout** *value* | **idle-timeout** *value* }
no netconf-yang agent session { **limit** *value* | **absolute-timeout** *value* | **idle-timeout** *value* }

Syntax Description

limit *value*	Sets the maximum count for concurrent netconf-yang sessions. Range is 1 to 1024.
absolute-timeout *value*	Enables session absolute timeout and sets the absolute session lifetime. Range is 1 to 1440. Unit is minutes.
idle-timeout *value*	Enables session idle timeout and sets the idle session lifetime. Range is 1 to 1440. Unit is minutes.

Command Default

By default, no limits are set

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read, write

Example

This command shows how to use the **netconf-yang agent session** command:

```
RP/0/RP0/CPU0:router (config) #   netconf-yang agent session limit
```

netconf-yang agent rate-limit

To set the rate-limit for the netconf yang agent, use the **netconf-yang agent rate-limit** command in the appropriate mode. To delete the set rate-limit, use the **no** form of the command.

netconf-yang agent rate-limit *bytes*
no netconf-yang agent rate-limit *bytes*

Syntax Description

bytes	The number of bytes to process per second. Range is 4096-4294967295. It is based on the size of the request(s) from the client to the netconf server.

Command Default

By default, no limit is set

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Use the **show netconf-yang rate-limit** command to check if the set limit is adequate.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to use the **netconf-yang agent rate-limit** command:

```
RP/0/RP0/CPU0:router # netconf-yang agent rate-limit 5000
```

netconf-yang agent yfw idle-timeout

To configure idle timeout value for the operational yang model use the **netconf-yang agent yfw idle-timeout** command. Idle timeout indicates the duration for which there is no netconf process activity. If the idle timeout value is configured, all the operational yang models that are not being used for the specified duration, are released from the memory.

netconf-yang agent yfw idle-timeout *time in seconds*

Syntax Description

Specify the time in seconds. The valid value must be between the range of 1 to 4294967295 seconds

Command Default

If this command is not configured, the operational yang models are not released from the memory. To manually release the yang models, the Netconf process should be restarted.

Command Modes

XR Config mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Example

This example shows how to use the **netconf-yang agent yfw idle-timeout** command:

```
RP/0/RP0/CPU0:router (config) #  netconf-yang agent yfw idle-timeout 60
```

show netconf-yang clients

To display the client details for netconf-yang, use the **show netconf-yang clients** command in XR EXEC mode.

show netconf-yang clients

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes XR EXEC mode

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show netconf-yang clients** command:

```
RP/0/RP0/CPU0:router (config) #  sh netconf-yang clients
Netconf clients
client session ID|   NC version|    client connect time|        last OP time|        last
OP type|    <lock>|
 22969|                    1.1|          0d  0h  0m  2s|            11:11:24|
close-session|        No|
 15389|                    1.1|          0d  0h  0m  1s|            11:11:25|
get-config|        No|
```

Table 38: Field descriptions

Field name	Description
Client session ID	Assigned session identifier
NC version	Version of the Netconf client as advertised in the hello message
Client connection time	Time elapsed since the client was connected
Last OP time	Last operation time
Last OP type	Last operation type

Lock (yes or no)	To check if the session holds a lock on the configuration datastore

show netconf-yang rate-limit

To display the statistics of the total data dropped , due to the set rate-limit, use the **show netconf-yang rate-limit** command in the appropriate mode.

show netconf-yang rate-limit

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show netconf-yang rate-limit** command:

```
RP/0/RP0/CPU0:router # show netconf-yang rate-limit
rate-limit statistics
Total data dropped: 0 Bytes
```

show netconf-yang statistics

To display the statistical details for netconf-yang, use the **show netconf-yang statistics** command in XR EXEC mode.

show netconf-yang statistics

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes XR EXEC mode

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show netconf-yang statistics** command:

```
RP/0/RP0/CPU0:router (config) #  sh netconf-yang statistics
Summary statistics
                          # requests|             total time|   min time per request|   max
 time per request|   avg time per request|
other                              0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
close-session                      4|       0h  0m  0s   3ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
kill-session                       0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
get-schema                         0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
get                                0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
get-config                         1|       0h  0m  0s   1ms|       0h  0m  0s   1ms|
 0h  0m  0s   1ms|       0h  0m  0s   1ms|
edit-config                        3|       0h  0m  0s   2ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
commit                             0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
cancel-commit                      0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
lock                               0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
unlock                             0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
```

```
discard-changes                    0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
validate                           0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
xml parse                          8|       0h  0m  0s   4ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
netconf processor                  8|       0h  0m  0s   6ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
```

Table 39: Field descriptions

Field name	Description
Requests	Total number of processed requests of a given type
Total time	Total processing time of all requests of a given type
Min time per request	Minimum processing time for a request of a given type
Max time per request	Maximum processing time for a request of a given type
Avg time per request	Average processing time for a request type

ssh server netconf port

To configure a port for the netconf SSH server, use the **ssh server netconf port** command in XR Config mode. To return to the default port, use the **no** form of the command.

ssh server netconf port *port number*

Syntax Description

port *port-number*	Port number for the netconf SSH server (default port number is 830).

Command Default

The default port number is 830.

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.3.0	This command was introduced.
Release 6.0	The **ssh server netconf** command is no longer auto completed to configure the default port. This command is now optional

Usage Guidelines

Starting with IOS-XR 6.0.0 it is no longer sufficient to configure a netconf port to enable netconf subsystem support. ssh server netconf needs to be at least configured for one vrf.

Task ID

Task ID	Operations
crypto	read, write

Examples

This example shows how to use the ssh server netconf port command with port 831:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ssh
```

Related Commands

Command	Description
ssh server netconf	Configures the vrf(s), where netconf subsystem requests are to be received.
netconf-yang agent ssh	Configures the **ssh netconf-yang backend** for the netconf subsystem (Required to allow the system to service netconf-yang requests). For more information, see the *Cisco ASR 9000 Series Aggregation Services Router System Management Command Reference*.

ssh server capability netconf-xml

To enable NETCONF reach XML subsystem via port 22, use the **ssh server capability netconf-xml** command in in the XR Config mode. Use **no** form of this command to disable NETCONF reach XML subsystem.

ssh server capability netconf-xml

Syntax Description

This command has no keywords or arguments.

Command Default

Port 22 is the default port.

Command Modes

XR CONFIG

Command History

Release	Modification
Release 6.1.4	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
crypto	read, write

Software Package Management Commands

This chapter describes the Cisco IOS XR commands used to add packages to a router storage device, activate or deactivate packages, upgrade or downgrade existing packages, and display information about packages.

For detailed information about the concepts and tasks necessary to manage Cisco IOS XR software see .

- install activate, on page 488
- install add, on page 490
- install commit, on page 492
- install deactivate, on page 493
- install remove, on page 495
- install upgrade source , on page 497
- install verify packages, on page 500
- show install active, on page 503
- show install committed, on page 505
- show install health, on page 507
- show install inactive, on page 509
- show install issu inventory, on page 511
- show install issu stage, on page 512
- show install log, on page 513
- show install package, on page 515
- show install request, on page 517
- show issu-warm-reload control-protocol trace, on page 519
- show zapdisk locations, on page 521
- zapdisk start location, on page 522
- zapdisk set, on page 523
- zapdisk unset, on page 524

install activate

To add software functionality to the active software set, use the **install activate** command in System Admin EXEC mode or XR EXEC mode.

install activate {*package* | **id** *add-id*} [**noprompt**]

Syntax Description

package	Enter the package name(s) separated by space. Example: ncs6k.iso ncs6k_upgrade.iso **Note** Multiple packages can be activated at one time. Up to 64 packages can be specified in a single **install activate** command. However, the number of packages is limited based on the length of the character entered. The character length should not exceed 1024.
id *add-id*	Specifies the ID number of an **install add** operation. The command activates all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 64 **install add** operations can be specified.
noprompt	(Optional) Sets Yes to any response prompted from an install operation when this keyword is used in the command. **Note** The command functionality remains unaltered even if the keyword is not specified.

Command Default

The **install activate** command can be executed without any keywords if the **install prepare** is already executed.

Command Modes

System Admin EXEC mode

XR EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 6.1.2	Support for **noprompt** keyword was added.

Usage Guidelines

Use the **install activate** command to activate ISO images, software packages or SMUs for all valid cards. Information within the package is used to verify compatibility with the target cards and with the other active

software. Actual activation is performed only after the package compatibility and application program interface (API) compatibility checks have passed.

Specifying Packages to Activate

You can either use the **id** *add-id* keyword and argument to activate all packages that were added in one or more specific **install add** operations, or specify packages by name. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Note Activating a Software Maintenance Update (SMU) does not cause any earlier SMUs, or the package to which the SMU applies, to be automatically deactivated.

Task ID

Task ID	Operations
pkg-mgmt	execute

This example shows how to activate a package:

```
sysadmin-vm:0_RP0#install activate ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
result Wed Sep 18 05:35:06 2013 Install operation 8 (install activate) started by user
'root' will continue asynchronously.
sysadmin-vm:0_RP0# 0/3:Sep 18 00:35:09.189 : pm[1736]:
%INFRA-Process_Manager-3-PROCESS_RESTART : Process slice_manager restarted
LC/0/3/CPU0:Sep 18 00:37:39.942 : npu_driver[122]: %PLATFORM-NPU-3-SW_ERROR : Slice Manager
 disconnect notification received, Success
sysadmin-vm:0_RP0# Wed Sep 18 05:36:10 2013 Install operation 8 completed successfully.
sysadmin-vm:0_RP0# 0/RP0:Sep 18 00:36:10.075 : inst_mgr[3768]:
%INFRA-INSTMGR-6-OPERATION_SUCCESS : Install operation 8 completed successfully
```

Related Topics

install add, on page 490
install deactivate, on page 493
install commit, on page 492

install add

To copy the contents of the ISO image, package, and SMUs to the software repository, use the **install add** command in System Admin EXEC mode or XR EXEC mode.

install add source *source-path package-name*

Syntax Description

source *source*	Specifies the source location of the packages. The source location can be one of the following: • **harddisk:** • **ftp:**//*username@server:/package_path* • **tftp:**//*package_path*
package name	Enter the package name(s) separated by space. Example: tftp://server/directory/ file1 file2 file3

Command Default

Packages are added to the software repository, but are not activated.

The operation is performed in asynchronous mode. The **install add** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

XR EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.
Release 5.0.1	Support of ftp and sftp protocols was introduced.

Usage Guidelines

Use the **install add** command to unpack the package software files from an ISO image, tar file, package, and SMUs and copy them to the software repository.

Task ID

Task ID	Operations
pkg-mgmt	execute

This example shows how to add a package:

```
sysadmin-vm:0_RP0#install add source
tftp://223.255.254.254/auto/tftp-infra/wmori/ng-install/images/40I/sysadmin-smu/
ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i.smu
result Wed Sep 18 05:06:24 2013 Install operation 3 (install add) started by user 'root'
will continue asynchronously.
sysadmin-vm:0_RP0# Wed Sep 18 05:06:30 2013 Install operation 3 completed successfully.
sysadmin-vm:0_RP0# 0/RP0:Sep 18 00:06:30.471 : inst_mgr[3768]:
%INFRA-INSTMGR-6-OPERATION_SUCCESS : Install operation 3 completed successfully
```

Related Topics

install activate, on page 488
show install log, on page 513
show install request, on page 517
install commit, on page 492

install commit

To save the active software set to be persistent across designated system controller (DSC) reloads, use the **install commit** command in System Admin EXEC mode or XR EXEC mode.

install commit [{**location** *node-id*}]

Syntax Description

location *node-id*	(Optional. System Admin EXEC mode mode only.)Specifies a node. The *node-id* argument is expressed in *rack/slot* notation.

Command Default

System Admin EXEC mode: Commits the active software set for all SDRs.

Command Modes

System Admin EXEC mode

XR EXEC mode

Command History

Release	Modification
Release 5.2.1	This command was introduced.

Usage Guidelines

When a package is activated, it becomes part of the current running configuration. To make the package activation persistent across designated secure domain router shelf controller (DSDRSC) reloads, enter the **install commit** command. On startup, the DSDRSC of the SDR loads this committed software set.

If the system is restarted before the active software set is saved with the **install commit** command, the previously committed software set is used.

Task ID

Task ID	Operations
pkg-mgmt	read, write

The following example shows how to make the current active software set persistent across DSDRSC reloads for all SDRs in the system:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install commit

Install operation 16 'install commit' started by user 'user_b' at 19:18:58 UTC
Sat Apr 08 2006.
Install operation 16 completed successfully at 19:19:01 UTC Sat Apr 08 2006.
```

Related Topics

show install log, on page 513
show install committed, on page 505

install deactivate

To remove a package from the active software set, use the **install deactivate** command in System Admin EXEC mode or XR EXEC mode.

install deactivate {*package* | **id** *add-id*} [**noprompt**]

Syntax Description

package	Enter the package name(s) separated by space. Example: ncs6k.iso ncs6k_upgrade.iso **Note** Multiple packages can be deactivated at one time. Up to 64 packages can be specified in a single **install deactivate** command. However, the number of packages is limited based on the length of the character entered. The character length should not exceed 1024.
id *add-id*	Specifies the ID number of an **install add** operation. The command deactivates all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified.
noprompt	(Optional) Sets Yes to any response prompted from an install operation when this keyword is used in the command. **Note** The command functionality remains unaltered even if the keyword is not specified.

Command Default

The **install deactivate** operation is performed in asynchronous mode: The command runs in the background, and the router prompt is returned as soon as possible.

Command Modes

System Admin EXEC mode

XR EXEC mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.
Release 6.1.2	Support for **noprompt** keyword was added.

Usage Guidelines

Deactivating a package removes the activated package from the active software set from all nodes. When a deactivation is attempted, the system runs an automatic check to ensure that the package is not required by other active packages. The deactivation is permitted only after all compatibility checks have passed.

The following conditions apply to software deactivation:

- A feature package cannot be deactivated if active packages need it to operate.

Specifying Packages to Deactivate

You can either use the **id** *add-id* keyword and argument to deactivate all packages that were added in one or more specific **install add** operations, or specify packages by name. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Router Reloads

If the deactivation requires a router reload, a confirmation prompt appears.

Task ID

Task ID	Operations
pkg-mgmt	execute

This example shows how to deactivate a package:

```
sysadmin-vm:0_RP0#install deactivate ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
result Wed Sep 18 05:45:49 2013 Install operation 9 (install deactivate) started by user
'root' will continue asynchronously.
sysadmin-vm:0_RP0# LC/0/3/CPU0:Sep 18 00:48:22.153 : npu_driver[122]: %PLATFORM-NPU-3-SW_ERROR
 : Slice Manager disconnect notification received, Success
0/3:Sep 18 00:45:50.978 : pm[1736]: %INFRA-Process_Manager-3-PROCESS_RESTART : Process
slice_manager restarted
Wed Sep 18 05:45:51 2013 Install operation 9 completed successfully.
sysadmin-vm:0_RP0# 0/RP0:Sep 18 00:45:51.260 : inst_mgr[3768]:
%INFRA-INSTMGR-6-OPERATION_SUCCESS : Install operation 9 completed successfully
```

Related Topics

install activate, on page 488
install remove, on page 495
show install inactive, on page 509
show install log, on page 513
show install request, on page 517
install commit, on page 492

install remove

To delete inactive packages from the software repository, use the **install remove** command in System Admin EXEC orXR EXEC mode.

install remove {*package* | **id** *add-id*}

Syntax Description

package	Enter the package name(s) separated by space. Example: ncs6k.iso ncs6k_upgrade.iso **Note** Multiple packages can be removed at one time. Up to 64 packages can be specified in a single **install remove** command. However, the number of packages is limited based on the length of the character entered. The character length should not exceed 1024.
id *add-id*	Specifies the ID number of an **install add** operation. The command deletes all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified.

Command Default

The operation is performed in asynchronous mode: The **install remove** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Note Only inactive packages can be removed.

- To remove all packages that were added in one or more specific **install add** operations, use the **id** *add-id* keyword and argument. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Task ID

Task ID	Operations
pkg-mgmt	execute

This example shows how to remove a package:

```
sysadmin-vm:0_RP0#install remove ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
result Wed Sep 18 05:48:05 2013 Install operation 10 (install remove) started by user 'root'
 will continue asynchronously.
sysadmin-vm:0_RP0# 0/RP0:Sep 18 00:48:09.050 : inst_mgr[3768]:
%INFRA-INSTMGR-6-OPERATION_SUCCESS : Install operation 10 completed successfully
Wed Sep 18 05:48:09 2013 Install operation 10 completed successfully.
```

Related Topics

install add, on page 490
show install log, on page 513
show install inactive, on page 509
show install request, on page 517

install upgrade source

To upgrade the software package, use the **install upgrade source** command in administration EXEC mode.

install upgrade source [{**ftp** | **tftp***system-disk*}] [**path** *directory-path*] [{*file-name* | **version** *version-number* | **packages**}] *[source-file]* [**synchronous**] [**pause-reload**]

Syntax Description

source	Specify the source location of the PIE files to be appended to the PIE filenames. Location options are as follows: **ftp:** —Copies from an FTP network server. The syntax is **ftp:**[[[//*username* [:*password*]@] *location*]/*directory*]/*filename.* **tftp:** —Copies from a TFTP network server. The syntax is **tftp:**[[//*location*]/*directory*]/*filename* *system disk* —Copies package source from system disk. Location options are as follows: • **harddisk:** —Copies from the hard disk drive file system (if present). • **disk1:** —Copies from disk1: file system.
path *directory-path*	Specify the storage device and directory for the file search. The search is performed for the specified directory and all subdirectories in that directory tree. The syntax for directory-path is: *device :[/ directory-path]* If a directory path is not specified, then the search is performed in the current directory (a path of . [dot] is assumed).
file-name	Only for TFTP, with file that contains a list of packages to be installed **Note** Directory listing is not possible
version *version-number*	Specify the package version that is to be installed
packages	Specify the package names to install (packages can be *tar* file)
source-file	Specify the source location of the PIE files on the system
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to be completed before the prompt is returned. **Note** By default, installation operations are performed in asynchronous mode. In asynchronous mode, the command will run without expecting any user inputs while holding the prompt.

pause-reload	(Optional) Pauses the operation before any reload occurs. The configuration remains locked for the activation. This keyword precedes the following two keywords: • **pause-reload allow-sw-change**—The operation pauses before locking the configuration and provides the option to hold the operation while you perform configuration changes. You can proceed with the activation whenever you choose. • **pause-reload disallow-sw-change**—The operation pauses before reload but this will not allow you to make any configuration changes. **Note** These keywords are applicable for asynchronous and synchronous operations. In both cases, follow onscreen instructions to control the pausing and completion of the operation.

Command Default

By default **install upgrade source** picks active version packages.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 5.3.2	This command was introduced.

Usage Guidelines

FTP

Use the following options to upgrade the system using FTP as source:

- Only repository without version—It picks delta packages (ignoring optional packages) of the active version; that is, the difference between packages present in the file specified and packages active on the system.
- Repository with version—It picks packages of the specified version. If a mini package of the specified version is found in the file, it will upgrade the system, provided all dependency and package compatibility checks are completed successfully.
- Packages—Specifies the list of packages to add or upgrade the system. This option can be used to add *tar* files.

TFTP

Use the following options to upgrade the system using TFTP as source:

- File-name—This option requires the package list to be provided in a file, which can then be used to upgrade the system or update the packages or SMU's. It picks delta packages (ignoring optional packages) of the active version; that is, the difference between packages present in the file specified and packages active on the system.
- File-name with version—It picks packages of the specified version. If a mini package of the specified version is found in the file, it will upgrade the system, provided all dependency and package compatibility checks are completed successfully.

- Packages—Specifies the list of packages to add or upgrade the system. This option can be used to add *tar* files.

harddisk

Use the following options to upgrade the system using harddisk as source:

- Only repository without version—It picks delta packages (ignoring optional packages) of the active version; that is, the difference between packages present in the file specified and packages active on the system.
- Repository with version—It picks packages of the specified version. If a mini package of the specified version is found in the file, it will upgrade the system, provided all dependency and package compatibility checks are completed successfully.
- Packages—Specifies the list of packages to add or upgrade the system. This option can be used to add *tar* files.

Task ID

Task ID	Operation
pkg-mgmt	execute

Example

This example shows how to upgrade a package to 5.2.4 version with image asr9k-mini-px.pie-5.2.4 from the FTP repository, using the **install upgrade source** command:

```
RP/0/RP0/CPU0:router#admin
RP/0/RP0/CPU0:router(admin)#install upgrade source ftp://10.10.10.10/yum_like_upgrade
asr9k-mini-px.pie-5.2.4 synchronous
```

This example shows how to upgrade a package to 5.3.2 version from the on-system repository, using the **install upgrade source** command:

```
RP/0/RP0/CPU0:router#admin
RP/0/RP0/CPU0:router(admin)#install upgrade source harddisk:/images/532  version 5.3.2
synchronous
```

This example shows how to upgrade package to release 5.1.0 from the TFTP repository, using the **install upgrade source** command:

```
RP/0/RP0/CPU0:router#admin
RP/0/RP0/CPU0:router(admin)# install upgrade source tftp://10.10.10.10/auto/tftpboot/userid
 file-name packages.txt version 5.1.0  synchronous
```

This example shows how to add and activate the package or SMU of active version using the **install upgrade source** command:

```
RP/0/RP0/CPU0:router#admin
RP/0/RP0/CPU0:router(admin)# install upgrade source tftp://10.10.10.10/packages pkg1,pkg2
```

pkg1 is an optional package and pkg2 is a SMU. Both are active versions, but inactive on the system. The **install upgrade source** command checks whether the package or SMU is already inactive on system. If it is in inactive, the command skips its downloading, and adds as well as activates optional packages or SMUs along with its pre requisites.

install verify packages

To verify the consistency of a previously installed software set with the package file from which it originated, use the **install verify packages** command in administration EXEC mode.

Administration EXEC Mode:

install verify packages [**repair**] [**location** *node-id*] [**admin-plane**] [{**asynchronous** | **synchronous**}]

Syntax Description

repair	(Optional) Repairs anomalies found by the **install verify packages** process.
location *node-id*	(Optional) Verifies the consistency of previously installed software from the designated node with the package file from which it originated. The *node-id* argument is expressed in *rack/slot* notation.
admin-plane	(Optional) Verify the admin profile only.
asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, this command runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.

Command Default

The operation is performed in asynchronous mode: The **install verify packages** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.8.0	No modification.
Release 3.9.0	No modification.
Release 4.0.0	This command was removed from EXEC mode. Support was removed for the **sdr** keyword.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install verify packages** command to verify the consistency of a previously installed software set with the package file from which it originated. This command can be used as a debugging tool to verify the validity of the files that constitute the packages to determine if there are any corrupted files. This command also checks for corruptions of install state files and MBI image files. This command is particularly useful when issued after the activation of a package or when upgrading the Cisco IOS XR software to a major release.

Note The **install verify packages** command can take up to two minutes per package to process.

Task ID

Task ID	Operations
pkg-mgmt	execute

The following example shows how to verify the consistency of a previously installed software set with the package file from which it originated:

```
RP/0/RP0/CPU0:router# install verify packages

Install operation 2 '(admin) install verify packages' started by user 'admin' via CLI at
07:35:01 UTC Wed May 14 2008.
Info: This operation can take up to 2 minutes per package being verified. Please be patient.
Info: 0/3/CPU0 [LC] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/SM1/SP [SP] [Admin Resource]
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/3/SP [SP] [Admin Resource]
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/RP1/CPU0 [RP] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-rout-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/RP0/CPU0 [RP] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-rout-3.8.0.02I: [SUCCESS] Verification Successful.
Info: Verification Summary:
Info: 0/3/CPU0: SUCCESSFUL. No anomalies found.
Info: 0/SM1/SP: SUCCESSFUL. No anomalies found.
Info: 0/3/SP: SUCCESSFUL. No anomalies found.
Info: 0/RP1/CPU0: SUCCESSFUL. No anomalies found.
Info: 0/RP0/CPU0: SUCCESSFUL. No anomalies found.
Info: The system needs no repair.
```

```
Install operation 2 completed successfully at 07:46:29 UTC Wed May 14 2008
```

Related Topics

show install log, on page 513
show install request, on page 517

show install active

To display active packages, use the **show install active** command in System Admin EXEC or XR EXEC mode.

show install active

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **show install active** command to display the active software set for all nodes.

For Superceded SMUs

The **show install active** command doesnot display superceded SMUs. To get details of the superceded SMUs, use the **show install superceded** command.

Task ID

Task ID	Operations
pkg-mgmt	read

The following example illustrates sample output from the **show install active** command :

```
sysadmin-vm:0_RP0# show install active
 Node 0/RP0 [RP]
    Boot Partition: calvados_lv0
    Active Packages: 2
       ncs6k-sysadmin-5.0.0.40I version=5.0.0.40I [Boot image]
       ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i

 Node 0/RP1 [RP]
    Boot Partition: calvados_lv0
    Active Packages: 2
       ncs6k-sysadmin-5.0.0.40I version=5.0.0.40I [Boot image]
       ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i

 Node 0/3 [LC]
    Boot Partition: calvados_lv0
    Active Packages: 2
       ncs6k-sysadmin-5.0.0.40I version=5.0.0.40I [Boot image]
       ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
```

Table 40: show install active Field Descriptions

Boot Partition	Location where the node stores the active software.
Boot Image	Location on the DSC of the active minimum boot image (MBI) used to boot the node.
Active Packages	Active packages loaded on the node.

Related Topics

install activate, on page 488
show install package, on page 515

show install committed

To display committed software packages, use the **show install committed** command in System Admin EXEC or XR EXEC mode.

System Admin EXEC Mode
show install committed

XR EXEC Mode
show install committed

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 5.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When a software package is activated, it remains active only until the next router reload. To save the active software to be persistent across router reloads, use the **install commit** command.

Use the **show install committed** command to display the packages included in the committed software set. This is useful for verifying that the desired set of packages is committed.

Task ID

Task ID	Operations
pkg-mgmt	read

The following shows sample output from the command. Enter the **show install committed** command without keywords or arguments to display detailed information for all nodes in the SDR or system:

```
RP/0/RP0/CPU0:router# show install committed
Wed Oct  1 08:12:09.520 UTC
Node 0/RP0/CPU0 [RP]
    Boot Partition: xr_lv0
    Committed Packages: 2
        ncs6k-xr-5.2.1.07I version=5.2.1.07I [Boot image]
        ncs6k-5.2.1.07I.CSCxr22222-1.0.0

Node 0/1/CPU0 [LC]
    Boot Partition: xr_lv0
    Committed Packages: 2
        ncs6k-xr-5.2.1.07I version=5.2.1.07I [Boot image]
        ncs6k-5.2.1.07I.CSCxr22222-1.0.0
```

Table 41: show install committed Field Descriptions

Field	Description
Boot Image	Image used to boot the node.
Committed Packages	Active packages committed on the node.

Related Topics

install activate, on page 488
show install active, on page 503
show install package, on page 515
install commit, on page 492

show install health

To validate the status of all relevant parameters and ensure the system is ready for an upgrade, use the **show install health** command in administration EXEC mode.

show install health

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show install health** command provides the ability to check the status of all parameters before an upgrade without interrupting the system.

Task ID

Task ID	Operation
pkg-mgmt	read

This example displays output from the **show install health** command:

```
RP/0/RP0/CPU0:router(admin)# show install health
sysadmin-vm:0_RP0# show install health
Platform is: xrv9k
Collecting Cards Information
Collecting Sysadmin VMs Information
Collecting XR VMs Information
Verifying all the required VMs are running.
Pass: All required VMs are Running
Collecting sysadmin VMs data
Collecting Host data
Collecting XR VMs data
Collecting Lead VMs data
Verifying Test Plugins
Verifying Plugins results
Verifying Result for:cal_version
Verifying Result for:cal_smus
Verifying Result for:cal_local_active_swp
Verifying Result for:cal_local_committed_swp
Verifying Result for:cal_disk_space
Verifying Result for:cal_marker_files
Verifying Result for:cal_mount_points
Verifying Result for:cal_stale_symlinks
Verifying Result for:cal_prepared_packages
```

```
Verifying Result for:cal_master_active_swp
Verifying Result for:cal_master_committed_swp
Verifying Result for:xr_master_active_swp
Verifying Result for:xr_master_committed_swp
Verifying Result for:xr_local_active_swp
Verifying Result for:xr_local_committed_swp
Verifying Result for:cal_image
Verifying Result for:host_version
Verifying Result for:host_smus
Verifying Result for:xr_version
Verifying Result for:xr_smus
Verifying Result for:xr_disk_space
Verifying Result for:xr_marker_files
Verifying Result for:xr_mount_points
Verifying Result for:xr_stale_symlinks
Verifying Result for:xr_prepared_packages
**********************************************************************
System is in Consistent State. You can go ahead with next operation.
**********************************************************************
Total time taken: 6.94424414635 seconds.
```

show install inactive

To display the inactive packages , use the **show install inactive** command in System Admin EXEC or XR EXEC mode.

show install inactive

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **show install inactive** command to display the inactive packages .

Note Use the **show install active** command to determine the device used as the boot device.

Task ID

Task ID	Operations
pkg-mgmt	read

The following example shows sample output from the **show install inactive** command:

```
sysadmin-vm:0_RP0# show install inactive

 Node 0/RP0 [RP]
    Inactive Packages:
       ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
 Node 0/RP1 [RP]
    Inactive Packages:
       ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
 Node 0/3 [LC]
    Inactive Packages:
       ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
```

Table 42: show install inactive Field Descriptions

Field	Description
Inactive Packages	Inactive packages present on the load.

Related Topics

install deactivate, on page 493
show install package, on page 515

show install issu inventory

To display the status of each node and the current status of ISSU, use the **show install issu inventory** command in administration EXEC mode.

show install issu inventory[{**detail** | **type** *ism-card-type*}]

Syntax Description

detail	Displays detailed information about the status of each card.
type *ism-card-type*	displays information regarding a specific card type. *ism-card-type* values can be of the following: **1**—Show inventory of all Active RPs in ndsc Racks **2**—Show inventory of all Standby RPs in ndsc Racks **3**—Show inventory of all Active DRPs (any rack) **4**—Show inventory of all Standby DRPs (any rack) **5**—Show inventory of the dSC node **6**—Show inventory of the Standby dSC node **7**—Show inventory of all Active Non-root SCs **8**—Show inventory of all Standby Non-root SCs **9**—Show inventory of the Root SC **10**—Show inventory of the Root SC backup **11**—Show inventory of all LCs (any rack) **12**—Show inventory of all Non-Fabric SPs. Eg:LC, Alarm, Fan Controller SPs **13**—Show inventory of all Fabric SPs

Command Default

Summary information is displayed

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show install issu inventory** command displays output only when the ISSU process is running.

Task ID

Task ID	Operation
pkg-mgmt	read

show install issu stage

To display the current stage of the running ISSU process, use the **show install issu stage** command in administration EXEC mode.

show install issu stage [**detail**]

Syntax Description

detail	Displays more information regarding the stage of the process.

Command Default

Displays summary information about the ISSU stage on the router.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show install issu stage** command displays output only when the ISSU process is running.

Task ID

Task ID	Operation
pkg-mgmt	read

This example displays output from the **show install issu stage** command during the load phase:

```
RP/0/RP0/CPU0:router(admin)# show install issu stage

Thu Dec 8 16:09:48.397 UTC
Current State : LOAD phase done (Load phase done)
Status : 31% Completed
Participating nodes : 0
Nodes in progress : 0
```

show install log

To display the details of installation requests, use the **show install log** command in System Admin EXEC or XR EXEC mode.

show install log [{*install-id*}]

Syntax Description

install-id	(Optional) Identifier assigned to an installation operation.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Enter the **show install log** command with no arguments to display a summary of all installation operations, including the changes to files and the processes impacted by each request. Specify the *install-id* argument to display details for a specific operation.

The *install-id* argument is listed beside each operation in the **show install log** summary and is attached to messages from that operation. For example, the third installation operation has “Install 3:” attached to all its status messages.

Task ID

Task ID	Operations
pkg-mgmt	read

This example shows how to display the summary of installation requests:

```
sysadmin-vm:0_RP0# show install log
Sep 17 07:33:12 Admin install operation 1 started by user 'root'
Sep 17 07:33:12 install add source
tftp://223.255.254.254/auto/tftp-infra/wmori/ng-install/images/40I/sysadmin-smu/
ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i.smu
Sep 17 07:33:38 Sending abort command to all nodes
Sep 17 07:33:38 Sending remove command to all nodes
Sep 17 07:33:41 Install operation 1 failed (Unable to connect to 223.255.254.254 server on
 node 0/RP1 where install service is running).
Sep 17 07:33:41 Ending 'install add' operation 1
Sep 17 07:39:59 Admin install operation 2 started by user 'root'
Sep 17 07:39:59 install add source
tftp://223.255.254.254/auto/tftp-infra/wmori/ng-install/images/40I/sysadmin-smu/
ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i.smu
Sep 17 07:40:25 Sending abort command to all nodes
Sep 17 07:40:25 Sending remove command to all nodes
Sep 17 07:40:26 Install operation 2 failed (Unable to connect to 223.255.254.254 server on
```

```
 node 0/RP1 where install service is running).
Sep 17 07:40:26 Ending 'install add' operation 2
Sep 18 05:06:23 Admin install operation 3 started by user 'root'
Sep 18 05:06:23 install add source
tftp://223.255.254.254/auto/tftp-infra/wmori/ng-install/images/40I/sysadmin-smu/
ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i.smu
Sep 18 05:06:30 Packages added:
Sep 18 05:06:30 ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
Sep 18 05:06:30 Install operation 3 completed successfully.
Sep 18 05:06:30 Ending 'install add' operation 3
Sep 18 05:18:44 Admin install operation 4 started by user 'root'
Sep 18 05:18:44 install prepare ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
Sep 18 05:18:45 Sending prepare command to all nodes
Sep 18 05:18:46 Install operation 4 completed successfully.
Sep 18 05:18:46 Ending 'install prepare' operation 4
```

This example shows how to display the output of show install log 7:

```
sysadmin-vm:0_RP0# show install log 4
Sep 18 05:18:44 Admin install operation 4 started by user 'root'
Sep 18 05:18:44 install prepare ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
Sep 18 05:18:45 Sending prepare command to all nodes
Sep 18 05:18:46 Install operation 4 completed successfully.
Sep 18 05:18:46 Ending 'install prepare' operation 4
```

Related Topics

install activate, on page 488
install add, on page 490
install deactivate, on page 493
install remove, on page 495
install commit, on page 492
install verify packages, on page 500

show install package

To display information about a package, use the **show install package** command in System Admin EXEC or XR EXEC mode.

show install package *package-name* [{**detail** | **verbose**}]

Syntax Description

package	Enter the package name.
detail	(Optional) Displays detailed information including impact to processes and nodes, vendor information, card support, and component information.
verbose	(Optional) Displays the information included in the keyword, plus information about dynamic link libraries (DLLs).

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **show install package** command with the **detail** keyword to display the version of the package, name of the manufacturer, name of the package, date and time when the package was built, and source directory where the package was built.

Use the **show install package** command with the **verbose** keyword to display the same information as the **detail** keyword, plus additional information about DLLs.

For additional information about the status of installed software packages, use the **show install active** and **show install inactive** commands.

Task ID

Task ID	Operations
pkg-mgmt	read

The following sample output from the **show install package** command lists all packages that are available on the router:

```
sysadmin-vm:0_RP0# show install package
package ncs6k-sysadmin-5.0.0.40I
  Filename          : ncs6k-sysadmin
           Version           : 5.0.0.40I
```

```
            ISO Type          : calvados
            RPM count         : 23

ISO Contents      :
    ncs6k-sysadmin-boot.all
    ncs6k-sysadmin-boot.lc
    ncs6k-sysadmin-boot.rp
    ncs6k-sysadmin-boot.sc
    ncs6k-sysadmin-fabric.all
    ncs6k-sysadmin-fabric.rp
    ncs6k-sysadmin-hostos.all
    ncs6k-sysadmin-hostos.rp
    ncs6k-sysadmin-mgbl.all
    ncs6k-sysadmin-mgbl.lc
    ncs6k-sysadmin-mgbl.rp
    ncs6k-sysadmin-mgbl.sc
    ncs6k-sysadmin-platform.all
    ncs6k-sysadmin-platform.lc
    ncs6k-sysadmin-platform.rp
    ncs6k-sysadmin-platform.sc
    ncs6k-sysadmin-shared.all
    ncs6k-sysadmin-shared.lc
    ncs6k-sysadmin-shared.rp
    ncs6k-sysadmin-system.all
    ncs6k-sysadmin-system.lc
    ncs6k-sysadmin-system.rp
    ncs6k-sysadmin-topo.all
```

Related Topics

show install active, on page 503
show install inactive, on page 509
show install log, on page 513
show install committed, on page 505

show install request

To display the list of incomplete installation requests, running and queued, use the **show install request** command in System Admin EXEC or XR EXEC mode.

show install request

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

The software processes only one installation request at a time. The **show install request** command displays any incomplete request that is currently running.

Note The default of installation commands is asynchronous mode, meaning that the command runs in the background and the EXEC prompt is returned as soon as possible.

Task ID

Task ID	Operations
pkg-mgmt	read

The following example shows sample output from the **show install request** command:

```
sysadmin-vm:0_RP0# show install request
Wed Sep  18 05:35:49.102 UTC
 User root, Op Id 8
 install activate
 ncs6k-sysadmin-5.0.0.40I.CSCui84128-0.0.9.i
```

The following example shows sample output from the **show install request** command when no installation operations are running:

```
sysadmin-vm:0_RP0# show install request
 No install operation in progress
```

Related Topics

install activate, on page 488

install add, on page 490
install deactivate, on page 493
install remove, on page 495
install verify packages, on page 500

show issu-warm-reload control-protocol trace

To display control protocol trace data about the ongoing process of an in-service software upgrade (ISSU), use the **show issu-warm-reload control-protocol trace** command in EXEC mode.

show issu-warm-reload control-protocol trace *data-type* **type**{**all** | **error** | **information** | **packet**} [**hexdump**] [**last** *n*] [**reverse**] [**stats**] [**tailf**] [**unique**][**verbose**] [**wrapping**][**file** *filename* **original**]

Syntax Description

data-type	The type of data to display. Valid options are: • **all**—Displays all trace data. • **chdlc**—Displays Cisco High-Level Data Link Control (cHDLC) Serial Line Address Resolution Protocol (SLARP) data. • **control-io**—Displays control input-output (I/O) data. • **ipv6nd**—Displays IPv6 ND data. • **lacp**—Displays Link Aggregation Control Protocol (LACP) data. • **platform**—Displays platform data. • **ppp**—Displays PPP data. all, chdlc, control-io, ipv6nd, lacp,
type	Specifies the format of trace data to display.
all	Displays error, information and packet traces.
error	Displays error traces.
information	Displays information traces.
packet	Displays packet traces.
hexdump	(Optional) Displays traces in hexadecimal format.
last *n*	(Optional) Displays the last *n* number of traces only.
reverse	(Optional) Displays the most recent traces first.
stats	(Optional) Displays execution path statistics.
tailf	(Optional) Displays new traces as they are added.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
verbose	(Optional) Displays additional internal debugging information.

wrapping	(Optional) Displays wrapping entries.
file *filename* **original**	(Optional) Specifies the filename of the file to display. You can specify up to four trace files.

Command Default

None.

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show issu-warm-reload control-protocol trace** command only provides information while the ISSU process is running. After the installation is complete, no information is provided.

Task ID

Task ID	Operation
system	read

show zapdisk locations

To display location information where zapdisk operation is supported, use the **show zapdisk locations** command in XR EXEC mode.

show zapdisk locations

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
diag	read

The following example shows sample output from the **show zapdisk locations** command:

```
RP/0/RP0/CPU0:router# show context

0/RSP1     Fully qualified location specification
0/7        Fully qualified location specification
0/4        Fully qualified location specification
all        all locations
```

zapdisk start location

To erase data from the disk memory of RSPs and line cards, use the **zapdisk start location** command in XR EXEC mode.

zapdisk start location *node-id*

Syntax Description

location { *node-id* | **all**}	Specify the location string obtained from the **show zapdisk location** command. Zapdisk can be executed for specific node location or all node locations.

Command Default

Disabled.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

After the command is executed, the card is shut down. Do not reload the card.

Caution This command should not be used during normal operation of the router. The command should be used only when you have planned to delete the data from the card during return material authorization (RMA).

Task ID

Task ID	Operations
diag	read, write

The following example shows how to erase data from the line card location 0/4:

```
Router# zapdisk start location 0/4
Action on designated location is in progress, more detail logs will be located in sysadmin
 at
/misc/disk1/tftpboot/zapdisk.log once action is completed
```

zapdisk set

To enable the zapdisk feature, use the **zapdisk set** command in the System Admin EXEC mode.

Note When the zapdisk feature is enabled on a CPU board, the following events will not trigger zapdisk functions:

- Reload the board using CLI.
- Perform a physical Online Insertion and Removal (OIR) on the board.
- Reload the router.

zapdisk set

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
root-system	execute

The following example shows how to use the **zapdisk set** command:

```
sysadmin-vm:0_RP0# zapdisk set
Fri Jul  21 22:32:29.242 UTC
result Zapdisk set command success
```

zapdisk unset

To disable zapdisk feature, use the **zapdisk unset** command in the System Admin EXEC mode.

zapdisk unset

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes System Admin EXEC

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
root-system	execute

The following example shows how to disable zapdisk feature on all CPU boards on the router:

```
sysadmin-vm:0_RP0# zapdisk unset
Fri Jul  21 22:32:29.242 UTC
result Zapdisk unset command success
```

Terminal Services Commands

This chapter describes the Cisco IOS XR commands used for setting up physical and virtual terminal connections, managing terminals, and configuring virtual terminal line (vty) pools. It also includes commands for the managing the Craft Panel Interface.

For detailed information about configuring physical and virtual terminals, see the *Implementing Physical and Virtual Terminals on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

More information on the Craft Panel Interface is also available in the NCS System Set-up guide.

- absolute-timeout, on page 527
- access-class, on page 528
- autocommand, on page 530
- banner exec, on page 532
- banner incoming, on page 534
- banner login, on page 536
- banner motd, on page 538
- banner prompt-timeout, on page 540
- clear line, on page 542
- clear line vty, on page 543
- disconnect, on page 544
- disconnect-character, on page 545
- escape-character, on page 546
- exec-timeout, on page 548
- flowcontrol hardware, on page 550
- lcd alarm-category, on page 551
- lcd message , on page 552
- lcd name, on page 553
- length, on page 554
- line, on page 555
- parity, on page 556
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- send, on page 559
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- show cli submode-exit, on page 563

- show diag lcd-interface, on page 564
- show line, on page 565
- show sessions, on page 568
- show terminal, on page 570
- show users, on page 572
- stopbits, on page 574
- terminal cli submode-exit, on page 575
- terminal exec prompt, on page 576
- terminal exec utility pager, on page 577
- terminal length, on page 578
- terminal width, on page 580
- timestamp disable, on page 581
- transport input, on page 582
- transport output, on page 584
- transport preferred, on page 586
- vty-pool, on page 588
- width (display), on page 590

absolute-timeout

To set the absolute timeout for line disconnection, use the **absolute-timeout** command in line template configuration mode. To remove the **absolute-timeout** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

absolute-timeout *minutes*
no absolute-timeout *minutes*

Syntax Description

minutes	Absolute timeout interval, in minutes. Range is from 10 to 10000.

Command Default

minutes: 1440

Command Modes

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **absolute-timeout** command to terminate the connection after the specified time has elapsed, regardless of whether the connection is being used at the time of termination. You can specify an absolute-timeout value for each port. The user is notified 20 seconds before the session is terminated.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the session timeout value to 2880 minutes (2 days) for the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# absolute-timeout 2880
```

Related Commands

Command	Description
banner incoming, on page 534	Sets the idle wait timeout interval for user input over a physical terminal connection.
session-timeout, on page 562	Sets the idle wait timeout interval for user input over a virtual terminal connection.

access-class

To restrict incoming and outgoing connections using an IPv4 or IPv6 access list, use the **access-class** command in line template configuration mode. To remove the restriction, use the **no** form of this command.

access-class *list-name* {**in** | **out**}
no accessclass *list-name* {**in** | **out**}

Syntax Description

list-name	IPv4 or IPv6 access list name.
in	Filters incoming connections.
out	Filters outgoing connections.

Command Default

No access class is set.

Command Modes

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **access-class** command to restrict incoming or outgoing connections to addresses defined in an access list. Use the **ipv4 access-list** or **ipv6 access-list** command to define an access list by name.

Note To restrict access of incoming or outgoing connections over IPv4 and IPv6, the IPv4 access list and IPv6 access list must share the same name.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to specify an access class assigned to outgoing connections for the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# access-class vtyacl out
```

The following sample output from the **show ipv4 access-lists** command displays the IPv4 access list named vtyacl:

```
RP/0/RP0/CPU0:router# show ipv4 access-lists vtyacl

ipv4 access-list vtyacl
 10 permit ip host 10.32.162.48 any
 20 permit ip host 10.20.49.170 any
 30 permit ip host 10.60.3.5 any
```

The following sample output from the **show ipv6 access-lists** command displays the IPv6 access list name vtyacl:

```
RP/0/RP0/CPU0:router# show ipv6 access-lists vtyacl

ipv6 access-list vtyacl
 10 permit ipv6 host 2001:db8:2222:: any
 20 permit ipv6 host 2001:db8:0:4::2 any
```

Related Commands

Command	Description
ipv4 access-list	Defines an IPv4 access list by name.
ipv6 access-list	Defines an IPv6 access list by name.

autocommand

To automatically run one or more commands after a user logs in to a vty terminal session, use the **autocommand** command in line default or line template configuration mode. To remove the **autocommand** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

autocommand *command*
no autocommand *command*

Syntax Description

command	Command or command alias to be executed on user login to a vty session.

Command Default

No default behavior or values

Command Modes

Line template configuration

Line default configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **autocommand** command to automatically run a command or command alias when a user logs in to a vty session. To run multiple commands, use a command alias for the *command* argument. When the user logs in, the commands included in the alias are run sequentially.

Note The **autocommand** command is supported on vty connections only; it is not supported on console or aux line connections. Use this command to automatically run a command after user login.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to use the **autocommand** command to automatically run the **show ip interface brief** command when a user logs in to a default vty session:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# autocommand show ip interface brief
RP/0/RP0/CPU0:router(config-line)# end
```

```
Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes

RP/0/RP0/CPU0:router# exit

  <Your 'TELNET' connection has terminated>
```

The following example shows how to disable the feature using the **no** form of the **autocommand** command. In this example, the autocommand for the **show ip interface brief** command is disabled. When the user logs out, and logs back in, the **autocommand** command does not run.

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# no autocommand ?

  LINE  Appropriate EXEC command

RP/0/RP0/CPU0:router(config-line)# no autocommand show ip interface brief
RP/0/RP0/CPU0:router(config-line)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes

RP/0/RP0/CPU0:router# exit

<Your 'TELNET' connection has terminated>

User Access Verification

Username: lab
Password:
RP/0/RP0/CPU0:router#
```

banner exec

To create a message that is displayed when an EXEC process is created (an EXEC banner), use the **banner exec** command in XR Config mode.To delete the EXEC banner, use the **no** form of this command.

banner exec *delimiter message delimiter*
no banner exec

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. Text may include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 43: banner exec Tokens, on page 532.

Command Default

No EXEC banner is displayed.

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **banner exec** command to specify a message that is displayed when an EXEC process is created (a line is activated or an incoming connection is made to a vty). Follow this command with one or more blank spaces and the delimiting character (c). After entering one or more lines of text, terminate the message with the delimiting character (c).

When a user connects to a router, the message-of-the-day (MOTD) banner appears first, followed by the login banner and prompts. After the user logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

Use tokens in the form $(*token*) in the message text to customize the banner. Tokens display current configuration variables, such as the router hostname and IP address.

The tokens are described in this table.

Table 43: banner exec Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.

Token	Information Displayed in the Banner
$(line)	Displays the vty or tty (asynchronous) line number.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set an EXEC banner that uses tokens:

```
RP/0/RP0/CPU0:router(config)# banner exec c

  Enter TEXT message.  End with the character 'c'.

THIS IS AN EXEC BANNER
c
```

Related Commands

Command	Description
banner incoming, on page 534	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner login, on page 536	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 538	Defines a customized MOTD banner.
banner prompt-timeout, on page 540	Defines a customized banner that is displayed when there is a login timeout.

banner incoming

To create a banner that is displayed when there is an incoming connection to a terminal line from a host on the network, use the **banner incoming** command in XR Config mode. To delete the incoming connection banner, use the **no** form of this command.

banner incoming *delimiter message delimiter*
no banner incoming

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 44: banner incoming Tokens, on page 535.

Command Default

No incoming banner is displayed.

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow the **banner incoming** command with one or more blank spaces and the delimiting character (c). After entering one or more lines of text, terminate the message with the second occurrence of the delimiting character (c).

An *incoming connection* is one initiated from the network side of the router. Incoming connections are also called reverse Telnet sessions. These sessions can display message-of-the-day (MOTD) banners and incoming banners, but they do not display EXEC banners.

When a user connects to a router, the MOTD banner (if configured) appears first, followed by the login banner and prompts. After the user logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

Incoming banners cannot be suppressed. If you do not want the incoming banner to appear, you must delete it with the **no banner incoming** command.

To customize the banner, use tokens in the form $(*token*) in the message text. Tokens display current variables, such as the router hostname and IP address.

This table describes the tokens.

Table 44: banner incoming Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.
$(line)	Displays the vty or tty (asynchronous) line number.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to create an incoming connection banner:

```
RP/0/RP0/CPU0:router(config)# banner incoming c

  Enter TEXT message. End with the character 'c'
THIS IS AN INCOMING BANNER.
c
```

Related Commands

Command	Description
banner exec, on page 532	Defines a customized banner that is displayed whenever the EXEC process is initiated.
banner login, on page 536	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 538	Defines a customized MOTD banner.
banner prompt-timeout, on page 540	Defines a customized banner that is displayed when there is a login timeout.

banner login

To create a customized banner that is displayed before the username and password login prompts, use the **banner login** command in XR Config mode. To disable the login banner, use **no** form of this command.

banner login *delimiter message delimiter*
no banner login

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 45: banner login Tokens, on page 536.

Command Default

No login banner is displayed.

Command Modes

XR Config mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow the **banner login** command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

When a user connects to the router, the message-of-the-day (MOTD) banner (if configured) appears first, followed by the login banner and prompts. After the user successfully logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

To customize the banner, use tokens in the form $(*token*) in the message text. Tokens display current configuration variables, such as the router hostname and IP address.

Tokens are described in the this table.

Table 45: banner login Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.
$(line)	Displays the vty or tty (asynchronous) line number.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set a login banner:

```
RP/0/RP0/CPU0:router(config)# banner login c

Enter TEXT message. End with the character 'c'.
THIS IS A LOGIN BANNER
c
```

Related Commands

Command	Description
banner exec, on page 532	Defines a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 534	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner motd, on page 538	Defines a customized MOTD banner.
banner prompt-timeout, on page 540	Defines a customized banner that is displayed when there is a login timeout.

banner motd

To create a message-of-the-day (MOTD) banner, use the **banner motd** command in XR Config mode. To delete the MOTD banner, use the **no** form of this command.

banner motd *delimiter message delimiter*
no banner motd

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable.

Command Default

No MOTD banner is displayed.

Command Modes

XR Config mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow this command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

This MOTD banner is displayed to all terminals connected and is useful for sending messages that affect all users (such as impending system shutdowns). Use the **no banner motd** command to disable the MOTD banner on a line.

When a user connects to the router, the MOTD banner (if configured) appears first, followed by the login banner and prompts. After the user successfully logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

To customize the banner, use tokens in the form $(token) in the message text. Tokens display current configuration variables, such as the router hostname and IP address.

Tokens are described in this table.

Table 46: banner motd Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.

Token	Information Displayed in the Banner
$(line)	Displays the vty or tty (asynchronous) line number.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to configure an MOTD banner with a token:

```
RP/0/RP0/CPU0:router(config)# banner motd c

  Enter TEXT message.  End with the character 'c'.
Notice: all routers in $(domain) will be upgraded beginning April 20
c
```

Related Commands

Command	Description
banner exec, on page 532	Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 534	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner login, on page 536	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner prompt-timeout, on page 540	Defines a customized banner that is displayed when there is a login timeout.

banner prompt-timeout

To create a banner that is displayed when there is a login authentication timeout, use the **banner prompt-timeout** command in XR Config mode. To delete the prompt timeout banner, use the **no** form of this command.

banner prompt-timeout *delimiter message delimiter*
no banner prompt-timeout

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable.

Command Default

No banner is displayed when there is a login authentication timeout.

Command Modes

XR Config mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow this command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

This prompt-timeout banner is displayed when there is a login authentication timeout at the username and password prompt.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to configure a prompt-timeout banner:

```
RP/0/RP0/CPU0:router(config)# banner prompt-timeout c

Enter TEXT message.  End with the character 'c'.
THIS IS A PROMPT TIMEOUT BANNER
c
```

Related Commands

Command	Description
banner exec, on page 532	Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 534	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner login, on page 536	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 538	Defines a customized MOTD banner.

clear line

To clear an auxiliary or console line to an idle state, use the **clear line** command in XR EXEC mode.

clear line {**aux** | **console**} **location** *node-id*

Syntax Description

aux	Clears the auxiliary line.
console	Clears the console line.
location *node-id*	Specifies the location of a route processor (RP) where the auxiliary or console line to be cleared resides. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
tty-access	execute

The following example shows how to clear the console line, putting it in an idle state:

```
RP/0/RP0/CPU0:router# clear line console location 0/RP1/CPU0
```

Related Commands

Command	Description
show users, on page 572	Displays information about the active lines on the networking device.

clear line vty

To clear a virtual terminal line (vty) to an idle state, use the **clear line vty** command in XR EXEC mode.

clear line vty *line-number*

Syntax Description

line-number	Line number in the range from 0 to 99.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show users** command to determine the origin of the connection and which lines to clear. When a line is cleared to an idle state, the user on the other end of the connection receives notice that the connection was closed by a foreign host.

Task ID

Task ID	Operations
tty-access	execute

The following example shows how to reset vty 3 to the idle state:

```
RP/0/RP0/CPU0:router# clear line vty 3
```

Related Commands

Command	Description
show users, on page 572	Displays information about the active lines on the networking device.

disconnect

To disconnect a network connection, use the **disconnect** command in XR EXEC mode.

disconnect [{*connection-numbernetwork-name*}]

Syntax Description

connection-number	(Optional) Number of the line of the active network connection to be disconnected. Range is from 1 to 20.
network-name	(Optional) Name of the active network connection to be disconnected.

Command Modes

XR EXEC mode

Command Default

Disconnects the existing network connection if no arguments are provided.

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

Do not disconnect a line to end a session. Instead, log off the host before ending the session to clear the connection. If you cannot log out of an active session, disconnect the line.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to disconnect from a device (in this example “User1”) to return to the router:

```
User1% disconnect
 Connection closed by remote host

RP/0/RP0/CPU0:router#
```

disconnect-character

To define a character to disconnect a session, use the **disconnect-character** command in line template configuration mode. To remove the **disconnect-character** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

disconnect-character [{*numbercharacter*}]
no disconnect-character

Syntax Description

number	(Optional) ASCII decimal equivalent of the disconnect character. Range is from 0 through 255.
character	(Optional) Disconnect character.

Command Default

No disconnect character is defined.

Command Modes

Line template configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The break character is represented by 0; null cannot be represented.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the disconnect character for the default line template to the Esc character, which is the ASCII decimal equivalent 27:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# disconnect-character 27
```

Related Commands

Command	Description
escape-character, on page 546	Defines an escape character.

escape-character

To define a character to escape a session, use the **escape-character** command in line template configuration mode. To remove the **escape-character** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

escape-character {**break***numbercharacter* | **default** | **none**}
no escape-character

Syntax Description

break	Sets the escape character to the Break key.
number	ASCII decimal equivalent of the escape character. Range is from 0 through 255.
character	Escape character.
default	Specifies the default escape character (^^X).
none	Disables the escape function.

Command Default

The default escape character is ^^X.

Command Modes

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **escape-character** command to define an escape character sequence that is different from the default. Use the escape character to exit from an existing connection and return to the EXEC prompt.

The default escape key sequence is Ctrl-Shift-6, X (^^X).The **escape-character** command with the **default** keyword sets the escape character to the Break key (the default setting for the Break key is Ctrl-C).

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the escape character for the default line template to Ctrl-P, which is the ASCII decimal character 16:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# escape-character 16
```

Related Commands

Command	Description
disconnect-character, on page 545	Defines a disconnect character.

exec-timeout

To set the interval that the EXEC command interpreter waits until user input is detected, use the **exec-timeout** command in the appropriate line configuration mode. To remove the **exec-timeout** command from the running configuration and restore the system to its default condition, use the **no** form of this command.

exec-timeout *minutes seconds*
no exec-timeout *minutes seconds*

Syntax Description

minutes	Minutes for the wait interval. Range is from 0 to 35791.
seconds	Seconds for the wait interval. Range is from 0 to 2147483.

Command Default

minutes: 10

seconds: 0

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If no input is detected during the interval, the EXEC facility resumes the current connection. If no connections exist, the EXEC facility returns the terminal to the idle state and disconnects the incoming session. To disable the EXEC timeout function so that the EXEC session never timeouts, enter the following command:

```
exec-timeout 00
```

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the timeout interval for the console line template to 60 minutes, 0 seconds:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# exec-timeout 60 0
```

Related Commands

Command	Description
absolute-timeout, on page 527	Sets the absolute timeout for line disconnection.
session-timeout, on page 562	Sets the idle wait timeout interval for user input over a virtual terminal connection.

flowcontrol hardware

To configure the hardware flow control setting for physical terminal connections, use the **flowcontrol hardware** command in line console configuration mode. To remove the attribute from the configuration file and restore the system to its default condition, use the **no** form of this command.

flowcontrol hardware {**in** | **out** | **none**}
no flowcontrol hardware {**in** | **out** | **none**}

Syntax Description

in	Specifies inbound flow control.
out	Specifies outbound flow control.
none	Specifies no flow control.

Command Default

None

Command Modes

Line console configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **flowcontrol hardware** command to set the flow control attribute for physical line connections. Physical line connections use either the console or auxiliary line template.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to restrict the hardware flow control to inbound for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# flowcontrol hardware in
```

Related Commands

Command	Description
show users, on page 572	Displays information about the active lines on the networking device.

lcd alarm-category

To set the alarm-category (will get displayed on the LCD panel), use the **lcd alarm-category** command in the appropriate mode. To delete the set category, use the **no** form of the command.

lcd alarm-category *number*
no lcd alarm-category *number*

Syntax Description

number	Number to identify the alarm category. This lists indicates the numbers for classification: • 1 for critical • 2 for critical and major • 3 for critical, major and minor • 0 for other

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd alarm-category** command:

```
RP/0/RP0/CPU0:router (config) # lcd alarm-category 2
```

lcd message

To set administrative messages (will get displayed on the LCD panel), use the **lcd message** command in the appropriate mode. To delete the set message, use the **no** form of the command.

lcd message *message*

Syntax Description

message	Administrative message for the operator. Limit is 512 alphanumeric characters.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd message** command:

```
RP/0/RP0/CPU0:router (config) # lcd message abcd
```

lcd name

To set the rack-name (will get displayed on the LCD panel), use the **lcd name** command in the appropriate mode. To delete the set name, use the **no** form of the command.

lcd name *rack-name location*

Syntax Description

rack-name	The rack-name. Limit is 15 alphanumeric characters.
location	The location of the rack (rack-id).

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd name** command:

```
RP/0/RP0/CPU0:router (config) # lcd name lc1
```

length

To set the number of lines that display at one time on the screen, use the **length** command in line template configuration mode. To remove the **length** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

length *lines*
no length *lines*

Syntax Description

lines	Number of lines that displays on a screen. Range is from 0 through 512. 0 specifies no pausing. The default is 24.

Command Default

lines : 24

Command Modes

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **length** command to modify the default length setting for the specified line template. The length setting determines when the screen pauses during the display of multiple-screen output. Specifying a value of 0 for the lines argument prevents the router from pausing between screens of output.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the length of the default line template to 33 lines:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# length 33
```

Related Commands

Command	Description
terminal length, on page 578	Sets the length of the display terminal for the current terminal session.

line

To specify the console, the default, or a user-defined line template and enter line template configuration mode, use the **line** command in

XR Config

mode.

line {**console** | **default** | **template** *template-name*}

Syntax Description

console	Specifies the line template for the console line.
default	Specifies the default line template.
template *template-name*	Specifies a user-defined line template to be applied to a vty pool.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **line** command to specify a line template type and enter into line template configuration mode. Line templates are a collection of attributes used to configure and manage physical terminal line connections (the console and auxiliary ports) and vty connections. The following templates are available in Cisco IOS XR software:

- Default line template—The default line template that applies to a physical and virtual terminal lines.
- Console line template—The line template that applies to the console line.
- User-defined line templates—User-defined line templates that can be applied to a range of virtual terminal lines.

The following example shows how to enter line template configuration mode to allow configuration changes to be made to the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)#
```

parity

To set the parity bit for physical terminal connections, use the **parity** command in line console configuration mode. To specify no parity, use the **no** form of this command.

parity {**even** | **none** | **odd**}
no parity {**even** | **none** | **odd**}

Syntax Description

even	Specifies even parity.
none	Specifies no parity.
odd	Specifies odd parity.

Command Default

No parity is set.

Command Modes

Line console configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Communication protocols provided by devices such as terminals and modems often require a specific parity bit setting.

Use the **parity**command for setting the parity attribute for physical terminal connections. Physical terminal connections use either the console or auxiliary line template.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the line parity configuration to even for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# parity even
```

Related Commands

Command	Description
show users, on page 572	Displays information about the active lines on the networking device.

resume

To switch to another active Secure Shell (SSH) or Telnet session, use the **resume** command in

XR EXEC

mode.

resume [*connection*]

Syntax Description

connection	(Optional) Name or number of the active network connection; the default is the most recent connection. Number range is from 1 to 20.

Command Default

The most recent connection.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SSH and Telnet sessions can be established to another router or server.

When the network session is being established and without disconnecting the network session, you can resume the router console session by typing a special sequence of characters as shown. After switching back to the router console, the network connection can be resumed by specifying the number of the connection or the name of the connection.

You can have several concurrent sessions open and switch back and forth between them. The number of sessions that can be open is defined using the **session-limit** command.

You can switch between sessions by escaping one session and resuming a previously opened session, as follows:

1. Escape from the current session by pressing the escape sequence (Ctrl Shift-6, x [^^X]) to return to the EXEC prompt.
2. Enter the **show sessions** command to list the open sessions. All open sessions associated with the current terminal line are displayed.
3. Enter the **resume** command and the session number to make the connection.

   You can also resume the previous session by pressing the **Return** key.

   The **^^X** and commands are available for all supported connection protocols.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to escape from one connection and resume another. You can omit the connection name and simply enter the connection number to resume that connection.

```
host1% ^^X
RP/0/RP0/CPU0:router# resume 1

blg_router#
```

Related Commands

Command	Description
session-limit, on page 561	Sets the maximum number of outgoing terminal sessions from the current terminal.
show sessions, on page 568	Displays information about SSH and Telnet connections.
telnet	Logs in to a host that supports Telnet.

send

To send messages to one or all terminal lines, use the **send** command in

XR EXEC

mode.

send {***line-number** | **aux 0** | **console 0** | **vty** *number*}

Syntax Description

*****	Sends a message to all tty lines.
line-number	Line number to which the message is sent. A number from 0 to 101.
aux 0	Sends a message to the auxiliary line.
console 0	Sends a message to the console line.
vty *number*	Sends a message to a virtual terminal line (vty). Range is 0 to 99.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The system prompts for the message, which can be up to 500 characters long. Enter **Ctrl-Z** to end the message. Enter **Ctrl-C** to abort this command.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to send a message to all lines:

```
RP/0/RP0/CPU0:router# send *

Enter message, end with CTRL/Z; abort with CTRL/C:
The system will be shut down in 10 minutes for repairs.^Z
Send message? [confirm]
RP/0/RP0/CPU0:router#
```

```
***
***
*** Message from tty to all terminals:
***
The system will be shut down in 10 minutes for repairs.
```

session-limit

To set the maximum number of outgoing terminal sessions from the current terminal, use the **session-limit** command in the appropriate line configuration mode. To remove any specified session limit, use the **no** form of this command.

session-limit *connections*
no session-limit

Syntax Description

connections	Maximum number of outgoing connections. Range is from 0 through 20.

Command Default

connections : 6

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to limit the number of active outgoing connections for the default line template to eight:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# session-limit 8
```

session-timeout

To set the timeout interval for all outgoing connections from the current terminal, use the **session-timeout** command in the appropriate line configuration mode. To remove the **session-timeout** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

session-timeout *minutes* [**output**]
no session-timeout *minutes*

Syntax Description

minutes	Timeout interval, in minutes. Range is 0 to 35791. The default is 10.
output	(Optional) Specifies that when traffic is sent to an asynchronous line from the router (within the specified interval), the connection is retained.

Command Default

minutes : 10

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **session-timeout** command to set the interval that Cisco IOS XR software waits for traffic before closing the connection to a remote device and returning the terminal to an idle state. If the **output** keyword is not specified, the session timeout interval is based solely on detected input from the user. If the keyword is specified, the interval is based on input and output traffic.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the session timeout value for the default line template to 120 minutes (2 hours):

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# session-timeout 120
```

show cli submode-exit

To display the status of terminal submode-exit configuration, use **show cli submode-exit status** command in XR EXEC mode.

show cli submode-exit status

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

XR EXEC mode.

Command History

Release	Modification
Release 6.5.1	This command was introduced.

Usage Guidelines

You cannot enable or disable service cli submode-exit on a different users's VTY session..

```
RP/0/RP0/CPU0:router #show cli submode-exit status
Global  submode exit feature is enabled.
Session submode exit feature is enabled
```

show diag lcd-interface

To display details about the LCD interface (of the craft panel) , use the **show diag lcd-interface** command in the appropriate mode.

show diag lcd-interface

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
lcd	read

Example

This example shows how to use the **show diag lcd-interface**

```
RP/0/RP0/CPU0:router # show diag location 0/CI0

Diag Information For : 0/CI0

 0/CI0-IDPROM Info
    Controller Family        : 0084
    Controller Type          : 0932
    PID                      : NCS4K-CRAFT
    Version Identifier       : V00
    UDI Description          : NCS 4000 Craft Panel
    CLEI Code                : NOCLEICODE
    ECI Number               : 11223344
    Top Assy. Part Number    : 800-41609-01
    Top Assy. Revision       : 12
    PCB Serial Number        : SAL1818RL2G
    PCA Number               : 73-14799-03
```

show line

To display the parameters of terminal lines, use the **show line** command in

XR EXEC

mode.

show line [{**aux location** *node-id* | **console location** *node-id* | **vty** *number*}]

Syntax Description

aux	(Optional) Displays the terminal line parameters for the auxiliary line.
location *node-id*	(Optional) Specifies the location for the route processor (RP) on which the auxiliary or console port resides. The *node-id* argument is entered in the *rack/slot* notation.
console	(Optional) Displays the terminal line parameters for the console line.
vty *number*	(Optional) Specifies a virtual terminal line (vty) number. Range is from 0 through 99.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
tty-access	read

The following example shows sample output from the **show line** command. The asterisk (*) indicates the current terminal session.

```
RP/0/RP0/CPU0:router# show line

    Tty             Speed     Modem  Uses   Noise Overruns           Acc I/O
    aux0_0_0         9600       -     -       -      0/0              -/-
*   con0_0_0         9600       -     -       -      0/0              -/-
    vty0             0/0        -     -       -      0/0              -/-
```

```
    vty1            0/0         -     -       -      0/0              -/-
    vty2            0/0         -     -       -      0/0              -/-
    vty3            0/0         -     -       -      0/0              -/-
    vty4            0/0         -     -       -      0/0              -/-
    vty100          0/0         -     -       -      0/0              -/-
    vty101          0/0         -     -       -      0/0              -/-
    vty102          0/0         -     -       -      0/0              -/-
    vty103          0/0         -     -       -      0/0              -/-
    vty104          0/0         -     -       -      0/0              -/-
    vty105          0/0         -     -       -      0/0              -/-
```

Table 47: show line Field Descriptions

Field	Description
Tty	Available ttys and vtys.
Speed	Baud rate that the inbound serial connection is using, in bps.
Modem	Not implemented.
Uses	Not implemented.
Noise	Not implemented.
Overruns	Hardware Universal Asynchronous Receiver/Transmitter (UART) overruns or software buffer overflows, both defined as the number of overruns or overflows that have occurred on the specified line since the system was restarted. Hardware overruns are buffer overruns; the UART chip has received bits from the software faster than it can process them. A software overflow occurs when the software has received bits from the hardware faster than it can process them.
Acc I/O	Not implemented.

The following example shows sample output from the **show line** command with the console line specified:

```
RP/0/RP0/CPU0:router# show line console location 0/rp0/cpu0

    Tty             Speed     Overruns             Acc I/O
    con0/RP0/CPU0    9600          0/0                 -/-

  Line con0_RP0_CPU0, Location "0/RP0/CPU0", Type "Console"
  Length: 24 lines, Width: 80 columns
  Baud rate (TX/RX) is 9600, 1 parity, 2 stopbits, 8 databits
  Template: console
  Capabilities: Timestamp Disabled
  Allowed transports are none.
```

Table 48: show line location Field Descriptions

Field	Description
Tty	Unique identifier of the tty; it contains the type of tty and, for physical ttys, it indicates the physical location of the tty.
Speed	Baud rate that the inbound serial connection is using in bps.

Field	Description
Overruns	Hardware UART overruns or software buffer overflows, both defined as the number of overruns or overflows that have occurred on the specified line since the system was restarted. Hardware overruns are buffer overruns; the UART chip has received bits from the software faster than it can process them. A software overflow occurs when the software has received bits from the hardware faster than it can process them.
Acc I/O	Not implemented.
Line	Unique identifier of the TTY. This field displays the type of TTY and the physical location of physical TTYs.
Location	Location of the line.
Type	Line type.
Length	Length of the terminal or screen display, in rows.
Width	Width of the terminal or screen display, in columns.
Baud rate (TX/RX)	Transmit rate/receive rate of the line, in bps.
parity	Parity bits value used for physical terminal connections.
stopbits	Stop bits value used for physical terminal connections.
databits	Data bits value used for physical terminal connections.
Template	Line template being sourced by the particular connection.
Config	Configuration applied to the tty. This field indicates the allowed incoming transports that can be used to access the router from this tty.
Allowed transports are	Incoming transport protocols that can be used by this tty to access the router.

show sessions

To display information about suspended Secure Shell (SSH) and Telnet connections launched from the terminal session, use the **show sessions** command in

XR EXEC

mode.

show sessions

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show sessions** command to display the hostname, remote connection service used by the router to access the host, idle time, and connection name.

Task ID

Task ID	Operations
tty-access	read

The following example shows sample output from the **show sessions** command:

```
RP/0/RP0/CPU0:router# show sessions

  Conn Host               Address            Service Idle Conn Name
  *  1 10.26.25.40        10.26.25.40        telnet    15 10.26.25.40
```

The asterisk (*) indicates the current terminal session.

Table 49: show sessions Field Descriptions

Field	Description
Conn	Identifier for the connection used for resuming and disconnecting suspended sessions. An asterisk (*) indicates the current terminal session.

Field	Description
Host	Remote host to which the router is connected. This field displays either the IP address or hostname of the remote host. If the IP address of the remote host is mapped to the hostname (that is, if Domain Name System [DNS] services are enabled) and the session is initiated with the hostname, the output for this field displays the hostname of the host rather than the IP address of the host.
Address	IP address of the remote host.
Service	Remote connection service used.
Idle	Interval (in seconds) since data was last sent on the line.
Conn Name	Equivalent to the “Host” field in Cisco IOS XR software.

Related Commands

Command	Description
disconnect, on page 544	Disconnects a network connection.
resume, on page 557	Switches to another active Telnet session.

show terminal

To obtain information about the terminal configuration attribute settings for the current terminal line, use the **show terminal** command in

XR EXEC

mode.

show terminal

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

None.

This example shows sample output from the **show terminal** command:

```
RP/0/RP0/CPU0:router# show terminal

Line vty0, Location "10.56.249.67", Type "VTY"
Length: 24 lines, Width: 80 columns
Baud rate (TX/RX) is 0, 0 parity, 0 stopbits, 0 databits
Template: default
Capabilities: Timestamp Disabled
Allowed transports are telnet ssh.
```

Table 50: show terminal Field Descriptions

Field	Description
Line	Line that is currently being used.
Location	Location of the terminal accessing the router.
Type	Type of line.
Length	Length of the terminal or screen display, in rows.
Width	Width of the terminal or screen display, in columns.
Baud rate (TX/RX)	Transmit or receive rate of the line, in bps.

Field	Description
parity	Parity bits value used for physical terminal connections.
stopbits	Stop bits value used for physical terminal connections.
databits	Data bits value used for physical terminal connections.
Template	Line template being sourced by the particular connection.
Config	Configuration applied to the tty. This field indicates the allowed incoming transports that can be used to access the router from this tty.
Allowed transports are	Incoming transport protocols that can be used by this tty to access the router.

show users

To display information about the active lines on the router, use the **show users** command in System Admin EXEC or XR EXEC mode.

show users

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show users** command to display the line number, connection name, idle time, hosts, and terminal location. An asterisk (*) indicates the current terminal session.

Note To display all user groups and task IDs associated with the currently logged-in user, use the **show user** command in EXEC mode. See the *Authentication, Authorization, and Accounting Commands on Cisco IOS XR Software* module in *System Security Command Reference for Cisco NCS 6000 Series Routers*.

Task ID

Task ID	Operations
tty-access	read

The following example shows sample output identifying an active vty terminal session:

```
RP/0/RP0/CPU0:router# show users

    Line            User                Service  Conns   Idle        Location
    con0_RP0_CPU0   cisco               hardware     0  18:33:48
    vty0            cisco               telnet       0  00:30:36    10.33.54.132
  * vty1            cisco               telnet       0  00:00:00    10.33.54.132
```

Table 51: show users Command Output Field Descriptions

Field	Description
Line	All current connections. An asterisk (*) indicates the active connection.
User	Username of the user logged into the line.
Service	Physical or remote login service used.
Conns	Number of outgoing connections.
Idle	Interval (in hours:minutes:seconds) since last keystroke.
Location	IP address of remote login host. For local (physical) terminal connections, this field is blank.

Related Commands

Command	Description
show line, on page 565	Displays the parameters of a terminal line.
show user	Displays all user groups and task IDs associated with the currently logged-in user.

stopbits

To set the stop bits used for physical terminal connections, use the **stopbits** command in line console configuration mode. To restore the default, use the **no** form of this command.

stopbits {**1** | **2**}
no stopbits

Syntax Description

1	Specifies one stop bit.
2	Specifies two stop bits. This is the default.

Command Default

Two stop bits.

Command Modes

Line console configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **stopbits** command to set the data bits attributes for physical terminal connections. Physical terminal connections use either the console or auxiliary terminal templates.

Communication protocols provided by devices such as terminals and modems often require a specific stop-bit setting.

Note The number of stop bits configured on the router and a terminal server should be same. The default number of stop bits on the router is two stop-bits.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to change the default from two stop bits to one for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# stopbits 1
```

terminal cli submode-exit

To enable or disable submode-exit on all interactive configuration sessions per VTY, use **terminal cli submode-exit** command in XR EXEC mode.

terminal cli submode-exit

Syntax Description

enable	Enables submode-exit on all interactive configuration sessions per VTY.
disable	Disables submode-exit on all interactive configuration sessions per VTY.

Command Default

No default behavior or values.

Command Modes

XR EXEC mode.

Command History

Release	Modification
Release 6.5.1	This command was introduced.

Usage Guidelines

You cannot enable or disable service cli submode-exit on a different users's VTY session..

```
RP/0/RP0/CPU0:router #terminal cli submode-exit ?
  disable  Disable submode-exit behavior for this config session
  enable   Enable submode-exit behavior for this config session
```

```
RP/0/RP0/CPU0:router #terminal cli submode-exit enable
WARNING: submode-exit enable is already configured at GLOBAL level.This takes precedence
over per-session settings.
```

```
RP/0/RP0/CPU0:router #terminal cli submode-exit disable
```

terminal exec prompt

To specify prompt attributes for the current terminal session, use the **terminal exec prompt** command in the appropriate mode.

terminal exec prompt {**no-timestamp** | **timestamp**}

Syntax Description

no-timestamp	Disables the time-stamp printing before each command.
timestamp	Enables the time-stamp printing before each command.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

Use the**terminal exec prompt** command with the **timestamp** keyword to show the time-stamp display after each command is entered. Use the **terminal exec** command with the **no-timestamp** keyword to disable the time-stamp display.

Note The **terminal** commands are active for the current terminal session only. To apply a setting to all sessions, use the **line** commands.

This example shows how to enable the time-stamp prompt. When enabled, the date and time are displayed after each command. In this example, the **show version** command is entered, and the date and time is displayed.

The following example shows how to disable the time-stamp prompt:

```
RP/0/RP0/CPU0:router# terminal exec prompt no-timestamp
```

terminal exec utility pager

To configure the terminal page display options, use the **terminal exec utility pager** command in the appropriate mode.

terminal exec utility pager {**less** | **more** | **none**}

Syntax Description

less	Specifies to use unix-like "less" bidirectional paging for the terminal display.
more	Specifies to use unix-like "more" unidirectional paging for the terminal display.
none	Specifies that the display is not paginated.

Command Default

No pagination is configured by default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **terminal exec utility pager** command with the **more** keyword to scroll forward through command display one screen at a time. "--More--" is displayed at the end of each screen. Press the Space key to advance one screen. Press the Enter key to advance one line. Press the Esc key to exit the command display.

Task ID

Task ID	Operation
tty-access	Read

This example shows how to limit command display to one screen at a time such that you can move forward through the display:

```
RP/0/RP0/CPU0:router#terminal exec utility pager more
```

terminal length

To set the number of lines that display at one time on the screen for the current terminal session, use the **terminal length** command in

XR EXEC

mode.

terminal length *lines*

Syntax Description

lines	Number of lines that display on a screen. Range is from 0 through 512.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **terminal length** command to set the terminal length value for only the current terminal session and not save it to the running configuration. Exiting from the terminal session returns the terminal length value to the value configured with the **length** command.

Specifying a value of 0 for the *lines* argument prevents the router from pausing between screens of output.

Note The **terminal** commands are active for the current terminal session only. To apply a setting to all sessions, use the **line** commands.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the length for the current terminal session to 120 lines:

```
RP/0/RP0/CPU0:router# terminal length 120
```

Related Commands

Command	Description
length, on page 554	Sets the length of the display terminal.

terminal width

To set the width of the display terminal for the current terminal session, use the **terminal width** command in

XR EXEC

mode.

terminal width *characters*

Syntax Description

characters	Number of characters to display on a screen. Range is from 0 to 512.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **terminal width** command to set the terminal width value for only the current terminal session and not save it to the running configuration. Exiting from the terminal session returns the terminal width value to the value configured with the **width** (display) command.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the terminal width for the current terminal session to 120 characters:

```
RP/0/RP0/CPU0:router# terminal width 120
```

Related Commands

Command	Description
width (display), on page 590	Sets the width of the display terminal.

timestamp disable

To disable time-stamp recording at the top of each command output, use the **timestamp disable** command in the appropriate line configuration mode. To reenable time-stamp recording if disabled, use the **no** form of this command.

timestamp disable
no timestamp disable

Syntax Description

This command has no keywords or arguments.

Command Default

Time-stamp recording at the top of each command output is enabled.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, the time stamp is displayed at the top of any command output. The time stamp records the time at which the command was issued. You can use the **snmp-server view** command to disable this setting so that the time stamp does not appear at the top of the command output. This setting applies to all command outputs on any terminal line to which the current line template applies.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to disable time-stamp recording for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)#  timestamp disable
```

transport input

To define the transport protocols that can be used to access the router, use the **transport input** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport input {**all** | **none** | **ssh** | **telnet**}
no transport input {**all** | **none** | **ssh** | **telnet**}

Syntax Description

all	Specifies the Secure Shell (SSH) and Telnet protocols.
none	Specifies that the router rejects incoming SSH and Telnet transport protocol connections.
ssh	Specifies the SSH transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

All protocols are allowed on the line.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To be accepted, incoming network connections to an asynchronous port (terminal line) must use a transport protocol specified with the **transport input** command. This command can be useful in limiting the acceptable transport protocols to include or exclude those used by different types of users, or to restrict a line to secure connections (SSH connections).

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the transport input setting for the default line template to SSH connections:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport input ssh
```

Related Commands

Command	Description
transport output, on page 584	Determines the protocols that can be used for outgoing connections from a line.
transport preferred, on page 586	Specifies the transport protocol that Cisco IOS XR software uses if the user does not specify one when initiating a connection.

transport output

To specify the transport protocols that can be used for outgoing connections from a line, use the **transport output** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport output {**all** | **none** | **ssh** | **telnet**}
no transport output {**all** | **none** | **ssh** | **telnet**}

Syntax Description

all	Specifies the Secure Shell (SSH) and Telnet transport protocols.
none	Specifies that the router rejects outgoing SSH and Telnet transport protocol connections.
ssh	Specifies the SSH transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

All protocols are allowed on the line.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Any settings made with the **transport output** command override settings made with the **transport preferred** command.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the default line template to prevent any outgoing transport protocol connections:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport output none
```

Related Commands

Command	Description
transport input, on page 582	Defines which protocols to use to connect to a specific line of the router.
transport preferred, on page 586	Specifies the transport protocol that Cisco IOS XR software uses if the user does not specify one when initiating a connection.

transport preferred

To specify the default outgoing transport protocol to be used for initiating network connections, use the **transport preferred** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport preferred {**none** | **ssh** | **telnet**}
no transport preferred {**none** | **ssh** | **telnet**}

Syntax Description

none	Disables the feature.
ssh	Specifies the Secure Shell (SSH) transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

No transport protocol is set as the default outgoing protocol.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **transport preferred** command to provide a default transport protocol to use when initiating outgoing connections. The preferred outgoing transport protocol specified with the **transport preferred** command enables you to initiate an outgoing connection without explicitly specifying the transport protocol.

Cisco IOS XR software assumes that any unrecognized command is a hostname and the software attempts a connection. When the protocol is set to **none**, the system ignores unrecognized commands entered at the EXEC prompt, and does not attempt a connection.

The default setting, the same as using the **transport preferred** command with the **none** keyword, prevents errant connection attempts.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the preferred transport setting for the default line template to SSH:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport preferred ssh
```

Related Commands

Command	Description
transport input, on page 582	Defines which protocols to use to connect to a specific line of the router.
transport output, on page 584	Determines the protocols that can be used for outgoing connections from a line.

vty-pool

To create or modify a virtual terminal line (vty) pool, use the **vty-pool** command in

XR Config

mode. To delete a vty pool, use the **no** form of this command.

vty-pool {**default** | **eem***pool-name*} *first-vty last-vty* [**line-template** {**default***template-name*}]
no vty-pool {**default** | **eem***pool-name*} *first-vty last-vty* [**line-template** {**default***template-name*}]

Syntax Description

default	Specifies the default vty pool.
eem	Specifies the embedded event manager vty pool.
pool-name	User-defined vty pool.
first-vty	First vty line in the pool. • For the default vty pool, you must specify 0 for the first vty line. • For a user-defined vty pool, the range is 5 to 99. • For the embedded event manager vty pool, you must specify 100 for the first vty line.
last-vty	Last vty line in the pool. • The default vty pool must contain at least five vtys. Range is 4 to 99. • For a user-defined vty pool, the range is 5 to 99. • The embedded event manager vty pool must contain at least six vtys. Range is 105 to 199.
line-template	(Optional) Specifies the terminal template to be used in the configuration of virtual terminals in the vty pool.
default	Specifies that the vty pool should reference the default template.
template-name	User-defined template to be applied to the vtys in the vty pool.

Command Default

default *vty-pool* : 5 vtys (vty 0 through 4) referencing the default line template.

eem *vty pool* : 6 vtys (vty 100 through 105) referencing the default line template.

Command Modes

XR Config

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

When creating or modifying vty pools, follow these usage guidelines:

- Before creating or modifying the vty pools, enable the Telnet server using the **telnet server** command in global configuration mode. See *IP Addresses and Services Configuration Guide for Cisco NCS 6000 Series Routers* and *IP Addresses and Services Command Reference for Cisco NCS 6000 Series Routers* for more information.
- The vty range for the default vty pool must start at vty 0 and must contain a minimum of five vtys.
- The vty range from 0 through 99 can reference the default vty pool.
- The vty range from 5 through 99 can reference a user-defined vty pool.
- The vty range from 100 is reserved for the embedded event manager vty pool.
- The vty range for embedded event manager vty pools must start at vty 100 and must contain a minimum of six vtys.
- A vty can be a member of only one vty pool. A vty pool configuration fails if the vty pool includes a vty that is already in another pool.

If you attempt to remove an active vty from the active vty pool when configuring a vty pool, the configuration for that vty pool fails.

This example shows how to configure a user-defined vty pool (test1) that contains vtys 10 through14 and references the user-defined line template test2:

```
RP/0/RP0/CPU0:router(config)# vty-pool test1 10 14 line-template test2
```

width (display)

To set the width of the display terminal, use the **width** command in the appropriate line configuration mode. To remove the **width** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

width *characters*
no width *characters*

Syntax Description

characters	Number of characters to display on a screen. Range is from 0 to 512.

Command Default

characters : 80

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **width** command to modify the default width setting for the specified line template.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the terminal width for the default line template to 99 characters:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# width 99
```

Related Commands

Command	Description
terminal width, on page 580	Sets the width of the display terminal for the current terminal session.

Utility Commands

This module describes the utility commands for Cisco IOS XR software. Utility commands provide CLI equivalents to common UNIX commands.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **universal** keyword can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

- utility cut, on page 592
- utility date, on page 596
- utility date set, on page 599
- utility fgrep, on page 601
- utility find, on page 603
- utility less, on page 605
- utility mv, on page 607
- utility sort, on page 609
- utility tail, on page 612
- utility uniq, on page 614
- utility wc, on page 616

utility cut

To extract selected characters or fields from standard input or from a file, use the **utility cut** command in

XR EXEC

mode.

utility cut {{**list** *character-list* | **fields** *field-list* [**nodelim**] [**delimiter** *delimiter-character*]*WORD*} [**file** *input-file*] | **usage**}

Syntax Description

list *character-list*	(**-c**) Cuts out the characters that are located on each line as specified with the *character-list* argument. The *character-list* argument specifies the character positions or range of the characters to be cut. • Use a comma (,) to indicate more than one character. For example, **utility list 1,2,5** outputs the first, second, and fifth characters. • Use a dash (-) to indicate a range. For example, **utility list 1-64** outputs the first 64 characters of each line, **utility list 5-** outputs the fifth character to the end of the line. **Note** Lines are separated by a delimiter. The default delimiter is tab.
fields *field-list*	(**-f**) Cuts out the fields (lines) as indicated with the *field-list* argument. The *field-list* argument specifies the field numbers or ranges. For example, **utility field 2,9** outputs the second and ninth fields, **utility field 1-3** outputs the first three fields, **utility field -6** outputs the first six fields. **Note** The fields indicated by the *field-list* argument are assumed to be separated in the file by a delimiter character. The default delimiter is tab. Use the **delimiter** *delimiter* option to specify a delimiter character. Lines without field delimiters are processed unless the **nodelim** keyword is specified.
nodelim	(Optional) (**-s**) Ignores lines with no delimiter. Use this optional keyword when the **fields** *field-list* keyword and argument is specified.
delimiter *delimiter-character*	(Optional) (**-d**) Specifies an alternative delimiter to indicate the end of each field. Replace the *delimiter-character* argument with the character used as the delimiter.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
file *input-file*	(Optional) Storage device and directory path of the text file used instead of the standard input (keyboard input). The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.

usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no file is specified, the keyboard input (standard input) is used.

The delimiter is tab.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

The **utility cut** command cuts out columns, fields, or characters displayed from standard input or from a file.

Use the **fields** *field-list* keyword and argument if the fields vary in length from line to line. (The lines must be separated by a delimiter character.) By default, the field delimiter character is the Tab key. Use the **delimiter** *delimiter-character* keyword and argument to specify a different delimiter.

Use the **list** *character-list* keyword and argument only if the fields are of a fixed length. Replace the *character-list* argument with the character positions to be extracted.

For the *character-list* argument, use a comma (,) to indicate more than one character, or use a dash (-) to indicate a range. For example, **utility list 1,2,5** outputs the first, second, and fifth characters, **utility list 1-64** outputs the first 64 characters of each line, **utility list 5-** outputs the fifth character to the end of the line.

You can also use the cut utility as a filter. If no files are specified, the keyboard input (standard input) is used.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **fields** keyword can also be entered using the UNIX-equivalent (**-f**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility cut** command is entered with the **list** *character-list* keyword and argument to display the first 10 characters in each line. The output is from the results of the **show version** command, which is entered with the pipe (|) character:

```
RP/0/RP0/CPU0:router# show version | utility cut list 1-10

  Cisco IOS
  Copyright

  ROM: Syste

  router upt
  System ima

  cisco CRS-
  7457 proce

  16 Gigabit
  2 Ethernet
```

```
  20 Packet
  20 SONET/S
  2043k byte
  38079M byt
  1000592k b
  1000640k b

  Configurat
  Package ac
   --More--
```

In the following example, the **utility cut** command is used to extract fields from a file:

```
RP/0/RP0/CPU0:router# utility cut fields 1,5 delimiter : file disk0:/usr/passwd

  root:Super-User
  daemon:
  bin:
  sys:
  adm:Admin
  lp:Line Printer Admin
  uucp:uucp Admin
  nuucp:uucp Admin
  listen:Network Admin
  nobody:Nobody
```

In the following example, the **utility cut** command is used with the **delimiter** keyword to specify an alternative field delimiter:

```
RP/0/RP0/CPU0:router# utility cut fields 1,4,5 delimiter : file disk0:/usr/passwd

  root:1:Super-User
  daemon:1:
  bin:2:
  sys:3:
  adm:4:Admin
  lp:8:Line Printer Admin
  uucp:5:uucp Admin
  nuucp:9:uucp Admin
  listen:4:Network Admin
```

In the following example, a range of fields is specified:

```
RP/0/RP0/CPU0:router# utility cut fields 1-4 delimiter : file disk0:/usr/passwd

  root:x:0:1
  daemon:x:1:1
  bin:x:2:2
  sys:x:3:3
  adm:x:4:4
  lp:x:71:8
  uucp:x:5:5
  nuucp:x:9:9
  listen:x:37:4
```

In the following example, the **list** *character-list* keyword and argument are used to specify the character positions to be extracted:

```
RP/0/RP0/CPU0:router# utility cut list 1-30 file disk0:/usr/passwd

  root:x:0:1:Super-User:/:/sbin/
  daemon:x:1:1::/:
  bin:x:2:2::/usr/bin:
  sys:x:3:3::/:
  adm:x:4:4:Admin:/var/adm:
  lp:x:71:8:Line Printer Admin:/
  uucp:x:5:5:uucp Admin:/usr/lib
  nuucp:x:9:9:uucp Admin:/var/sp
  listen:x:37:4:Network Admin:/u
  nobody:x:60001:60001:Nobody:/:
  noaccess:x:60002:60002:No Acce
  nobody4:x:65534:65534:SunOS 4.

  ================================================================================
```

In the following example, the UNIX equivalent options are used directly. First, the **utility cut** command is entered with the **usage** keyword to display the possible options. Next, the **utility cut** command is entered with the options to extract the desired data.

```
RP/0/RP0/CPU0:router# utility cut usage

  cut -c list [file], cut -f list [-d delim] [-s] [file]

RP/0/RP0/CPU0:router# utility cut -f 1,4 -d : disk0:/usr/passwd

  root:1
  daemon:1
  bin:2
  sys:3
  adm:4
  lp:8
```

utility date

To display the date and time, use the **utility date** command in

XR EXEC

mode.

utility date {**format** *word* | **universal** | **usage***WORD*}

Syntax Description

format *word*	(Optional) (+) Specifies the format for the date display. Use the online help system to display the available format syntax for the *word* argument.
universal	(Optional) (**-u**) Displays the date in Coordinated Universal Time (UTC) instead of local time. UTC is the standard term for Greenwich Mean Time (GMT).
usage	(Optional) Displays the UNIX options supported by this command.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.

Command Default

The date is displayed in local time.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **utility date** command displays the internal time and date for the router.

Date Format

Use the **format** *word* option to specify the format and content of the displayed date and time. The format is composed of ASCII characters and field descriptors prefaced with %, in a manner similar to a C-language printf() format specifier. In the output, each field descriptor is replaced by its corresponding value; all other characters are copied to the output without change. The format is specified using the following characters:

%C

Century in 'CC' form. For example: 20

%y

Year in 'YY' form. For example: 06

%m

Month in 'MM' form. For example: 08

%d

Date in 'DD' form. For example: 28

%H

Hour in 'hh (24 hr.)' form. For example: 18

%M

Minutes in 'mm' form. For example: 55

%S

seconds in 'ss' form. For example: 24

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **universal** keyword can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

This example shows how to display the router date and time using the **utility date** command:

```
RP/0/RP0/CPU0:router# utility date

  Fri Aug 04 11:53:38 UTC 2006
```

This example shows how to display the router date and time using a variety of options with the **format** keyword:

```
RP/0/RP0/CPU0:router# utility date format "%y%m%d"

  060828

RP/0/RP0/CPU0:router# utility date format "%y-%m-%d"

  06-08-28

RP/0/RP0/CPU0:router# utility date format "%C%y-%m-%d"

  2006-08-28

RP/0/RP0/CPU0:router# utility date format "%C%y-%m-%d:%H:%M:%S"

  2006-08-28:02:09:58

RP/0/RP0/CPU0:router# utility date format "DATE: %y-%m-%d %nTIME: %H:%M:%S"
```

```
DATE: 06-09-17
TIME: 12:42:24
```

Related Commands

Command	Description
utility date set, on page 599	Sets the internal date and time of the router.

utility date set

To set the router time, use the **utility date set** command in mode.

utility date set *hh*:*mm*:*ss*

Syntax Description

hh	Specifies the hour in 2-digit numerical format. Range is 00 to23.
mm	Specifies the minutes in 2-digit numerical format. Range is 0 to 59.
SS	Specifies the seconds in 2-digit numerical format. Range is 0 to 59.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A colon (:) is required between the entry for hour, minutes, and seconds.

Note Generally, if the system is synchronized by a valid outside timing mechanism, such as a Network Time Protocol (NTP) clock source, or if you have a networking device with calendar capability, you need not set the software clock. Use the **date** command or the **clock set** command if no other time sources are available.

Note To manually copy the hardware clock (calendar) settings into the software clock, use the **clock read-calendar** command in EXEC mode.

By default, the system makes a “slow adjustment” if the new time is in the range of the following:

- –2.5 minutes + old time
- 5 minutes + old time

In a slow adjustment, the clock speed increases by less than 100 percent or decreases by less than 50 percent over a period of time from 1 second to 5 minutes until the clock catches up with the new time. This slow adjustment does not cause major discontinuities in the time flow. Use the **-S0** option to disable the slow adjustment.

Task ID

Task ID	Operations
universal	execute

The following example shows how to set the time using the **utility date set** command:

```
RP/0/RP0/CPU0:router(admin)# utility date set 13:07:00

  Fri Sep 15 13:07:00 UTC 2006
```

Related Commands

Command	Description
utility date, on page 596	Displays the internal date and time of the router.

utility fgrep

To search a file for a fixed character string, use the **utility fgrep** command in

XR EXEC

mode.

utility fgrep {**expr** *expression* | **script** *expression-file*} [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility fgrep *expression* [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility fgrep usage

Syntax Description

expr *expression*	(**-e**) A regular expression, whose type is determined by the -e and -f options. This form is used when only one expression is specified on the command line. Any names specified after this option are treated as input files.
script *expression-file*	(**-f**) A file containing a set of regular expressions, each separated by a new line. The type of the expressions is determined by the -e and -f options. This form is used when more than one expression is specified. You can specify more than one -f option. The syntax of the *expression-file* argument is: *device* **:**[*/ directory-path*]*/ filename*
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 20.
count	(Optional) (**-c**) Displays a count of selected lines.
linenum	(Optional) (**-n**) Before each output line, displays the line's line number.
matchfile	(Optional) (**-l**) (“el”) Displays only the names of files containing the selected lines.
matchline	(Optional) (**-x**) Includes only input lines selected against an entire fixed string or regular expression.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
nofile	(Optional) (**-h**) Displays results without a filename prefix attached to the matched lines. This option applies only when more than one file is searched.
reverse	(Optional) (**-v**) Selects only those lines that don't match the specified patterns.
file *search-file*	(Optional) The file used for the search. Replace the *search-file* argument with the device and directory path of the file. The syntax for the *search-file* argument is: *device* **:**[*/ directory-path*]*/ filename*
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

The keyboard input (standard input) is used if no files are specified.

If more than one input file is specified, then the filename is displayed before each line.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **utility fgrep** command searches files for a fixed character string (as opposed to grep and egrep, which search for a a pattern that matches an expression).

The results are displayed to the standard output (terminal screen).

Note The fgrep utility options are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **count** keyword can also be entered using the UNIX-equivalent (**-c**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

The following example, the **utility fgrep** command is used with the **nocase** and **linenum** keywords:

```
RP/0/RP0/CPU0:router# show version | utility fgrep expr uptime nocase linenum

  7:router uptime is 5 days, 20 hours, 10 minutes
```

utility find

To locate files within one or more directories, use the **utility find** command in

XR EXEC

mode.

utility find {**path** *directory-path* {*LINE* | **name** *filename-pattern* | **user** *user-id*} | **usage**}

Syntax Description

path *directory-path*	Specifies the storage device and directory for the file search. The search is performed for the specified directory and all subdirectories in that directory tree. If a directory path is not specified, then the search is performed in the current directory (a path of . [dot] is assumed).
LINE	(Optional) UNIX command-line expressions provided as a string.
name *filename-pattern*	(Optional) Searches for the name of the file. The *filename-pattern* argument is a regular expression string.
user *user-id*	(Optional) Searches for files belonging to a specific user. The *user-id* argument is the username of the file owner.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If a directory path is not specified, then the search is performed in the current directory.

If a **name** *filename-pattern* is not specified, then the search return all files in the specified directory.

If a user is not specified, then the search is performed for all users.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **utility find** command to locate files within one or more directories. You can perform the search for a specific directory (and its subdirectories). If a directory is not specified, then the search is performed for the current directory.

To search for a regular expression string, use the **name** *filename-pattern* keyword and argument. Replace the *filename-pattern* argument with the regular expression string. If this option is not used, then all files within the specified directory are displayed.

To search for files belonging to a specific user, use the *user-id* argument. If this option is not used, then files belonging to all users are displayed.

Task ID

Task ID	Operations
universal	execute

In the following example, the**utility find** command is used to locate the file named "-fwdg-3.8.0". The path is the root directory of disk0:.

```
RP/0/RP0/CPU0:router# utility find path disk0: name hfr-fwdg-3.4.0

disk0:/instdb/admin_pkgs_mdata/hfr-fwdg-3.8.0
disk0:/hfr-fwdg-3.8.0
```

In the following example, the **utility find** command is used to locate files matching a pattern. In this example, all files ending in ".txt" are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr name *.txt

disk0:/usr/test2.txt
```

In the following example, the UNIX equivalent option is used to locate files matching a pattern. In this example, all files ending in ".txt" are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0: -name *.txt

disk0:/-base-3.8.0/etc/vim/doc/editing.txt
disk0:/-base-3.8.0/etc/vim/doc/help.txt
disk0:/-base-3.8.0/etc/vim/doc/intro.txt
disk0:/-base-3.8.0/etc/vim/doc/uganda.txt
disk0:/usr/test2.txt
```

In the following example, the files belonging to a specific user are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr user 0

disk0:/usr
disk0:/usr/passwd
disk0:/usr/test2.txt
```

In the following example, the UNIX equivalent option is used to display files belonging to a specific user:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr -user 0

disk0:/usr
disk0:/usr/passwd
disk0:/usr/test2.txt
```

utility less

To display a file page-by-page, use the **utility less** command in

XR EXEC

mode.

utility less {[**exitEOF**] [*WORD*] | **nocase** | **position** *line-number* | **startat** *string*} [**file** *source-file*]

Syntax Description

exitEOF	(Optional) (**-E**) Automatically exits the utility the first time an end-of-file is encountered.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
position *line-number*	(Optional) (**-j**) Uses the line at *line-number* on the screen to position matched lines during a patter search.
startat *string*	(Optional) (**-p**) Starts at the first occurrence of the pattern specified by the *string* argument in the file.
file *source-file*	(Optional) Specifies the storage device and directory path for the text file to be displayed. The default is standard input. The syntax for the *source-file* argument is: *device* **:**[/ *directory-path*]/ *filename*

Command Default

If no text file is specified, standard input is assumed.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **utility less**command to display files page by page. You can specify regular expressions for pattern matching using the **startat** keyword. You can scroll up as well as down. When you enter the less mode, commands are similar to the “vi” editor.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

The following example, the **utility less** command is used to display the file "config_store". Only part of the file is shown here.

```
RP/0/RP0/CPU0:router# utility less file disk0:/usr/config_store

  Last configuration change at Tue Feb 20 18:34:02 2007 by xxx
  !
  hostname H1
  line console
   exec-timeout 600 0
   session-timeout 600
  !
  line default
   exec-timeout 600 0
   session-timeout 600
  !
  .
  .
  .
```

utility mv

To rename or move a file from one directory to another, use the **utility mv** command in

XR EXEC

mode.

utility mv {[{*WORD* | **force** | **interactive**}] **source** *source-file* **target** *target-file* | **usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
force	(Optional) (**-f**) Forces an overwrite if the target file already exists. There is no confirmation prompt.
interactive	(Optional) (**-i**) Specifies to prompt for confirmation before renaming a file.
source *source-file*	Specifies the storage device, directory, and filename for the file to be moved.
target *target-file*	Specifies the new storage device, directory, and filename for the file.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility mv** command is used to move the file “aaa” from disk0a: to disk1a:

```
RP/0/RP0/CPU0:router# utility mv source disk0a:/aaa target disk1a:/aaa
```

Related Commands

Command	Description
utility cut, on page 592	Cuts characters or lines from the output displayed from standard input or a file.
utility sort, on page 609	Sorts, merges, or sequence-checks the output displayed from standard input or a file.
utility tail, on page 612	Copies the end portion of the output displayed from standard input or a file.

utility sort

To sort, merge, or sequence-check the lines in one or more files, or from the standard input, use the **utility sort** command in

XR EXEC

mode.

utility sort {[{[*WORD*] | [[**dict**] [**fieldSep** *character*] [**ignoreblank**] [**key** *key-definition*] [**lowercase**] [**merge**] [**numeric**] [**outfile** *filename*] [**printable**] [**reverse**] [**unique**]]}] [**file** *filename*] | **usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
dict	(Optional) (**-d**) Sorts in dictionary order. Uses only alphanumeric and blank characters in the sort operation.
fieldSep *character*	(Optional) (**-t**) Specifies a character as the field separator.
ignoreblank	(Optional) (**-b**) Ignores leading blank characters in field comparisons.
key *key-definition*	(Optional) (**-k**) Defines a key to be the sort key. The *key-definition* argument field is defined using the following syntax: *field_start* [*type_string*] [,*field_end*] [*type_string*] • *field_start* and *field_end*—Specifies the beginning and end of the key field. • *type_string*—Specifies attributes specific to the key. The *field_start* and *field_end* arguments are each specified by a pair of digits of the form m.n, where the m refers to the field starting after the mth field separator in a line. For field_start, the .n refers to the nth character of the specified field, and is taken as zero if not specified. For field_end, the .n refers to the nth character after the last character of the specified field, and is taken as zero if not specified. The *type_string* argument may be formed from the characters bdfinr, which apply their defined attributes to the determination of the key. **Note** When ordering options appear independent of key field specifications, the requested field ordering rules are applied globally to all sort keys. When attached to a specific key, the specified ordering options override all global ordering options for that key.
lowercase	(Optional) (**-f**) Folds uppercase letters into lowercase (ignores case and treats upper case characters the same as lowercase characters).
merge	(Optional) (**-m**) Merges sorted files. Assumes that the files are already sorted and so does not sort the files.
numeric	(Optional) (**-n**) Interprets the field as numeric and sorts in numeric order. Includes the sign and optional thousands separator. This keyword also ignores leading blank characters in field comparisons (implies the **ignoreblank** keyword).

outfile *filename*	(Optional) (**-o**) Writes the results to a file. The *filename* argument is the destination disk, directory, and filename. The *filename* argument can be the same as the source file.
printable	(Optional) (**-i**) Ignores all nonprintable characters.
reverse	(Optional) (**-r**) Reverses the sort order. The sort is ascending by default.
unique	(Optional) (**-u**) Suppresses all but one line in each set of lines having equal keys.
file *filename*	(Optional) Specifies a file to be sorted.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no file is specified, then the standard input (keyboard) is used.

If an **outfile** *filename* keyword and argument is not specified, then the standard output (display) is used.

The file is sorted in ascending order.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility sort** command is used to sort the contents of the file "words.txt":

```
RP/0/RP0/CPU0:router# utility sort file disk0:/usr/words.txt

   The
   few
   inquires
  A
  Code.
  Date
  Done
  This
  best-selling
  bestseller
  book
  come
  concerning
  fiction,
  have
```

```
  its
  list
  muscled
  of
  onto
  our
  the
  way
  way
  work
```

In the following example, only the unique characters in the file “words.txt” are displayed:

```
RP/0/RP0/CPU0:router# utility sort unique file disk0:/usr/words.txt

  Code.
  Date
  best-selling
  book
  concerning
  have
  list
  of
  our
  way
  work
```

utility tail

To copy the end portion of a file or the standard input, use the **utility tail** command in

XR EXEC

mode.

utility tail {[{[*WORD*] | [**bytes**] [**continuous**] [**count** *number*]}] [**file** *input-file*] | **usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Copies the end of the file measured in bytes. The default is lines.
continuous	(Optional) (**-f**) Continues to copy data from the end of the file after the last line is reached. The operation pauses for 1 second, and then resumes in a continuous loop. The input file must be a regular file, not a terminal or a FIFO special file (a named pipe).
count *number*	(Optional) (**-n**) Copies the number of lines (default) or bytes specified with the *number* argument. The range is 0 to 4294967295. By default, the last 10 lines are copied. The *number* argument is a decimal integer that defines the location in the file to begin copying: • Include the plus (+) character to copy from the beginning of the file. • Include the minus (-) character to copy from the end of the file. • Do not include a character to copy from the end of the file. **Note** Select the **bytes** keyword to copy the information measured in a count of bytes.
file *input-file*	(Optional) Directory path and filename for the input file. If no file is specified, then the standard input is used. The syntax for the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If the **utility tail** command is entered without keywords or arguments, the last 10 lines of the standard input are copied.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines

Use the **utility tail** command to copy data from the end of a file. By default, the last 10 lines are copied. Use the **bytes** keyword to copy the data measured in bytes. Use the **count** *number* option to define the number of lines or bytes to copy. Use the **file** *filename* option to specify an input file.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility tail** command is used to display the last 10 lines of the output from the **show version** command:

In the following example, the **utility tail** command is used with the bytes keyword to display the last 10 bytes in the output:

```
RP/0/RP0/CPU0:router# show version | utility tail count 10 bytes

  .95.3-p8

RP/0/RP0/CPU0:router#
```

utility uniq

To display or remove repeated lines in a file, use the **utility uniq** command in

XR EXEC

mode.

utility uniq [{[{[*WORD*] | [**afterChars** *number*] [**afterField** *number*] [**count**] [{**nonrepeating** | **repeating**}]}] [**infile** *input-file* **outfile** *output-file*] | **usage**}]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
afterChars *number*	(Optional) (**-s**) Ignores the first characters on each line of the input file. Use the *number* argument to specify the number of characters. The range is 0 to 4294967295.
afterField *number*	(Optional) (**-f**) Ignores the first fields on each line of the input file. Use the *number* argument to specify the number of fields. The range is 0 to 4294967295.
count	(Optional) (**-c**) Displays the number of times the line appeared in the input file at the beginning of each output line.
nonrepeating	(Optional) (**-u**) Displays only the nonrepeating lines from the input file (repeating lines are not displayed).
repeating	(Optional) (**-d**) Displays only the repeating lines from the input file (nonrepeating lines are not displayed).
infile *input-file*	(Optional) Specifies an input file for processing. The *input-file* argument specifies the device, directory, and filename of the input file. If no input file is specified, then the standard input (keyboard) is used. The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
outfile *output-file*	(Optional) Specifies an output file. The *output-file* argument specifies the device, directory, and filename of the output file. If no file is specified, then the standard output (display) is used. The syntax of the *output-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no input file is specified, then the standard input is used.

If no output file is specified, then the standard output is used.

Command Modes XR EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.

Usage Guidelines Use the **utility uniq** command to display only lines that are repeated in a file, or to display only lines that appear once. This utility compares only adjacent lines, so the file or standard input must be sorted.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility uniq** command is used to display the repeating lines in the output of the **show environment** command:

```
RP/0/RP0/CPU0:router# show environment | utility uniq repeating

host    5V              4500,5500       4250,5750       4000,6000
fabricq 1.25V           1125,1375       1063,1438       1000,1500
fabricq 1.25V           1125,1375       1063,1438       1000,1500
ingress 1.25V           1125,1375       1063,1438       1000,1500
spa5    1.5V            1500,0          1575,1425       0,0
host    5V              4500,5500       4250,5750       4000,6000
fabricq 1.25V           1125,1375       1063,1438       1000,1500
fabricq 1.25V           1125,1375       1063,1438       1000,1500
ingress 1.25V           1125,1375       1063,1438       1000,1500
spa5    1.5V            1500,0          1575,1425       0,0
```

utility wc

To count words, lines, or bytes in a file, use the **utility wc** command in

XR EXEC

mode.

utility wc [{[{[*WORD*] | [**bytes**] [**lines**] [**words**]}] [**file** *input-file*] | **usage**}]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Displays the number of bytes in each input file.
lines	(Optional) (**-l**) (-œel-?) Displays the number of lines in each input file.
words	(Optional) (**-w**) Displays the number of words in each input file.
file *input-file*	(Optional) Specifies the input file. The *input-file* argument specifies the device, directory, and filename of the input file. If no input file is specified, then the standard input (keyboard) is used. The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

Output is displayed in the order bytes, words, and lines, even if the options are entered in a different order.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Output is displayed in the following order:

- When keywords are entered, the output appears in the order bytes, words, and lines.
- When no keyword is entered, the output appears in the order lines, words, and bytes.
- When any UNIX equivalent options are entered, the output appears in the order specified by the options. For example, if the command **utility wc -w -l -c** is entered, the output appears in the order words, lines, and bytes.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility wc**command is issued to display the number of lines, words, and bytes in the output of the **show version** command:

```
RP/0/RP0/CPU0:router# show version | utility wc

        221     1160    10820
```

The output displays the following:

- 221 lines
- 1160 words
- 10820 bytes

In the following example, the **utility wc** command is entered with the **words** keyword to display the number of words in the output of the **show version** command:

```
RP/0/RP0/CPU0:router# show version | utility wc words

       1160
```