



System Management Command Reference for the Cisco NCS 6000 Series Router, Release 5.0.x

Americas Headquarters

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

Text Part Number: OL-

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <http://www.cisco.com/go/trademarks>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

© 2013 Cisco Systems, Inc. All rights reserved.



Preface

This reference describes the Cisco IOS XR System Management commands. The preface for *System Management Command Reference for Cisco NCS 6000 Series Routers* contains the following sections:

- [Changes to this Document, page iii](#)
- [Obtaining Documentation and Submitting a Service Request, page iii](#)

Changes to this Document

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

Table 1: Changes to This Document

Revision	Date	Change Summary
OL-30991-01	November 2013	Initial release of this document.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation*, at: <http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>.

Subscribe to *What's New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.



Boot Commands on

This module describes the commands used to boot or reset Cisco IOS XR software.

For more information about ROM Monitor (ROMMON) and boot tasks, see [or](#) .

- [reload, page 2](#)
- [reload \(administration EXEC\), page 4](#)
- [show epm trace boot, page 6](#)
- [show reboot, page 8](#)
- [show variables boot, page 11](#)
- [show variables system, page 13](#)

reload

To reload the , use the **reload** command in XR EXEC mode.

reload

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes EXEC
XR EXEC

Command History	Releases	Modifications
	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 **reload** command to cause the to reload the Cisco IOS XR software according to the configuration register setting (for example, 0x0 to enter ROMMON mode and 0x2 to reload the to EXEC mode). If a standby is in the ready redundancy state, the **reload** command also causes the router to fail over to the standby . Use the **show redundancy** command in EXEC mode to display the status of the standby .

When the **reload** command is used and a switchover occurs, the running (active) software configuration is automatically maintained during switchover.



Caution

If a standby is not installed or is not in the ready state, then the router experiences a loss of service while the active is reloading Cisco IOS XR software. To view the status of the standby , issue the **show redundancy** command in EXEC mode.

If you use the **reload** command and there is no available standby node, you are prompted to continue with the reload:

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

Standby card not present or not Ready for failover. Proceed?[confirm]**y**

Task ID

Task ID	Operations
root-lr	execute

Examples

The following example shows how to reload the active . If a standby is in the ready state, then the router fails over to the standby . If the standby is not installed or is not in the ready state, then the router enters ROMMON mode and routing operations stop.

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

Updating Commit Database. Please wait...[OK]
Proceed with reload? [confirm] y

PCI0 device[7]: Vendor ID 0x10ee
PCI0 device[7]: Device ID 0x300e
PCI1 device[7]: Device ID 0x1100
PCI1 device[7]: Vendor ID 0x1013
PCI1 device[8]: Device ID 0x649
PCI1 device[8]: Vendor ID 0x1095
PCI1 device[9]: Device ID 0x5618
PCI1 device[9]: Vendor ID 0x14e4
PCI1 device[10]: Device ID 0x5618
PCI1 device[10]: Vendor ID 0x14e4
System Bootstrap, Version 1.15(20040120:002852) ,
Copyright (c) 1994-2004 by cisco Systems, Inc.
Board type is 0x100000 (1048576)
Enabling watchdog
Broadcom 5618 #0 Found on PCI
Broadcom 5618 #1 Found on PCI
No. of BCM 56xx switches found 2 .
BCM Switch #0 initialisation complete.
BCM Switch #1 initialisation complete
G4(7450-SMP-GT64260_A) platform with 2048 Mb of main memory

rommon B1 >
```

Related Commands

Command	Description
reload (administration EXEC)	Reloads a node or all nodes on a single chassis or multishelf system.
show redundancy	Displays the status of route processor redundancy.

reload (administration EXEC)

To reload a node or all nodes on a single chassis or multishelf system, use the **reload** command in the appropriate mode.

reload [**location** {*node-id* | **all**} | **rack** *rack-number*]

Syntax Description

location { <i>node-id</i> all }	(Optional) Specifies the node to reload. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation. The all keyword specifies all RP nodes.
rack	Reloads all the nodes on a specified chassis.
<i>rack-number</i>	Rack number of the line card chassis or fabric chassis.

Command Default

None

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

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 reload a specific node on the router, specify the **reload** command with the **location** *node-id* keyword and argument. The *node-id* is expressed in the *rack/slot* notation.

Task ID

Task ID	Operations
root-system	execute

Examples

The following example shows how to reload all nodes on the router:

```
sysadmin:vm_0 # reload location all
```


**Note**

To ensure the sanity of the configuration file system, enter the **cfs check** command .

Related Commands

Command	Description
cfs check	Performs a check of the Configuration File System (CFS).
reload	Reloads the .
show redundancy	Displays the status of route processor redundancy.

show epm trace boot

To display execution path monitoring traces, use the **show epm trace boot** command in XR EXEC mode.

show epm trace boot [**hexdump**] [**last** *n*] [**reverse**] [**stats**] [**tailf**] [**unique**][**verbose**] [**wrapping**][**file** *filename original*] [**location** {*node-id* | **all**}]

Syntax Description

hexdump	(Optional) Displays traces in hexadecimal format.
last <i>n</i>	(Optional) Displays the last <i>n</i> 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 <i>filename original</i>	(Optional) Specifies the filename of the file to display. You can specify up to four trace files.
location { <i>node-id</i> all }	(Optional) Specifies the node of the . The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation. You can specify up to four nodes. The all keyword specifies all nodes.

Command Default

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 **show epm trace boot** command provides a simple way of tracking and time-stamping critical events to clearly understand their temporal relationship to one another and the amount of time spent performing critical operations.

Task ID

Task ID	Operations
basic services	read

Examples

The following example shows sample output from the **show epm trace boot** command:

```
RP/0/RP0/CPU0:router#sh epm trace boot
Tue Nov 12 11:16:42.993 UTC
14 wrapping entries (1088 possible, 64 allocated, 0 filtered, 14 total)
Nov  7 06:22:13.574 epm/boot 0/RP0/CPU0 t2024 @ 00:00:11 - [processmgr] process-start
Nov  7 06:22:14.890 epm/boot 0/RP0/CPU0 t2070 @ 00:00:12 - [processmgr] start-level: admin
Nov  7 06:22:53.375 epm/boot 0/RP0/CPU0 t2086 @ 00:00:51 - [devc-conaux-con] exec-available
Nov  7 06:22:55.843 epm/boot 0/RP0/CPU0 t2071 @ 00:00:53 - [processmgr] admin-plane-up
Nov  7 06:22:55.915 epm/boot 0/RP0/CPU0 t2070 @ 00:00:53 - [processmgr] start-level: infra
Nov  7 06:23:12.619 epm/boot 0/RP0/CPU0 t2070 @ 00:01:10 - [processmgr] start-level: active
Nov  7 06:23:30.739 epm/boot 0/RP0/CPU0 t3147 @ 00:01:28 - [placed] pi-plane-up
Nov  7 06:23:30.740 epm/boot 0/RP0/CPU0 t3147 @ 00:01:28 - [placed] pi-plane-up
Nov  7 06:23:33.756 epm/boot 0/RP0/CPU0 t2070 @ 00:01:31 - [processmgr] start-level: final
Nov  7 06:23:50.740 epm/boot 0/RP0/CPU0 t3147 @ 00:01:48 - [placed] lr-plane-up
Nov  7 06:23:54.745 epm/boot 0/RP0/CPU0 t3155 @ 00:01:52 - [cfgmgr-rp] lr-config-start
Nov  7 06:24:52.640 epm/boot 0/RP0/CPU0 t3155 @ 00:02:50 - [cfgmgr-rp] lr-config-done
Nov  7 06:24:52.715 epm/boot 0/RP0/CPU0 t3155 @ 00:02:50 - [cfgmgr-rp]
bulk-interface-config-start
Nov  7 06:24:52.765 epm/boot 0/RP0/CPU0 t3177 @ 00:02:50 - [cfgmgr-rp] node-config-done
```

In this sample output, the time stamp following the @ sign is the elapsed time in the format hh:mm:ss since the execution phase started (for example, since node start, in the case of a boot).

show reboot

To display reboot information for a node, use the **show reboot** command in System Admin EXEC or XR EXEC mode.

show reboot {**history** |[**reverse**]| **pcds**} **location** *node-id*

Syntax Description

first	(Optional) Displays information about the first ungraceful reboot.
last	(Optional) Displays information about the last ungraceful reboot.
crashinfo	Displays crash information for an ungraceful reboot.
syslog	Displays the syslogs related to an ungraceful reboot.
trace	Displays trace information for an ungraceful reboot.
graceful	Displays information about the last graceful reboot.
history	Displays the reboot history of a specific node.
reverse	(Optional) Displays the reboot history information in reverse chronological order.
pcds	Displays PCDS critical information about the last ungraceful reboot.
location <i>node-id</i>	Specifies which node to reload. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation.

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.

The **history** keyword for the **show reboot** command displays all reboot causes stored for previous node resets.

Crash information (**crashinfo**), syslog, and kernel dumper ltrace (**trace**) can be displayed for the first or last reboot if it is an ungraceful reboot.

Task ID

Task ID	Operations
system	read

Examples

This example shows the output of the **show reboot** command in Admin EXEC mode:

```
RP/0/RP0/CPU0:router # show reboot
Card Reboot History for 0/FC0
0
  Timestamp      "Mon Oct 28 05:01:18 2013"
  Reason Code    7
  Reason         "ADMIN CLI RELOAD GRACEFUL"
  Src Location    ""
  Src Name       "CONFD USER"
1
  Timestamp      "Thu Oct 24 00:33:47 2013"
  Reason Code    15
  Reason         "Fault (Id: 0x6000a000000000e) "
  Src Location    0/FC0
  Src Name       FAM_AGENT_CALV_DRIVER_SFE
2
  Timestamp      "Thu Oct 24 00:30:15 2013"
  Reason Code    15
  Reason         "Fault (Id: 0x6000a000000000e) "
  Src Location    0/FC0
  Src Name       FAM_AGENT_CALV_DRIVER_SFE
3
  Timestamp      "Thu Oct 24 00:26:44 2013"
  Reason Code    15
  Reason         "Fault (Id: 0x6000a000000000e) "
  Src Location    0/FC0
  Src Name       FAM_AGENT_CALV_DRIVER_SFE
4
  Timestamp      "Thu Oct 24 00:23:12 2013"
  Reason Code    15
  Reason         "Fault (Id: 0x6000a000000000e) "
  Src Location    0/FC0
  Src Name       FAM_AGENT_CALV_DRIVER_SFE
5
  Timestamp      "Thu Oct 24 00:19:40 2013"
  Reason Code    15
  Reason         "Fault (Id: 0x6000a000000000e) "
  Src Location    0/FC0
  Src Name       FAM_AGENT_CALV_DRIVER_SFE
6
  Timestamp      "Thu Oct 24 00:16:09 2013"
  Reason Code    15
  Reason         "Fault (Id: 0x6000a000000000e) "
  Src Location    0/FC0
  Src Name       FAM_AGENT_CALV_DRIVER_SFE
7
```

```

Timestamp      "Thu Oct 24 00:12:37 2013"
Reason Code    15
Reason         "Fault (Id: 0x6000a0000000000e)"
Src Location    0/FC0
Src Name        FAM_AGENT_CALV_DRIVER_SFE
8
Timestamp      "Thu Oct 24 00:09:05 2013"
Reason Code    15
Reason         "Fault (Id: 0x6000a0000000000e)"
Src Location    0/FC0
Src Name        FAM_AGENT_CALV_DRIVER_SFE
9
Timestamp      "Thu Oct 24 00:05:34 2013"
Reason Code    15
Reason         "Fault (Id: 0x6000a0000000000e)"
Src Location    0/FC0
Src Name        FAM_AGENT_CALV_DRIVER_SFE

```

This example shows sample output from the **show reboot** command with the **history** keyword:

```
RP/0/RP0/CPU0:router# show reboot history location 0/rp0/cpu0
```

No	Time	Cause Code	Reason
01	Thu Jul 19 00:25:03 2007	0x00000001	Cause: User Initiated reload Process: reload Traceback: fc1941a0 fc194290 fc0 42d90 48200624 48202120 0
02	Thu Jul 19 20:32:57 2007	0x21000010	Cause: Missed deadline, client: sc-reddrv-main, timeout: 5 Process: wd-critical-mon Traceback: fc1941a0 fc194290 482 00738 482013cc 48201c04 fc1d4fb0
03	Thu Jul 19 22:21:05 2007	0x00000000	
04	Thu Jul 19 22:44:37 2007	0x00000045	Cause: Non-dSC node booted with composite image Process: insthelper Traceback: fc1941a0 fc194290 fc6 1e4a0 4820f928 48210654 48201cc0
05	Thu Jul 19 22:52:19 2007	0x00000045	Cause: Non-dSC node booted with composite image Process: insthelper Traceback: fc1941a0 fc194290 fc6 204a0 4820f928 48210654 48201cc0
06	Fri Jul 20 02:10:51 2007	0x00000001	Cause: User Initiated reload Process: reload Traceback: fc15a1a0 fc15a290 fc0 45d90 48200624 48202120 0
07	Mon Jul 23 19:39:49 2007	0x00000045	Cause: RP cold booted with incorrect software Process: insthelper Traceback: fc1941a0 fc194290 fc6 1a4a0 4820f8b0 48210fc8 48201cc0
08	Mon Jul 23 19:54:45 2007	0x00000002	Cause: User Initiated Reboot Process: reboot Traceback: fc1941a0 fc194290 482 00154 48201468 0 0

Related Commands

Command	Description
reload	Reloads the .

show variables boot

To display the configuration register setting and boot file setting for the in the system, use the **show variables boot** command in administration

XR EXEC

mode.

show variables boot [**location** {**all** | *node-id*}]

Syntax Description

location { <i>node-id</i> all }	(Optional) Specifies the node to reload. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation. Use the all keyword to indicate all nodes.

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.

Use the **show variables boot** command to display system boot variables for the router. This command displays the configuration register setting and boot file setting for the in the system. Use the **location** *node-id* keyword and argument to display the configuration register setting for a specific card.

The configuration register setting is set with the **config-register** command. The boot variable is set in ROM Monitor mode. For more information about ROM Monitor mode, see .

Task ID

Task ID	Operations
root-lr	read

Examples

This example shows sample output from the **show variables boot** command:

```
RP/0/RP0/CPU0:router # show variables boot
Tue Nov 12 10:46:31.368 UTC
CALVADOS_IP_ADDR=192.0.0.1
CALVADOS_CTRL_ETH_VLAN=3073
GUEST_MAC_ADDR=00:11:22:00:10:00
GUEST_IP_ADDR=192.0.0.3
GUEST_CTRL_ETH_VLAN=3074
GUEST_MGMT_ETH_VLAN=514
MY_SLOT_NUM=0
MY_CARD_TYPE=1
The bytes read were...
43 41 4c 56 41
```

Related Commands

Command	Description
show variables system	Displays internal system environmental variables.
show version	Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.

show variables system

To display internal system environmental variables set on the router, use the **show variables system** command in XR EXEC mode.

show variables system

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 variables system** command to display system environmental variables for the router.

To display the configuration register setting, use the **show variables boot** command in administration EXEC mode.

Task ID	Task ID	Operations
	basic-services	read

Examples

This example illustrates sample output from the **show variables system** command. The output is meant to be interpreted by Cisco personnel.

```
RP/0/RP0/CPU0:router# show variables system

TERM=vt220
GDB_PDEBUG=-P1
TERM=vt100
```

show variables system

```

DIR_PREFIX=.
LOADPATH=/pkg
LD_LIBRARY_PATH=/pkg/lib
PATH=/pkg/bin
BFM_CONFIG_PATH=/pkg/bfm/config
BGP_PATH=/pkg/bgp
CONFIGS_PATH=/pkg/configs
CRAFT_PATH=/pkg/cwi
CTF_PATH=/pkg/ctf
DM_RULES_PATH=/pkg/dm/rules
ETC_PATH=/pkg/etc
FPD_PATH=/pkg/fpd
IM_RULES_PATH=/pkg/rules
INIT_STARTUP_PATH=/pkg/init.d
INSTHELPER_PATH=/pkg/other
MAN_PATH=/pkg/man
MIB_LIBRARY_PATH=/pkg/lib/mib
MIB_PATH=/pkg/mib
NETIO_SCRIPT_PATH=/pkg/script
PARSER_PATH=/pkg/parser
PARTITIONS_PATH=/pkg/partitions
QOS_PATH=/pkg/qos
SCHEMA_PATH=/pkg/schema
STARTUP_PATH=/pkg/startup
TCL_LIBRARY=/pkg/lib/tcl
UCODE_PATH=/pkg/gsr/ucode
UCODE_ROOT_PATH=/pkg/ucode
VCM_RULES_PATH=/pkg/vcmrules
JOB_ID=0
INSTANCE_ID=1
SYSMGR_TUPLE=
SYSMGR_NODE=node0_0_CPU0
EXIT_STATUS=0
SYSMGR_RESTART_REASON=0
AAA_USER=labuser
EXEC_PID=18280619
TASKID_MAP_SIZE=72
HOME=/disk0:/usr
TMPDIR=/disk0:/var/tmp
PWD=/disk0:/usr

```

Related Commands

Command	Description
show variables boot	Displays the configuration register setting and boot file setting for the in the system.
show version	Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.



Bulk Content Downloader (BCDL) Commands on

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.

- [show bcdl](#), page 16
- [show bcdl consumers](#), page 19
- [show bcdl queues](#), page 21
- [show bcdl tables](#), page 22
- [show bcdl trace](#), page 24

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

Examples

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.

Field	Description
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 <i>rack/slot</i> notation, in which the agent is running.
pulse	Pulse code used by the producer to pulse the BCDL agent.
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.

show bcdl

Field	Description
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

<i>group_name</i>	(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

Examples

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 16](#).

Table 3: show bcdl consumers Field Descriptions

Field	Description
PID	Process identifier.
node	Consumer node, expressed in the <i>rack/slot</i> 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.
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

<i>group_name</i>	(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

Examples

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

[Table 2: show bcdl Field Descriptions, on page 16](#) and [Table 3: show bcdl consumers Field Descriptions, on page 19](#) 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

<i>group_name</i>	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

Examples

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 16](#) or [Table 3: show bcdl consumers Field Descriptions, on page 19](#) are described in this table.

Table 4: show bcdl tables Field Descriptions

Field	Description
sgs	Number of subgroups.

Field	Description
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.
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

<i>group_name</i>	(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 <i>n</i>	(Optional) Displays the last <i>n</i> 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 <i>filename</i> original location <i>node-id</i>	(Optional) Specifies a filename and original location of the file to display.
location { <i>node-id</i> all }	Specifies the RP node for which to display the execution path monitoring information. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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 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

Examples

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

 `show bcdl trace`



CDP Commands on

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, page 28](#)
- [cdp advertise v1, page 30](#)
- [cdp holdtime, page 32](#)
- [cdp log adjacency changes, page 34](#)
- [cdp timer, page 36](#)
- [show cdp, page 38](#)
- [show cdp entry, page 40](#)
- [show cdp interface, page 43](#)
- [show cdp neighbors, page 46](#)
- [show cdp traffic, page 50](#)

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

Examples

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)# interface gigabitethernet 0/0/0/1
RP/0/RP0/CPU0:router(config-if)# cdp
```

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

```
RP/0/RP0/CPU0:router(config)# interface gigabitethernet 0/0/0/1
RP/0/RP0/CPU0:router(config-if)# no cdp
```

Related Commands

Command	Description
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.

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

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

Examples

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 Commands

Command	Description
cdp	Enables the Cisco Discovery Protocol globally or on an interface.
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.

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

<i>seconds</i>	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

Examples

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 Commands

Command	Description
cdp timer	Specifies how often the software sends Cisco Discovery Protocol updates.
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.

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

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

Examples 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
```

When CDP adjacency table logging is enabled, a syslog is generated each time a CDP neighbor is added or removed. The following is an example of the log entry:

```
LC/0/5/CPU0:Jun 5 10:51:18.081 : cdp[109]: %L2-CDP-6-DELETED NEIGHBOR :
CDP Neighbour TBA04110127 on interface GigabitEthernet0/5/0/0
```

```
has been deleted, remote interface 3/2  
LC/0/5/CPU0:Jun  5 10:51:33.120 : cdp[109]: %L2-CDP-6-NEW_NEIGHBOR :  
New CDP neighbor TBA04110127 detected on interface GigabitEthernet0/5/0/0,  
remote interface 3/2
```

Related Commands

Command	Description
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.

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

<i>seconds</i>	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

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

Examples

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 Commands

Command	Description
cdp holdtime	Specifies the time for which the receiving device should hold a Cisco Discovery Protocol.
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.

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

Examples

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.
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 Commands

Command	Description
cdp advertise v1	Changes the version of Cisco Discovery Protocol that is used to communicate with neighboring devices to version 1.
cdp holdtime	Specifies the time for which the receiving device should hold a Cisco Discovery Protocol.
cdp timer	Specifies how often the software sends Cisco Discovery Protocol updates.
show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using Cisco Discovery Protocol.
show cdp interface	Displays information about the interfaces on which Cisco Discovery Protocol (CDP) is enabled.
show cdp neighbors	Displays detailed information about neighboring devices discovered using Cisco Discovery Protocol.
show cdp traffic	Displays information about the traffic gathered between devices using Cisco Discovery Protocol.

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.
<i>entry-name</i>	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

Examples

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 <i>rack / slot / module / port</i> 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.

Field	Description
Native VLAN	VLAN ID.
Duplex	Duplex setting: half or full.

Related Commands

Command	Description
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.
show cdp interface	Displays information about the interfaces on which Cisco Discovery Protocol (CDP) is enabled.
show cdp neighbors	Displays detailed information about neighboring devices discovered using Cisco Discovery Protocol.
show cdp traffic	Displays information about the traffic gathered between devices using Cisco Discovery Protocol.

show cdp interface

To display information about the interfaces on which Cisco Discovery Protocol (CDP) is enabled, use the **show cdp interface** command in

XR EXEC

show cdp interface [*type interface-path-id*] **location** *node-id*]

Syntax Description

<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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 <i>node-id</i>	(Optional) Displays detailed CDP information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.

Command Default

This command displays information about the interfaces on which CDP has been enabled.

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 cdp interface** command to display information about any CDP interfaces. When an interface is specified in the command syntax, information is displayed about the specific interface. Not specifying the interface displays information about all interfaces.

Task ID

Task ID	Operations
cdp	read, write

Examples

The following example shows sample output from the **show cdp interface** command. Information about the status, CDP timer, and holdtime settings is displayed for all interfaces on which CDP is enabled.

```
RP/0/RP0/CPU0:router# show cdp interface
POS0/2/0/0 is Up
  Encapsulation HDLC
  Sending CDP packets every 120 seconds
  Holdtime is 240 seconds
POS0/2/0/1 is Up
  Encapsulation HDLC
  Sending CDP packets every 120 seconds
  Holdtime is 240 seconds
POS0/2/0/2 is Up
  Encapsulation HDLC
  Sending CDP packets every 120 seconds
  Holdtime is 240 seconds
POS0/2/0/3 is Up
  Encapsulation HDLC
  Sending CDP packets every 120 seconds
  Holdtime is 240 seconds
MgmtEth0/RP1/CPU0/0 is Up
  Encapsulation ARPA
  Sending CDP packets every 120 seconds
  Holdtime is 240 seconds
```

The following example shows sample output from the **show cdp interface** command with an interface specified. Information about the status, CDP timer, and holdtime settings is displayed for Packet-over-SONET/SDH (POS) interface 0/2/0/1 only.

```
RP/0/RP0/CPU0:router# show cdp interface pos 0/2/0/1
POS0/2/0/1 is Up
  Encapsulation HDLC
  Sending CDP packets every 60 seconds
  Holdtime is 180 seconds
```

Table 7: show cdp interface Field Descriptions

Field	Description
POS0/2/0/1 is Up	Current condition of POS interface 0/0/2/1.
Encapsulation HDLC	Interface is encoding packets using the Cisco HDLC Layer 2 encapsulation.
Sending CDP packets every 60 seconds	Interval between transmissions of CDP advertisements. This field is controlled by the cdp timer command.

Field	Description
Holdtime is 180 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.

Related Commands

Command	Description
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.
show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using Cisco Discovery Protocol.
show cdp neighbors	Displays detailed information about neighboring devices discovered using Cisco Discovery Protocol.
show cdp traffic	Displays information about the traffic gathered between devices using Cisco Discovery Protocol.

show cdp neighbors

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

XR EXEC

mode.

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

Syntax Description

<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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 <i>node-id</i>	(Optional) Displays detailed CDP information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> 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.
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 cdp 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

Examples

The following example shows sample output from the **show cdp 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
TBA04110127      Gi0/7/0/0       173        T S          WS-C6506   3/9
cisco_1          Gi0/7/0/2       171        R
                  Gi0/4/0/2
```

Table 8: show cdp neighbors Field Descriptions

Field	Description
Capability Codes	Type of device that can be discovered.
Device ID	Name of the neighbor device.
Local Intrfce	Protocol being used by the connectivity media and the interface number.
Holdtme	Remaining time, in seconds, for which the current device holds the CDP advertisement from a sending router before discarding it.

Field	Description
Capability	Type of the device listed in the CDP Neighbors table. Values are as follows: R—Router T—Transparent bridge B—Source-routing bridge S—Switch H—Host I—Internet Group Management Protocol (IGMP) device r—Repeater
Platform	Product number of the device.
Port ID	Protocol and port number of the device.

The following examples illustrates sample output for IPv4 and IPv6 neighbors from the **show cdp neighbors** command with the **detail** keyword:

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

```
-----
Device ID: uut-user
SysName : uut-user
Entry address(es):
IPv4 address: 1.1.1.1
IPv6 address: 1::1
IPv6 address: 2::2
Platform: cisco 12008/GRP, Capabilities: Router
Interface: Gi0/4/0/3
Port ID (outgoing port): Gi0/2/0/3
Holdtime : 177 sec

Version :
Cisco IOS XR Software, Version 0.0.0[Default]
Copyright (c) 2005 by cisco Systems, Inc.

advertisement version: 2
```

Table 9: show cdp neighbors detail Field Descriptions

Field	Definition
Device ID	Name of the neighbor device.
Entry address(es)	List of network addresses of neighbor devices. The address can be in IP or in Connectionless Network Service (CLNS) protocol conventions.
Platform	Product name and number of the neighbor device.

Field	Definition
Capabilities	Device type of the neighbor. This device can be a router, a bridge, a transparent bridge, a source-routing bridge, a switch, a host, an IGMP device, or a repeater.
Interface	Interface being used by the connectivity medium.
Port ID	Port number of the port on the current device.
Holdtime	Remaining time (in seconds) for which the current device holds the CDP advertisement from a sending router before discarding it.
Version	Software version of the neighbor device.
advertisement version	Version number of the advertising protocol.

Related Commands

Command	Description
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.
show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using Cisco Discovery Protocol.
show cdp interface	Displays information about the interfaces on which Cisco Discovery Protocol (CDP) is enabled.
show cdp traffic	Displays information about the traffic gathered between devices using Cisco Discovery Protocol.

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

Examples

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 10: 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.

Field	Definition
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 Commands

Command	Description
show cdp	Displays global Cisco Discovery Protocol information, including CDP version, timer, and holdtime information.
show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using Cisco Discovery Protocol.
show cdp interface	Displays information about the interfaces on which Cisco Discovery Protocol (CDP) is enabled.
show cdp neighbors	Displays detailed information about neighboring devices discovered using Cisco Discovery Protocol.



Clock Commands on

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 Commands on

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, page 56](#)
- [clock set, page 58](#)
- [clock timezone, page 60](#)
- [clock update-calendar, page 64](#)
- [locale country, page 66](#)
- [locale language, page 68](#)
- [show clock, page 70](#)

clock read-calendar

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

clock read-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

Read calendar is disabled.

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

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

Examples

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 Commands

Command	Description
clock set	Changes the software clock settings.

Command	Description
clock update-calendar	Copies the software clock settings to the hardware clock (calendar).
show clock	Displays the system clock.
update-calendar	Updates the calendar periodically from NTP.

clock set

To change the software clock settings, use the **clock set** command in XR EXEC

or
System Admin EXEC
mode.

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

Syntax Description

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

Command Default

Clock is not set.

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.

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

Examples**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
```

Examples

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
```

Examples

This example shows how to display the available months using the online help (?) function:

```
RP/0/RP0/CPU0:router# clock set 06:10:00 12 ?
    january      Month of the Year
    february
    march
    april
    may
    june
    july
    august
    september
    october
    november
    december
```

Related Commands

Command	Description
clock timezone	Sets the time zone for display.
show clock	Displays the system clock.

clock timezone

To set the time zone for display, use the **clock timezone** command in System Admin Config and 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

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

Command Default

UTC

Command Modes

System Admin Config
XR Config

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 11: 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.

Acronym	Time Zone Name and UTC Offset
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.
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.

Acronym	Time Zone Name and UTC Offset
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 12: 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.

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

Task ID

Task ID	Operations
host-services	read, write

Examples

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 Commands

Command	Description
clock set	Changes the software clock settings.
show clock	Displays the system clock.

clock update-calendar

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

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

Examples 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 Commands

Command	Description
clock read-calendar	Manually copies the hardware clock (calendar) settings into the software clock.

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

<i>country</i>	Country, where <i>country</i> 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

Examples

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

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

Related Commands

Command	Description
locale language	Sets the default language of use.

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

<i>language</i>	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

Examples

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

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

Related Commands

Command	Description
locale country	Sets the default country of use.

show clock

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

or
System Admin 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

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.

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 13: show clock Display Leading Symbol Descriptions

Symbol	Description
*	Time is not authoritative.

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

Task ID

Task ID	Operations
basic-services	read

Examples

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 Commands

Command	Description
clock set	Changes the software clock settings.



Configuration Management Commands on

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](#), page 75
- [admin](#), page 77
- [alias](#), page 79
- [apply-template](#), page 82
- [clear comment](#), page 84
- [clear configuration commits](#), page 86
- [clear configuration inconsistency](#), page 88
- [clear configuration inconsistency replica](#), page 91
- [configure](#), page 93
- [description \(interface\)](#), page 96
- [do](#), page 98
- [end](#), page 100
- [end-template](#), page 102
- [exit](#), page 104
- [hostname](#), page 106
- [load commit changes](#), page 107
- [load configuration failed](#), page 109
- [load rollback changes](#), page 111
- [man](#), page 113
- [pwd \(config\)](#), page 116
- [rollback configuration](#), page 117
- [root](#), page 120

- [save configuration, page 122](#)
- [save configuration changes, page 124](#)
- [save configuration commit changes, page 126](#)
- [save configuration failed, page 128](#)
- [save configuration merge, page 130](#)
- [save rollback changes, page 132](#)
- [set default-afi, page 134](#)
- [set default-safi, page 136](#)
- [set default-vrf, page 138](#)
- [show aliases, page 140](#)
- [show configuration \(config\), page 142](#)
- [show configuration changes, page 144](#)
- [show configuration failed \(config\), page 146](#)
- [show configuration failed remove, page 148](#)
- [show configuration history, page 150](#)
- [show configuration inconsistency replica, page 154](#)
- [show configuration persistent, page 156](#)
- [show configuration running, page 158](#)
- [show configuration sessions, page 160](#)
- [show default-afi-safi-vrf, page 162](#)
- [show running-config, page 164](#)
- [template, page 167](#)

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

Examples 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 gigabitethernet 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv4 address 1.1.1.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# abort
RP/0/RP0/CPU0:router#
```

Related Commands

Command	Description
end	Terminates a session and returns the router to EXEC mode from any configuration mode.
exit	Exits from the current configuration mode to the next higher command mode or logs out of the terminal session.

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

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 **admin** command to enter System Admin EXEC 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.

Task ID	Task ID	Operations
	admin	read, write, execute

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

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

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

Related Commands

Command	Description
configure	Enters global configuration mode.

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

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

Command Default

No command aliases 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.

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

Examples

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# configure
RP/0/RP0/CPU0:router(config)# alias ipbr show ipv4 interface brief
RP/0/RP0/CPU0:router(config)# show configuration

Building configuration...
alias ipbr show ipv4 interface brief
end
RP/0/RP0/CPU0:router(config)# commit
RP/0/0/CPU0:Feb 21 04:42:57.017 : config[65689]: %MGBL-LIBTARCFG-6-COMMIT :
Configuration committed by user 'lab'. Use 'show configuration commit changes 1000000022'
to view the changes.
RP/0/0/CPU0:router(config)# end
RP/0/RP0/CPU0:Mar 27 22:19:05 : config[65739]: %SYS-5-CONFIG_I : Configured from console
by lab
RP/0/RP0/CPU0:router# ipbr
RP/0/RP0/CPU0:router# show ipv4 interface brief

Interface                IP-Address      Status          Protocol
Loopback0                1.1.1.1         Up              Up
Loopback999              unassigned      Up              Up
MgmtEth0/0/CPU0/0        12.29.56.21     Up              Up
RP/0/RP0/CPU0:router#
```

The following example shows how to define an alias, mycompany-10ge, for POS interface 1/0/2/3 and then how to use that alias to shut down the interface:

```
RP/0/RP0/CPU0:router(config)# alias mycompany-10ge gigabitethernet1/0/2/3
RP/0/RP0/CPU0:router(config)# interface mycompany-10ge
RP/0/RP0/CPU0:router(config-if)# shutdown
RP/0/RP0/CPU0:router(config-if)# exit
RP/0/RP0/CPU0:router(config)#
```

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
```

The following example shows the use of the alias shint_both in XR EXEC mode:

```
RP/0/RP0/CPU0:router(exec)# shint_both(gigabitethernet1/2/3/4)
```

Two commands are issued, as follows:

```
RP/0/RP0/CPU0:router(exec)# show interface gigabitethernet1/2/3/4; show run interface gigabitethernet1/2/3/4
```

Related Commands

Command	Description
show aliases	Displays a summary of all command aliases.

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

Command Default No templates are applied to the target configuration.

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 **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

Examples 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 Commands

Command	Description
end-template	Exits template configuration mode.
show running-config	Displays the current running (active) configuration.
template	Defines a template.

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

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 **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

Examples

The following example shows how to discard the comment associated with the configuration ipv4 address 1.1.1.1 255.0.0.0.

```
RP/0/RP0/CPU0:router(config-if)# clear comment  
RP/0/RP0/CPU0:router(config-if)# ipv4 address 1.1.1.1 255.0.0.0
```

clear configuration commits

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

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

Syntax Description

diskspace <i>kilobytes</i>	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 <i>kilobytes</i> 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 <i>number-of-commits</i>	Deletes the number of commit IDs specified for the <i>number-of-commits</i> argument.
	Note Use the online help (?) function to display the range of commit IDs available for deletion.

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 **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

Examples

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 Commands

Command	Description
rollback configuration	Rolls back the configuration to a previous commit.

clear configuration inconsistency

To clear an inconsistency alarm for an SDR configuration or admin plane configuration, use the **clear configuration inconsistency** command in 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 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.

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

Examples

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 alarm** 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 Commands

Command	Description
load configuration failed	Populates the target configuration with the contents of the previous failed configuration from the startup configuration.

 clear configuration inconsistency

Command	Description
show configuration history	Displays history of configuration changes.

clear configuration inconsistency replica

To resolve configuration inconsistencies on a replica node, use the **clear configuration inconsistency replica** command in XR EXEC mode.

clear configuration inconsistency replica location *node-id*

Syntax Description

location <i>node-id</i>	Resolves the configuration inconsistencies on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation.

Command Default

XR EXEC mode: Resolves any configuration inconsistencies for the 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 XR EXEC mode, the replica nodes are the route processors (RPs) or distributed route processors (DRPs) that can become the designated secure domain router shelf controller (DSDRSC).

Use the **clear configuration inconsistency replica** command if there is a configuration inconsistency between the standby DSC and the current active DSC; or alternatively, if the configuration on any nodes that could become the DSC is not the same as the configuration on the current DSC. To determine if you have a configuration inconsistency, use the **show configuration inconsistency replica** command.

To clear configuration inconsistencies for an SDR configuration, enter the **clear configuration inconsistency replica** command in XR EXEC mode for that SDR.

Task ID

Task ID	Operations
config-services	execute

Examples

The following example shows how to clear any configuration inconsistencies for the DSC configuration by using the **clear configuration inconsistency replica** command in XR EXEC mode:

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

The replica has been repaired.

Related Commands

Command	Description
show configuration inconsistency replica	Displays any configuration inconsistencies on a standby node.

configure

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

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 EXEC mode

Use the **configure** command in XR EXEC mode to enter XR EXEC 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 EXEC mode

Use the **configure** command in mode to enter System Admin EXEC 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 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 or System Admin EXEC 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 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.

Examples

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 for Gigabit Ethernet interface 0/1/0/0. In the example, the **configure** command commits the configuration, and the **end** command terminates the configuration session and return the router to XR EXEC mode.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router (config) # interface gigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router (config-if) # ipv4 address 1.1.1.1 255.0.0.0
RP/0/RP0/CPU0:router (config-if) # commit
RP/0/RP0/CPU0:router (config-if) # end
RP/0/RP0/CPU0:router#
```

Related Commands

Command	Description
abort	Ends a configuration session without saving changes to the target configuration.
end	Terminates a session and returns the router to EXEC mode from any configuration mode.

Command	Description
exit	Exits from the current configuration mode to the next higher command mode or logs out of the terminal session.
show configuration (config)	Displays the contents of the target configuration.
show running-config	Displays the current running (active) configuration.

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	<i>line</i>	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

Examples	The following example shows how to add a description to an interface configuration. In this example, the description command names a Management Ethernet interface. <pre>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</pre>

Related Commands

Command	Description
show interfaces	Displays statistics for all interfaces configured on the router or for a specific node.

do

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

do *exec-command*

Syntax Description	<i>exec-command</i>	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

Examples	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 gigabitethernet 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
```

end

To terminate a configuration session and return directly to XR 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

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 **end** command to exit any configuration mode and return directly to XR EXEC 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 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 or 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 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

Examples

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 gigabitethernet 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv4 address 1.1.1.1 255.0.0.0
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#
```

Related Commands

Command	Description
abort	Ends a configuration session without saving changes to the target configuration.
exit	Exits from the current configuration mode to the next higher command mode or logs out of the terminal session.
show configuration (config)	Displays the contents of the target configuration.

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

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 **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

Examples

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 Commands

Command	Description
end	Terminates a session and returns the router to EXEC mode from any configuration mode.

exit

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

When exiting from global or administration configuration mode to XR EXEC 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 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 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

Examples

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 1.1.1.1 255.0.0.0
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 Commands

Command	Description
abort	Ends a configuration session without saving changes to the target configuration.
end	Terminates a session and returns the router to EXEC mode from any configuration mode.

hostname

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

hostname *name*

Syntax Description	<i>name</i> New hostname for the router.

Command Default	The factory-assigned default hostname is “ios.”

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 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, <i>Choosing a Name for Your Computer</i> .

Task ID	Task ID	Operations
	root-lr	read, write

Examples	The following example shows how to change the router hostname:

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

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

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

Examples

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 <i>number-of-reloads</i>	(Optional) Loads the failed configurations from a previous router reload. Valid <i>number-of-reloads</i> 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

Examples

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 Commands

Command	Description
show configuration (config)	Displays the contents of the target configuration.

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

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

Examples

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 <i>command-name</i>	Displays the manual pages for a specific command. The <i>command-name</i> argument must include the complete command name.
feature [<i>feature-name</i>]	Displays all commands available in the feature. Use the man command with the feature keyword to list the available feature names.
keyword <i>keywords</i>	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

Examples

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.

Examples 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 <i>number-of-commits</i>	Rolls back to the configuration that existed before the last number of commits (specified with the <i>number-of-commits</i> argument) were made.
to <i>commit-id</i>	Rolls back to the running configuration that existed before the configuration specified with the <i>commit-id</i> argument.
force	(Optional) Specifies to override any commit blocks.
label <i>label</i>	(Optional) Assigns a text label to this rollback. The <i>label</i> argument must begin with a letter.
comment <i>line</i>	(Optional) Assigns a text line to this rollback. The <i>line</i> 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

Examples**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'.
```

Examples

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 Commands

Command	Description
load rollback changes	Populates the target configuration with the contents of a previous configuration.

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

Examples 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:

```
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.
	<i>device: directory-path</i>	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

Examples 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 Commands

Command	Description
save configuration commit changes	Saves the changes for a commit, or a series of commits, to a file.
save configuration failed	Saves the contents of the failed configuration.
save configuration merge	Saves the changes for a merged configuration to a file.
save rollback changes	Saves rollback changes for a commit ID or a group of commits.

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	<i>device: directory-path</i>	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

Examples	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 Commands

Command	Description
save configuration commit changes	Saves the changes for a commit, or a series of commits, to a file.
save configuration failed	Saves the contents of the failed configuration.
save configuration merge	Saves the changes for a merged configuration to a file.
save rollback changes	Saves rollback changes for a commit ID or a group of commits.

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

<i>commit-id</i>	Specific commit ID.
last <i>number-of-commits</i>	Saves changes made in the most recent <i>number-of-commits</i> .
since <i>commit-id</i>	Saves changes made since (and including) a specific <i>commit-id</i> .
<i>device: directory-path</i>	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

Examples

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 Commands

Command	Description
save configuration	Saves the contents of a configuration to a file.
save configuration changes	Saves the changes of a configuration to a file.
save configuration failed	Saves the contents of the failed configuration.
save configuration merge	Saves the changes for a merged configuration to a file.
save rollback changes	Saves rollback changes for a commit ID or a group of commits.
show configuration history	Displays history of configuration changes.

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 <i>number</i> 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

Examples

The following example saves the failed configuration to disk0:

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

Related Commands

Command	Description
save rollback changes	Saves rollback changes for a commit ID or a group of commits.
show configuration history	Displays history of configuration changes.

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	<i>device : directory-path</i>	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

Examples 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 Commands

Command	Description
save rollback changes	Saves rollback changes for a commit ID or a group of commits.
show configuration history	Displays history of configuration changes.

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	<i>commit-id</i>	Specific commit ID.
	last <i>number-of-commits</i>	Saves the rollback changes for the last <i>n</i> commits
	to <i>commit-id</i>	Saves rollback changes up to a specific <i>commit-id</i> .
	<i>device: directory-path</i>	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

Examples

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 Commands

Command	Description
save configuration	Saves the contents of a configuration to a file.
save configuration commit changes	Saves the changes for a commit, or a series of commits, to a file.
show configuration history	Displays history of configuration changes.

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

Examples

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 Commands

Command	Description
set default-safi	Sets the default SAFI for the current session.
set default-vrf	Sets the default VRF instance for the current session.
show default-afi-safi-vrf	Displays the default AFI, SAFI, and VRF instance for the current session.

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

Examples

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 Commands

Command	Description
set default-afi	Sets the default AFI for the current session.
set default-vrf	Sets the default VRF instance for the current session.
show default-afi-safi-vrf	Displays the default AFI, SAFI, and VRF instance for the current session.

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

<i>name</i>	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

Examples

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 Commands

Command	Description
set default-afi	Sets the default AFI for the current session.
set default-safi	Sets the default SAFI for the current session.
show default-afi-safi-vrf	Displays the default AFI, SAFI, and VRF instance for the current session.

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	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 5.0.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 5.0.0	This command was introduced.
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	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>basic-services</td><td>read</td></tr> </table>	Task ID	Operations	basic-services	read
Task ID	Operations				
basic-services	read				

Examples 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 Commands

Command	Description
alias	Creates a command alias.

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

Examples

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 Commands

Command	Description
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration history	Displays history of configuration changes.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

show configuration changes

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

show configuration changes [diff]

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

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
	basic-services	read

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

```
RP/0/RP0/CPU0:router(config)# show configuration changes diff

Building configuration...
# hostname router
# hostname bla
- logging console
- telnet vrf default ipv4 server disable
- domain ipv4 host xhu-u5
- domain ipv4 host coax-u10
- domain ipv4 host coax-u10.cisco.com
- domain name
- interface Loopback1
- ipv4 address 10.0.0.2 255.255.255.224
```

```
- !
- interface Loopback2
-   description
- !
- interface Loopback5
-   description
- !
- interface Loopback6
-   description
- !
- interface MgmtEth0/0/CPU0/0
-   ipv4 address 10.0.0.1 255.255.255.224
- !
- interface GigabitEthernet0/2/0/0
-   shutdown
- !
- interface GigabitEthernet0/2/0/1
-   shutdown
- !
- interface GigabitEthernet0/2/0/2
-   shutdown
- !
- router static
-   address-family ipv4 unicast
-     0.0.0.0/0 255.255.255.224
- !
- !
end
```

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

Examples

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 Commands

Command	Description
show configuration (config)	Displays the contents of the target configuration.
show configuration history	Displays history of configuration changes.
show configuration running	Displays the contents of the committed configuration.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

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

Examples 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
!
!
```


Because the configuration failed to be removed, it is still displayed in the output from the **show running-configuration** command as expected:

```
RP/0/RP0/CPU0:router# show running-configuration
...
router pim vrf default address-family ipv4
  auto-rp candidate-rp GigabitEthernet0/2/0/3 scope 255 group-list 224/4 interval 10
!
multicast-routing
  address-family ipv4
    interface all enable
!
!
```

Related Commands

Command	Description
show configuration (config)	Displays the contents of the target configuration.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration history	Displays history of configuration changes.
show configuration running	Displays the contents of the committed configuration.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

show configuration history

To display a history of configuration events, use the **show configuration history** command in XR EXEC or 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 <i>number</i>	(Optional) Displays the first x number of events, where x is the <i>number</i> argument.
last <i>number</i>	(Optional) Displays the last x <i>number</i> 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

Examples

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 14: 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 Commands

Command	Description
show configuration (config)	Displays the contents of the target configuration.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration history	Displays history of configuration changes.
show configuration running	Displays the contents of the committed configuration.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

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

Command Default

XR EXEC mode: 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

Examples

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
```

Related Commands

Command	Description
clear configuration inconsistency replica	Resolves configuration inconsistencies on a standby node.

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	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 5.0.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 5.0.0	This command was introduced.
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	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>config-services</td><td>read</td></tr> </table>	Task ID	Operations	config-services	read
Task ID	Operations				
config-services	read				

Examples	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 gigabitethernet0/1/0/1.1
vrrp 1 preempt delay 300
!
interface gigabitethernet0/1/0/1.2
vrrp 1 preempt delay 300
!
interface gigabitethernet0/1/0/1.3
vrrp 1 preempt delay 300
```

Related Commands

Command	Description
show running-config	Displays the current running (active) configuration.

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	<i>config-keyword</i> (Optional) Specific configuration to display.

Command Default	None

Command Modes	XR EXEC System Admin EXEC

Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 3.9.0</td><td>No modification.</td></tr> <tr> <td>Release 5.0.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 3.9.0	No modification.	Release 5.0.0	This command was introduced.
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 configuration running command to display the currently active configuration.

Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>basic-services</td><td>read</td></tr> </table>	Task ID	Operations	basic-services	read
Task ID	Operations				
basic-services	read				

Examples	This example shows the currently running (committed) configuration from administration mode. <pre>RP/0/RP0/CPU0:router(admin)# show configuration running Building configuration... username lab secret 5 \$1\$XNWt\$j8RscNdncKSRoMSnqSpbj/ group root-system ! end</pre>

Related Commands

Command	Description
show configuration (config)	Displays the contents of the target configuration.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration history	Displays history of configuration changes.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

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

Examples

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 15: 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.
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 134](#)
- [set default-safi, on page 136](#)
- [set default-vrf, on page 138](#)

Task ID	Task ID	Operations
	basic-services	read

Examples 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 Commands

Command	Description
set default-afi	Sets the default AFI for the current session.
set default-safi	Sets the default SAFI for the current session.
set default-vrf	Sets the default VRF instance for the current session.

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.
<i>command</i>	(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

Examples

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 community set
fault              Fault related commands
forward-protocol    Controls forwarding of physical and directed IP broadcasts
ftp                Global FTP configuration commands
--More--
```

In this example, the **show running-config** command is used to display the running configuration for Packet-over-SONET/SDH (POS) interface 0/2/0/1:

```
RP/0/RP0/CPU0:router# show running-config interface pos 0/2/0/1

interface POS0/2/0/1
ipv4 address 10.0.0.0 255.0.0.0
```

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 Commands

Command	Description
show configuration (config)	Displays the contents of the target configuration.

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

<i>name</i>	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

Examples

The following example shows how to enter template configuration mode to create a template. In this example, a template named “pre-pos” is defined for the preconfigured Packet-over-SONET/SDH (POS) interface 0/1/0/1. The **end-template** command is used to exit from template configuration mode.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# template pre-pos
RP/0/RP0/CPU0:router(config-TPL)# interface preconfigure pos0/1/0/0
RP/0/RP0/CPU0:router(config-if-pre)# ipv4 address 10.3.32.154 255.0.0.0
RP/0/RP0/CPU0:router(config-if-pre)# end-template
RP/0/RP0/CPU0:router(config)#
```



Note

After configuring a template, you may want to display the contents of the configured template. To display a template configuration, use the **show running-config** command with the **template name** keyword and argument.

The following example shows sample output from the **show running-config** command with the **template name** keyword and argument. In this example, the output displays the contents of a template named “pre-pos.”

```
RP/0/RP0/CPU0:router# show running-config template pre-pos

template pre-pos
  interface preconfigure POS0/1/0/0
    ipv4 address 10.3.32.154 255.0.0.0
  !
end-template
```

Related Commands

Command	Description
apply-template	Applies a template to the target configuration.
end-template	Exits template configuration mode.
show running-config	Displays the current running (active) configuration.



File System Commands on

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](#), [page 170](#)
- [cfs check](#), [page 172](#)
- [copy](#), [page 174](#)
- [delete](#), [page 180](#)
- [dir](#), [page 182](#)
- [format](#), [page 184](#)
- [mkdir](#), [page 190](#)
- [pwd](#), [page 192](#)
- [rmdir](#), [page 194](#)
- [show filesystem](#), [page 196](#)
- [show media](#), [page 198](#)

cd

To change the present working directory, use the **cd** command in XR EXEC mode.

cd *filesystem*:

Syntax Description

<i>filesystem</i> :	(Optional) Location of the new present working directory. Include the file system alias for the <i>filesystem</i> 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

Command History

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

Usage Guidelines

filesystem

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 present working directory is the directory used when EXEC commands that have an optional argument are entered without that argument. Use the **cd** command to define the present working directory. For example, when the **dir** command is entered without specifying the *filesystem* argument, the files in the present working directory are displayed.

Use the **pwd** command to display the present working directory.

Use the **show filesystem** command to display the available storage devices.

Enter the **cd** command without an argument to return the present working directory to disk0:/usr.

Task ID

Task ID	Operations
filesystem	read

Examples

The following example shows how to change the present working directory to the root directory on the hard disk. In this example, the **pwd** command confirms that the present working directory has changed to the root directory on the hard disk.

```
RP/0/RP0/CPU0:router# cd haddisk:
RP/0/RP0/CPU0:router# pwd

haddisk:
```

The following example shows how to change the present working directory to the default file directory by specifying the **cd** command without a location. In this example, the **pwd** command confirms that the present working directory has changed to the default file directory.

```
RP/0/RP0/CPU0:router# cd
RP/0/RP0/CPU0:router# pwd

disk0:/usr
```

Related Commands

Command	Description
dir	Displays a list of files on a file system or in a specific directory.
pwd	Displays the present working directory.
show filesystem	Displays the layout and contents of file systems.

cfs check

To perform a check of the Configuration File System (CFS), use the **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

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 **cfs check** 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.

Task ID	Task ID	Operations
	root-lr	read, write

Examples 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 the **copy** command in EXEC or administration EXEC mode.

copy *source* {**location** *node-id* *destination* **location** {*node-id*| **all**}| **running-config**[**atomic**]}

Syntax Description

<i>source</i>	Filename including the directory path or network location of the file. The possible sources are: <i>directory-path</i> —Directory path of the file from which the file is copied. access-list { ipv4 ipv6 }—Copies an access list (EXEC mode only). bootflash: —Copies from the bootflash: file system. compactflash: —Copies from the compactflash: file system. compactflasha: —Copies from the compactflasha: file system partition. disk0: —Copies from disk0: file system. disk0a: —Copies from disk0a: file system partition. disk1: —Copies from disk1: file system. disk1a: —Copies from disk1a: file system partition. flash: —Copies from the flash: file system. The flash: keyword is an alias for bootflash:. ftp: —Copies from an FTP network server. The syntax is ftp:[[<i>//username</i> [<i>:password</i>]<i>@</i>]<i>location</i>]/<i>directory</i>]/<i>filename</i>. harddisk: —Copies from the hard disk drive file system (if present). harddiska: —Copies from the hard disk partition a. harddiskb: —Copies from the hard disk partition b. nvr: —Copies from the NVRAM file system. prefix-list {ipv4 ipv6}—Copies from a prefix list (EXEC mode only). rcp: —Copies from a remote copy protocol (rcp) network server. The syntax is rcp:[[<i>//username</i><i>@</i>]<i>location</i>]/<i>directory</i>]/<i>filename</i>. running-config —Copies from the current system configuration. tftp: —Copies from a TFTP network server. The syntax is tftp:[[<i>//location</i>]/<i>directory</i>]/<i>filename</i> xml-schema —Copies the XML schema files as a tar ball file (.tar.gz) [EXEC mode only].
<i>destination</i>	Filename including the directory path or network location of the file.
location <i>node-id</i>	Specifies a node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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
System Admin EXEC

Command History	Releases	Modifications
	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.

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 16: Network Protocols Supported by Cisco IOS XR Software](#), on page 176 describes the network protocols supported by Cisco IOS XR software.

Table 16: Network Protocols Supported by Cisco IOS XR Software

Prefix	Name	Description
tftp:	Trivial File Transfer Protocol	<i>TFTP</i> 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	<i>FTP</i> 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

Examples

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#
```

Related Commands

Command	Description
cd	Changes the present working directory.
dir	Displays a list of files on a file system or in a specific directory.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.

delete

To delete files, use the **delete** command in the appropriate mode .

delete [/noprompt] [/ena] *filesystem: filename* **location** {*node-id* | **all**}
delete *filename*

Syntax Description

/noprompt	(Optional) Causes no prompt for confirmation before deleting the specified files.
/ena	(Optional) Deletes all files from and below the current working directory.
<i>filesystem</i> :	(Optional) Location of the file to be deleted. Include the file system alias for the <i>filesystem</i> argument, followed by a colon, and, optionally, the name of a directory.
<i>filename</i>	Filename of the file to be deleted.
location { <i>node-id</i> all }	Deletes a file from a designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation. The all keyword specifies to delete the file from all nodes.

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

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.

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.

Task ID

Task ID	Operations
filesystem	execute

Examples

The following example shows how to delete a file:

```
RP/0/RP0/CPU0:router# delete rbtest
```

```
Delete disk1:/rbtest[confirm]y
```

Related Commands

Command	Description
cd	Changes the present working directory.
dir	Displays a list of files on a file system or in a specific directory.

dir

To display a list of files on a file system or in a specific directory, use the **dir** command in XR EXEC

.

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.
<i>filesystem</i> :	(Optional) Name of the directory containing the files to be displayed. Include the file system alias for the <i>filesystem</i> argument, followed by a colon, and, optionally, the name of a directory.
<i>filename</i>	(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 { <i>node-id</i> all}	(Optional) Specifies the node from which to display a list of files. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation. The all keyword specifies to display files on all nodes.

Command Default

When the **dir** command is entered without keywords or arguments, the contents of the present working directory are displayed.

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.

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.

Task ID

Task ID	Operations
filesystem	execute

Examples

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--
```

Related Commands

Command	Description
cd	Changes the present working directory.
pwd	Displays the present working directory.
show filesystem	Displays the layout and contents of file systems.

format

To format a file system, use the **format** command in EXEC or administration EXEC mode.

format *filesystem*: [**partition** | **unpartition**] [**filesystem** *filesystem-type*] [*monlib-filename*] **location** {*node-id* | **all**} [**spare** *spare-number*] [**force**] [**recover**]

Syntax Description

<i>filesystem</i> :	Name of the file system to format, followed by a colon. Possible values are bootflash: , disk0: , disk0a: , disk1: , disk1a: , harddisk: , harddiska: , harddiskb: .
partition	(Optional) Creates a partition on a filesystem. This option is not available when the bootflash: filesystem is specified.
unpartition	(Optional) Specifies to remove the partitioning on the specified filesystem.
filesystem <i>filesystem-type</i>	Specifies the filesystem type used to format the specified device. Options include fat16, fat32 and qnx4, depending in the device being formatted.
<i>monlib-filename</i>	(Optional) Name of the ROM monitor library (monlib) file to use for formatting the file system. The default monlib file is the one bundled with the system software. Note The monlib is used by ROMMON for accessing the file system on the media. This option is available on the bootflash: only.
location { <i>node-id</i> all }	(Optional) Specifies the node where the file system is located. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation. Use the all keyword to indicate all nodes.
spare <i>spare-number</i>	(Optional) Reserves spare sectors as specified by the <i>spare-number</i> argument when formatting flash memory. Valid values are from 0 to 16. Note This option is available on the bootflash: only.
force	(Optional) Forces a monlib update, without verifying the monlib version on the device.
recover	(Optional) Recovers any sector read errors on a flash disk.

Command Default

The default monlib file is the one included with the Cisco IOS XR software.

spare-number : 0

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.8.2	• The ability to format a standby bootdisk was introduced. • The unpartition keyword was supported. • The ability to specify the file system type was supported.
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 you can use a new flash memory card, you must format it.

**Caution**

Formatting a storage device deletes all data on that device.

Use the online help (?) function to display the file systems available to be formatted on the router and the formatting options available for a file system.

You cannot format an active boot disk. However, you can format the standby boot disk. Verify that the boot disk you want to format is on the standby , then use the **format** command.

Disk0: and disk1: can be partitioned into two partitions each: disk0: and disk0a:, disk1: and disk1a:. The harddisk: can be partitioned into three partitions: harddisk:, harddiska:, and harddiskb:. The primary partitions are used to store critical data. The secondary partitions are used to store noncritical data.

[Table 17: Size of Disk Partitions in Relation to Size of Disk](#), on page 185 shows the size of the partitions if you partition disk0: :

Table 17: Size of Disk Partitions in Relation to Size of Disk

Size of Disk	Primary Partition Percentage	Secondary Partition Percentage
less than 900 MB	Partitioning not supported	Partitioning not supported
900 MB to 1.5 GB	80%	20%
1.5 GB to 3 GB	60%	40%
more than 3 GB	50%	50%

Task ID

Task ID	Operations
root-lr (EXEC)	execute
root-system (administration EXEC)	execute

Examples

The following example shows how to format disk1:

```
RP/0/RP0/CPU0:router# format disk1:
```

The following example shows how to format disk1: with instructions to recover any sectors on the device that have read errors:

```
RP/0/RP0/CPU0:router# format disk1: recover
```

```
This format operation will try to recover sectors with read error
This operation may take a while. Continue? [confirm]
Format will destroy all data on "disk1:". Continue? [confirm]
```

**Note**

When the console returns to the EXEC prompt, the new flash disk has been formatted and is ready for use.

The following example shows how to format a standby bootdisk.

```
RP/0/RP0/CPU0:router# format disk0: unpartition filesystem fat32 location
Thu May 28 10:22:08.770 UTC
```

```
This operation will destroy all data on "disk0:" and partition device. Continue? [confirm]
```

```
Warning: "disk0:" - partition is boot device on standby node - format operation on this
device will restart the node and package will be re-synchronized.
```

```
Force the format operation on "disk0:" Continue? [confirm]
```

```
Info: "disk0:" - node is restarting to complete format operation.
RP/0/1/CPU0:May 28 10:22:12.148 : mediasvr[67]: %MEDIA-MEDIASVR-6-BOOT_DEVICE_FORMAT_REQUESTED
: Media storage boot device /disk0: was requested to format. Node will reload and device
will be formatted while next boot.
```

```
router con0/RP1/CPU0 is in standby
```

```
I'm sby/non-dlrsc
I'm sby/non-dlrsc
writing 'MEDIA_FORMAT=disk0:,fat32,partition' to nvram
rebooting
```

```
Initializing DDR SDRAM...found 4096 MB
Initializing ECC on bank 0
Initializing ECC on bank 1
Initializing ECC on bank 2
```

```
Initializing DDR SDRAM...found 4096 MB
Initializing ECC on bank 0
Initializing ECC on bank 1
Initializing ECC on bank 2
Initializing ECC on bank 3
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
PCI0 device[1]: Device ID 0x300e
PCI1 device[1]: Device ID 0x1100
PCI1 device[1]: Vendor ID 0x1013
PCI1 device[2]: Device ID 0x680
PCI1 device[2]: Vendor ID 0x1095
PCI1 device[3]: Device ID 0x5618
PCI1 device[3]: Vendor ID 0x14e4
Configuring MPPs ...
Configuring PCMCIA slots ...

System Bootstrap, Version 1.52(20081016:231824) [CRS-1 ROMMON],
Copyright (c) 1994-2008 by Cisco Systems, Inc.

Acquiring backplane mastership .....failed

Board type is 0x100002 (1048578)

Switch 0 initialized
Switch 0 Port fe0: link up (100Mb Full Duplex Copper)
Switch 0 Port fe1: link up (100Mb Full Duplex Copper)
Backplane FE port Up... Enabling
Enabling watchdog
G4(7457-NonSMP-MV64360 Rev 4) platform with 4096 MB of main memory

..
..
Acquiring backplane mastership....failed.
Unable to access backplane ... invoking READ EEPROM protocol

Enabling only inter-RP port... successful

Sending backplane ID EEPROM read request
  using Control Plane Ethernet.
DEBUG : Driving up signal strength for Intel LXT971
Our MAC address is 0249.4450.0008
Interface link changed state to UP.

Sending ID EEPROM read request.
HIT CTRL-C to abort

ID EEPROM read request successful.
Reconfiguring switches with default config ...
Chassis type: 484

    CARD_RACK_NUMBER: 0
    CARD_SLOT_NUMBER: 1
    CPU_INSTANCE: 1
    RACK_SERIAL_NUMBER: TBA10490038
MBI Validation starts ... using Control Plane Ethernet.
DEBUG : Driving up signal strength for Intel LXT971
Our MAC address is 0011.93ef.f4da
Interface link changed state to UP.
Interface link state up.

MBI validation sending request.
HIT CTRL-C to abort

MBI validation sending request.
HIT CTRL-C to abort

mbi_val_process_packet: received response.
RACK_NUM = 0, RACK_TYPE=0
Local image to boot : bootflash:disk0/hfr-os-mbi-3.9.0.08I/mbihfr-rp.vm
boot: booting from bootflash:disk0/hfr-os-mbi-3.9.0.08I/mbihfr-rp.vm
..

```

```

.....
#####
tracelogger: starting tracing in background ring mode
tracelogger running with args: -startring -F 1 -F 2
      Restricted Rights Legend

```

Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c) of the Commercial Computer Software - Restricted Rights clause at FAR sec. 52.227-19 and subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS sec. 252.227-7013.

cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706

```

Cisco IOS XR Software for the Cisco XR HFR, Version 3.9.0.08I
Copyright (c) 2009 by Cisco Systems, Inc.
writing 'MEDIA_FORMAT=' to nvram
Format requested 'disk0:' / partition option 'FAT32'
ostype=4
cp: Can't open source file. ()
Media storage device /disk0: was formatted due to request. Check fsck log at
/dev/disk0:/chkfs_failure.log
May 27 21:55:45.578 : Install (Node Preparation): Install device root is /disk0/
May 27 21:55:45.585 : Install (Node Preparation): Trying device disk0:
May 27 21:55:46.951 : Install (Node Preparation): Checking size of device disk0:
May 27 21:55:46.964 : Install (Node Preparation): OK
May 27 21:55:46.984 : Install (Node Preparation): Checking free space on disk0:
May 27 21:55:46.996 : Install (Node Preparation): OK
May 27 21:55:46.998 : Install (Node Preparation): Checking free space on MBI device bootflash:
May 27 21:55:47.001 : Install (Node Preparation): OK
May 27 21:55:47.003 : Install (Node Preparation): Starting package and meta-data sync
May 27 21:55:47.014 : Install (Node Preparation): Cleaning packages not in sync list
May 27 21:55:47.017 : Install (Node Preparation): Please wait...
May 27 21:55:47.020 : Install (Node Preparation): Complete
May 27 21:55:47.033 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/flash-util-0.0.175
May 27 21:55:47.036 : Install (Node Preparation): Please wait...
May 27 21:55:49.124 : Install (Node Preparation): Completed syncing:
/disk0/flash-util-0.0.175
May 27 21:55:49.128 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/infra-mediasvr-0.0.174
May 27 21:55:49.131 : Install (Node Preparation): Please wait...
May 27 21:55:51.609 : Install (Node Preparation): Completed syncing:
/disk0/infra-mediasvr-0.0.174
May 27 21:55:51.612 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/hfr-os-mpi-3.9.0.08I
May 27 21:55:51.615 : Install (Node Preparation): Please wait...
May 27 21:57:19.559 : Install (Node Preparation): Completed syncing:
/disk0/hfr-os-mpi-3.9.0.08I
May 27 21:57:19.562 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/hfr-base-3.9.0.08I
May 27 21:57:19.565 : Install (Node Preparation): Please wait...
May 27 22:08:34.656 : Install (Node Preparation): Completed syncing:
/disk0/hfr-base-3.9.0.08I
May 27 22:08:34.664 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/hfr-admin-3.9.0.08I
May 27 22:08:34.667 : Install (Node Preparation): Please wait...
May 27 22:11:27.134 : Install (Node Preparation): Completed syncing:
/disk0/hfr-admin-3.9.0.08I
May 27 22:11:27.137 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/hfr-fwdg-3.9.0.08I
May 27 22:11:27.140 : Install (Node Preparation): Please wait...
May 27 22:14:02.809 : Install (Node Preparation): Completed syncing:
/disk0/hfr-fwdg-3.9.0.08I
May 27 22:14:02.812 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/hfr-lc-3.9.0.08I
May 27 22:14:02.815 : Install (Node Preparation): Please wait...
May 27 22:17:04.512 : Install (Node Preparation): Completed syncing:
/disk0/hfr-lc-3.9.0.08I
May 27 22:17:04.515 : Install (Node Preparation): Syncing package/meta-data contents:

```



```

/disk0/hfr-rout-3.9.0.08I
May 27 22:17:04.518 : Install (Node Preparation): Please wait...
May 27 22:20:18.976 : Install (Node Preparation): Completed syncing:
/disk0/hfr-rout-3.9.0.08I
May 27 22:20:18.979 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/instdb/ldpath
May 27 22:20:18.982 : Install (Node Preparation): Please wait...
May 27 22:20:19.143 : Install (Node Preparation): Completed syncing: /disk0/instdb/ldpath
May 27 22:20:19.152 : Install (Node Preparation): Syncing package/meta-data contents:
/disk0/instdb/ldpath.committed
May 27 22:20:19.156 : Install (Node Preparation): Please wait...
May 27 22:20:19.392 : Install (Node Preparation): Completed syncing:
/disk0/instdb/ldpath.committed
May 27 22:20:19.395 : Install (Node Preparation): Completed sync of all packages and
meta-data.
May 27 22:20:19.398 : Install (Node Preparation): Starting MBI sync
May 27 22:20:19.400 : Install (Node Preparation): Please wait...
May 27 22:20:37.631 : Install (Node Preparation): Completed sync of MBIs
Media storage device /harddisk: is formatted as FAT32 when software expects it to be formatted
as QNX4. Please use device file system upgrade procedure to fix.

router con0/1/CPU0 is in standby

```

The following example shows how to format a disk with the FAT32 file system:

```

RP/0/RP0/CPU0:router# format disk1: partition filesystem fat32 force
Thu May 28 22:00:48.821 UTC

```

```

This operation will destroy all data on "disk1:" and partition device. Continue? [confirm]
RP/0/RP0/CPU0:May 28 22:00:53.520 : syslog_dev[83]: mkdosfs:
RP/0/RP0/CPU0:May 28 22:00:53.520 : syslog_dev[83]: mkdosfs: Format complete: FAT16 (4096-byte
clusters), 100180 kB available.
RP/0/RP0/CPU0:May 28 22:00:55.640 : syslog_dev[83]: mkdosfs:
RP/0/RP0/CPU0:May 28 22:00:55.640 : syslog_dev[83]: mkdosfs: Format complete: FAT32 (4096-byte
clusters), 898800 kB available.

```

Device partition disk1: is now formatted and is available for use.

```

RP/0/RP0/CPU0:router# show media

```

```

Thu May 28 22:00:57.958 UTC

```

Media Information for 0/RP0/CPU0.

Mountpoint	Image FsType	Current FsType	State	DrvrPid	Mirror	Flags
/disk0:	FAT16	FAT16	Mounted	0032796		
/disk0a:	FAT16	(?)	Not Present			
/disk1:	FAT16	FAT32	Mounted	0032801	Enabled	Formatted
/disk1a:	FAT16	FAT16	Mounted	0032801		Formatted
/harddisk:	QNX4	FAT32	Mounted	0057384		
/harddiska:	QNX4	(?)	Not Present			
/harddiskb:	FAT32	(?)	Not Present			

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

<i>filesystem</i> :	File system on which to create a new directory.
location { <i>node-id</i> all }	(Optional) Specifies the node where the file system is located. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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 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.

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.

Task ID

Task ID	Operations
filesystem	execute

Examples

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)
```

Related Commands

Command	Description
dir	Displays a list of files on a file system or in a specific directory.
rmdir	Removes an existing directory.

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 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 **pwd** command to show what directory or file system is specified as the default by the **cd** command.

Task ID

Task ID	Operations
filesystem	read

Examples

The following example shows how to display the present working directory:

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

```
disk0:/usr
```

Related Commands

Command	Description
cd	Changes the present working directory.
dir	Displays a list of files on a file system or in a specific directory.

rmdir

To remove an existing directory, use the **rmdir** command in the appropriate mode.

rmdir *filesystem*: **location** {*node-id* | **all**}

Syntax Description

<i>filesystem</i>	Name of the file system from which to delete a directory, followed by a colon.
location { <i>node-id</i> all }	Specifies the node where the file system is located. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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 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 **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.

Task ID

Task ID	Operations
filesystem	execute

Examples

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)
```

Related Commands

Command	Description
delete	Deletes files.
dir	Displays a list of files on a file system or in a specific directory.
mkdir	Creates a new directory on a file system.

show filesystem

To display the layout and contents of file systems, use the **show filesystem** command in System Admin EXEC

XR EXEC

.

show filesystem *filesystem*:[**firmware**|**stats**|**verbose level**] [**location** {*node-id*|**all**}]

Syntax Description

<i>filesystem</i> :	Name of the file system for which to display information, followed by a colon. Possible values are: disk0: , disk1: , harddisk: .
firmware	(Optional) Displays the firmware level.
stats	(Optional) Displays device statistics.
verbose level	(Optional) Changes the device driver verbose level.
location { <i>node-id</i> all }	(Optional) Specifies the node where the file system is located. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation. Use the all keyword to indicate all nodes.

Command Default

The file system for the active RP is displayed.

Command Modes

XR EXEC

System Admin 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 filesystem** command to learn the alias names (prefixes) of the file systems supported by your networking device.

Task ID

Task ID	Operations
basic-services	read

Examples

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	nvrn	rw	nvrn:
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	nvrn	rw	nvrn:
1024606208	847888384	flash-disk	rw	disk0:
62390272	62153616	flash	rw	bootflash:

Table 18: 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

Syntax Description This command has no keywords or arguments.

Command Default The disk storage media for the active RP is displayed.

Command Modes System Admin EXEC

Command History

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

Usage Guidelines Use the **show media** command to view the status of the storage media on your system.

Examples The following example displays the output of the **show media** command:

```

sysadmin-vm:0_RP0#show media
Partition      Size      Used    Percent   Avail
rootfs:        2.0G      471M    26%       1.4G
log:           494M      84M     18%       385M
config:        494M      24M      5%       445M
disk0:         965M      31M      4%       886M
harddisk:      20G      185M     1%       19G
-----
rootfs: = root file system (read-only)
log:    = system log files (read-only)
config: = configuration storage (read-only)

```

Table 19: show media Field Descriptions

Field	Description
Partition	Partition on the disk.
Size	Size of the partition.
Used	Partition size used.

Field	Description
Percent	Percentage used.
Avail	Available free partition space.



Hardware Redundancy and Node Administration Commands on

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.

- [fpd auto-upgrade, page 203](#)
- [hw-module profile feature, page 205](#)
- [hw-module subslot shutdown, page 207](#)
- [led mode, page 209](#)
- [redundancy switchover, page 211](#)
- [show environment, page 213](#)
- [show fpd package, page 217](#)
- [show hw-module fpd, page 221](#)
- [show hw-module profile, page 224](#)
- [show hw-module subslot brief, page 226](#)
- [show hw-module subslot config, page 229](#)
- [show hw-module subslot counters, page 232](#)
- [show hw-module subslot errors, page 235](#)
- [show hw-module subslot plim-subblock, page 238](#)
- [show hw-module subslot registers, page 240](#)
- [show hw-module subslot status, page 243](#)
- [show inventory, page 246](#)
- [show led, page 249](#)
- [show operational, page 251](#)
- [show redundancy, page 254](#)
- [show version, page 256](#)

- [upgrade hw-module fpd, page 258](#)

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

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.

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.pie disk0: hfr-mpls-p.pie
```

Task ID	Task ID	Operation
	system	read, write

Examples The following example shows how to enable automatic FPD upgrades:

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

Related Commands

Command	Description
upgrade hw-module fpd	Manually upgrades the current field-programmable device (FPD) image package on a module.
install add	Adds the contents of an ISO image, package, and SMUs to the software repository.

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
root-lr	read, write

Examples

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 12

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
```

Related Commands

Command	Description
show hw-module profile	Displays the active profiles.

hw-module subslot shutdown

To administratively shut down a specific shared port adapter (SPA), use the **hw-module subslot shutdown** command in

XR Config

mode. To return a SPA to the up state, use the **no** form of this command.

hw-module subslot *subslot-id* shutdown [powered|unpowered]

no hw-module subslot *subslot-id* shutdown

Syntax Description

<i>subslot-id</i>	Specifies the subslot to be shut down. The <i>subslot-id</i> argument is entered in the <i>rack/slotsubslot</i> notation.
powered	(Optional) Retains power to the specified subslot.
unpowered	(Optional) Powers down completely the specified subslot.

Command Default

Shutdown is powered if no option is specified.

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.

This command administratively shuts down the SPA in the specified subslot. Subslots that are shut down still have power but cannot load or operate Cisco IOS XR software.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to shut down the SPA in subslot 1 of the SPA interface processor (SIP) in slot 2:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# hw-module subslot 0/2/1 shutdown powered
```

Related Commands

Command	Description
shutdown (global)	Disables an interface (forces an interface to be administratively down).

led mode

To change the message, mode or status of a router card LED display, use the **led mode** command in administration configuration mode. To revert to the default message, mode or status, use the **no** form of this command.

led mode {**default**| **scroll**} {**lock**| **unlock**} *message* **location** *node-id*

Syntax Description

{ default scroll }	Specifies the mode of the card LED display.
{ lock unlock }	Specifies the status of the card LED display.
<i>message</i>	Specifies the message to display on the card LED.
location <i>node-id</i>	Specifies the node for which to configure the LED information. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation.

Command Default

Mode: default; status: unlocked; message: according to the state of the software

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

You must be in a user group associated with a task group that includes the proper task IDs. The command reference guides include the task IDs required for each command. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show led** command to display the LED settings for a card or all cards.

Task ID

Task ID	Operation
system	read, write

Examples

This example shows how to change the message displayed on the card LED and the subsequent display in the **show led** command output:

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

```
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# led mode default unlock STBY_RP location 0/rp0/cpu0
RP/0/RP0/CPU0:router(admin-config)# end
```

Uncommitted changes found, commit them? [yes]:

```
RP/0/RP0/CPU0:router(admin)# show led location all | i 0/RP0/CPU0
```

LOCATION	MESSAGE	MODE	STATUS
0/0/SP	IOX-RUN	DEFAULT	UNLOCKED
0/1/SP	IOX-RUN	DEFAULT	UNLOCKED
0/RP0/CPU0	STBY_RP	DEFAULT	UNLOCKED
0/RP1/CPU0	ACTV_RP	DEFAULT	UNLOCKED

Related Commands

Command	Description
show led	Displays LED information for the router, or for a specific LED location.

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 <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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

Examples

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.
```

Related Commands

Command	Description
show redundancy	Displays the status of route processor redundancy.

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 <i>node-id</i> }	(Optional) Displays all environmental monitor parameters for the specified location only.
power	(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.
<i>node-id</i>	(Optional) Node whose information you want to display. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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

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 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

Examples

The following example shows sample output from the **show environment** command with the **temperatures** keyword:

```
RP/0/RP0/CPU0:router # show environment 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 20: [show environment temperatures Field Descriptions](#), on page 215 describes the significant fields shown in the display.

Table 20: show environment temperatures Field Descriptions

Field	Description
R/S/I	Rack number, slot number, and interface for which information is displayed, in the format <i>rack/slot</i> .
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.
Hotspot Temperature (deg C)	Current temperature of the hotspot, in degrees Celsius.

Table 21: [show environment leds Field Descriptions](#), on page 215 describes the significant fields shown in the display.

Table 21: show environment leds Field Descriptions

Field	Description
<i>rack_num/slot_num/*</i> :	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 22: 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.
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.

show fpd package

To display which shared port adapters (SPA) and SPA interface processors (SIPs) are supported with your current Cisco IOS XR software release, which field-programmable device (FPD) image you need for each SPA and SIP, and what the minimum hardware requirements are for the SPA and SIP modules, use the **show fpd package** command in administration EXEC mode.

show fpd package

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 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.

If there are multiple FPD images for your card, use the **show fpd package** command to determine which FPD image to use if you only want to upgrade a specific FPD type.

Task ID	Task ID	Operations
	sysmgr	read

Examples The following example shows sample output from the **show fpd package** command:

```

sysadmin_vm:0 RP1 # show fpd package
PROTO-CXP-2XPITA   BAO-MB FPGA           NO      1.00      1.00      0.0
                   Slice-0 GN2411        YES      3.01      3.01      2.0
                   Slice-1 GN2411        YES      3.01      3.01      2.0
                   Slice-0 GN2411        YES      2.07      2.07      0.0
                   Slice-1 GN2411        YES      2.07      2.07      0.0
                   CCC FPGA              YES      1.14      1.14      0.0
                   CCC Power-On          YES      1.30      1.30      0.0
                   Ethernet Switch       YES      1.32      1.32      0.0
                   BIOS FPD              YES      9.10      9.10      0.0

```

show fpd package

	SB Certificates	NO	1.00	1.00	0.0
NC6-FANTRAY	Fantray FPGA	NO	2.01	2.01	0.0
PWR-3KW-AC-V2	DT-PrimCU	NO	6.01	6.01	1.0
	DT-Sec54vMCU	NO	6.01	6.01	1.0
	DT-Sec5vMCU	NO	6.03	6.03	1.0
	EM-Sec54vMCU	NO	3.08	3.08	0.21
	EM-Sec5vMCU	NO	3.06	3.06	0.21
PWR-2KW-DC-V2	DT-PrimCU	NO	6.02	6.02	0.12
	DT-Sec54vMCU	NO	6.02	6.02	0.12
	DT-Sec5vMCU	NO	6.02	6.02	0.12
	EM-PrimCU	NO	3.06	3.06	0.21
	EM-Sec54vMCU	NO	3.09	3.09	0.21
	EM-Sec5vMCU	NO	3.07	3.07	0.21
NC6-10X100G-L-K	BAO-MB FPGA	NO	1.00	1.00	0.0
	BAO-DB FPGA	NO	1.00	1.00	0.0
	S2 GN2411	YES	3.01	3.01	2.0
	S3 GN2411	YES	3.01	3.01	2.0
	S4 GN2411	YES	3.01	3.01	2.0
	S2 GN2411	YES	2.07	2.07	0.0
	S3 GN2411	YES	2.07	2.07	0.0
	S4 GN2411	YES	2.07	2.07	0.0
	CCC FPGA	YES	1.14	1.14	0.0
	CCC Power-On	YES	1.30	1.30	0.0
	Ethernet Switch	YES	1.32	1.32	0.0
	BIOS FPD	YES	9.10	9.10	0.0
	SB Certificates	NO	1.00	1.00	0.0
NC6-10X100G-M-K	BAO-MB FPGA	NO	1.00	1.00	0.0
	BAO-DB FPGA	NO	1.00	1.00	0.0
	S2 GN2411	YES	3.01	3.01	2.0
	S3 GN2411	YES	3.01	3.01	2.0
	S4 GN2411	YES	3.01	3.01	2.0
	S2 GN2411	YES	2.07	2.07	0.0
	S3 GN2411	YES	2.07	2.07	0.0
	S4 GN2411	YES	2.07	2.07	0.0
	CPAK bay 0 FPD	YES	1.13	1.13	0.0
	CPAK bay 1 FPD	YES	1.13	1.13	0.0
	CPAK bay 2 FPD	YES	1.13	1.13	0.0
	CPAK bay 3 FPD	YES	1.13	1.13	0.0
	CPAK bay 4 FPD	YES	1.13	1.13	0.0
	CPAK bay 5 FPD	YES	1.13	1.13	0.0
	CPAK bay 6 FPD	YES	1.13	1.13	0.0
	CPAK bay 7 FPD	YES	1.13	1.13	0.0
	CPAK bay 8 FPD	YES	1.13	1.13	0.0
	CPAK bay 9 FPD	YES	1.13	1.13	0.0
	CCC FPGA	YES	1.14	1.14	0.0
	CCC Power-On	YES	1.30	1.30	0.0
	Ethernet Switch	YES	1.32	1.32	0.0
	SB Certificates	NO	1.00	1.00	0.0
NC6-10X100G-L-P	BAO-MB FPGA	NO	1.00	1.00	0.0
	BAO-DB FPGA	NO	1.00	1.00	0.0
	Slice-0 GN2411	YES	3.01	3.01	2.0
	Slice-1 GN2411	YES	3.01	3.01	2.0
	Slice-0 GN2411	YES	2.07	2.07	0.0
	Slice-1 GN2411	YES	2.07	2.07	0.0
	Slice-2 GN2411	YES	3.01	3.01	2.0
	Slice-3 GN2411	YES	3.01	3.01	2.0
	Slice-4 GN2411	YES	3.01	3.01	2.0
	Slice-2 GN2411	YES	2.07	2.07	0.0
	Slice-3 GN2411	YES	2.07	2.07	0.0
	Slice-4 GN2411	YES	2.07	2.07	0.0
	S2 GN2411	YES	3.01	3.01	2.0
	S3 GN2411	YES	3.01	3.01	2.0
	S4 GN2411	YES	3.01	3.01	2.0
	S2 GN2411	YES	2.07	2.07	0.0
	S3 GN2411	YES	2.07	2.07	0.0
	S4 GN2411	YES	2.07	2.07	0.0
	CCC FPGA	YES	1.14	1.14	0.0

	CCC Power-On	YES	1.30	1.30	0.0
	Ethernet Switch	YES	1.32	1.32	0.0
	BIOS FPD	YES	9.10	9.10	0.0
	SB Certificates	NO	1.00	1.00	0.0

NC6-6-10X100G-L-K	BAO-MB FPGA	NO	1.00	1.00	0.0
	BAO-DB FPGA	NO	1.00	1.00	0.0
	Slice-0 GN2411	YES	2.07	2.07	0.0
	Slice-1 GN2411	YES	2.07	2.07	0.0
	Slice-2 GN2411	YES	2.07	2.07	0.0
	Slice-3 GN2411	YES	2.07	2.07	0.0
	Slice-4 GN2411	YES	2.07	2.07	0.0
	S2 GN2411	YES	2.07	2.07	0.0
	S3 GN2411	YES	2.07	2.07	0.0
	S4 GN2411	YES	2.07	2.07	0.0
	CCC FPGA	YES	1.14	1.14	0.0
	CCC Power-On	YES	1.30	1.30	0.0

This table describes the significant fields shown in the display:

Table 23: show fpd package Field Descriptions

Field	Description
Card Type	Module part number.
FPD Description	Description of all FPD images available for the SPA.
Type	Hardware type. Possible types can be: • spa—Shared port adapter • lc—Line card
Subtype	FPD subtype. These values are used in the upgrade hw-module fpd command to indicate a specific FPD image type to upgrade.
SW Version	FPD software version recommended for the associated module running the current Cisco IOS XR software.
Min Req SW Vers	Minimum required FPD image software version to operate the card. Version 0.0 indicates that a minimum required image was not programmed into the card.
Min Req HW Vers	Minimum required hardware version for the associated FPD image. A minimum hardware requirement of version 0.0 indicates that all hardware can support this FPD image version.

Related Commands

Command	Description
show hw-module fpd	Displays field-programmable device (FPD) compatibility for all modules or a specific module.
upgrade hw-module fpd	Manually upgrades the current field-programmable device (FPD) image package on a module.

show hw-module fpd

To display field-programmable device (FPD) compatibility for all modules or a specific module, use the **show hw-module fpd** command in the EXEC or administration EXE mode.

show hw-module fpd location {*node-id*| **all**}

Syntax Description

location { <i>node-id</i> all }	Specifies the location of the module. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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 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
root-lr	read

Examples

The following example shows how to display FPD compatibility for all modules in the router:

```
RP/0/RP0/CPU0:router# show hw-module fpd location all
```

```
===== Existing Field Programmable Devices =====
Location      Card Type      HW Version Type Subtype Inst Current SW Upg/
=====      =====      =====
0/1/CPU0      CRS1-SIP-800    0.96  lc   fpga   0       2.0    No
```

0/1/0	SPA-4XOC3-POS	1.0	spa	fpga	0	3.4	No
0/1/5	SPA-8X1GE	2.2	spa	fpga	5	1.8	No
0/6/CPU0	CRS1-SIP-800	0.96	lc	fpga	0	2.0	No
0/6/0	SPA-4XOC3-POS	1.0	spa	fpga	0	3.4	No
0/6/4	SPA-8XOC3-OC12-POS	1.1	spa	fpga	4	0.5	Yes
0/6/5	SPA-8X1GE	2.2	spa	fpga	5	1.8	No

NOTES:

- One or more FPD needs an upgrade or a downgrade. This can be accomplished using the "admin upgrade hw-module fpd" CLI.

Table 24: show hw-module fpd Field Descriptions

Field	Description
Location	Location of the module in the <i>rack/slot/module</i> notation.
Card Type	Module part number.
HW Version	Hardware model version for the module.
Type	Hardware type. Can be one of the following types: • spa—Shared port adapter • lc—Line card
Subtype	FPD type. Can be one of the following types: • fabldr—Fabric downloader • fpga1—Field-programmable gate array • fpga2—Field-programmable gate array 2 • fpga3—Field-programmable gate array 3 • fpga4—Field-programmable gate array 4 • fpga5—Field-programmable gate array 5 • rommonA—Read-only memory monitor A • rommon—Read-only memory monitor B
Inst	FPD instance. The FPD instance uniquely identifies an FPD and is used by the FPD process to register an FPD.
Current SW Version	Currently running FPD image version.

Field	Description
Upg/Dng?	Specifies whether an FPD upgrade or downgrade is required. A downgrade is required in rare cases when the version of the FPD image has a higher major revision than the version of the FPD image in the current Cisco IOS XR software package.

Related Commands

Command	Description
show fpd package	Displays which SPAs and SIPs are supported with your current Cisco IOS XR software release, which FPD image you need for each card, and what the minimum hardware requirements are for the various modules.
upgrade hw-module fpd	Manually upgrades the current field-programmable device (FPD) image package on a module.

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 <i>node-id</i>	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

Examples

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 205	Enables a feature bundle on the router.

Related Commands

Command	Description
hw-module profile feature	Enables a feature bundle on the router.

show hw-module subslot brief

To display summary information related to a specified internal hardware device on a shared port adapter (SPA), use the **show hw-module subslot brief** command in XR EXEC mode.

show hw-module subslot [*node-id*] **brief** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • analog-digital-converter—Displays analog-to-digital converter information. • c2w—Displays Cisco-to-wire bus device information. • fpga—Displays SPA field-programmable gate array information. • framer—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • hdlc—Displays SPA hdlc information, where applicable. • l2-tcam—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • mac—Displays SPA MAC information. (Not applicable to POS SPAs.) • pluggable-optics—Displays pluggable-optics module information. • power-margining—Displays power-margining device information. • sar—Displays SPA ATM SAR information. • sdcc—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • serdes—Displays SPA serializer/deserializer information. • spi4—Displays system packet interface level 4.2 bus device information. • temperature-sensor—Displays temperature sensor information.
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

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.

You can also enter a partially qualified location specifier by using the wildcard (*) character. For example, 0/1/* would display information for all modules on slot 1 in rack 0.

Use the **show hw-module subslot brief** command to obtain summary diagnostic information about a device on an interface on the SPA.

Task ID	Task ID	Operations
	root-lr	read

Examples The following example shows sample output for the **show hw-module subslot brief** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/0 brief

Subslot 0/1/0 brief info:
-----
SPA inserted: YES
SPA type:      4xOC3 POS SPA
SPA operational state: READY
SPA cfg admin up: YES
```

Table 25: show hw-module subslot config Field Descriptions

Field	Description
SPA inserted	Indicates if a SPA is currently detected in the subslot.
SPA type	Description of SPA including the technology type, number of ports, height of SPA (HHSPA—single height, FHSPA—double height), and optics type.
SPA operational state	Current state of the SPA module.
SPA cfg admin up	Configured state of the SPA: YES—the SPA is not shut down; NO—the SPA is shut down.

 `show hw-module subslot brief`

show hw-module subslot config

To display information related to configuration of the specified internal hardware device on a shared port adapter (SPA), use the **show hw-module subslot config** command in XR EXEC mode.

show hw-module subslot [*node-id*] **config** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • analog-digital-converter—Displays analog-to-digital converter information. • c2w—Displays Cisco-to-wire bus device information. • fpga—Displays SPA field-programmable gate array information. • framer—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • hdlc—Displays SPA hdlc information, where applicable. • l2-tcam—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • mac—Displays SPA MAC information. (Not applicable to POS SPAs.) • pluggable-optics—Displays pluggable-optics module information. • power-margining—Displays power-margining device information. • sar—Displays SPA ATM SAR information. • sdcc—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • serdes—Displays SPA serializer/deserializer information. • spi4—Displays system packet interface level 4.2 bus device information. • temperature-sensor—Displays temperature sensor information.
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

Command Default

No default behavior or values

Command Modes

Release 5.0.0

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 can also enter a partially qualified location specifier by using the wildcard (*) character. For example, 0/1/* would display information for all modules on slot 1 in rack 0.

Use the **show hw-module subslot config** command to obtain diagnostic information about the configuration of an interface on the SPA.

Task ID

Task ID	Operations
root-lr	read

Examples

The following example shows sample output for the **show hw-module subslot config** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/6/cpu0 config
Thu Feb 19 00:33:02.921 PST
Subslot 0/6/0 config info:
-----
SPA inserted: YES
SPA cfg admin up: YES
SPA cfg power up: YES
Subslot 0/6/1 config info:
-----
SPA inserted: YES
SPA cfg admin up: YES
SPA cfg power up: YES
Subslot 0/6/2 config info:
-----
SPA inserted: NO
SPA cfg admin up: YES
SPA cfg power up: NO
Subslot 0/6/3 config info:
-----
SPA inserted: NO
SPA cfg admin up: YES
SPA cfg power up: NO
Subslot 0/6/4 config info:
-----
SPA inserted: NO
```

```
SPA cfg admin up: YES
SPA cfg power up: NO

Subslot 0/6/5 config info:
-----
SPA inserted: NO
SPA cfg admin up: YES
SPA cfg power up: NO
```

Table 26: show hw-module subslot config Field Descriptions

Field	Description
SPA inserted	Indicates if a SPA is currently detected in the subslot.
SPA cfg admin up	Configured state of the SPA: YES—the SPA is not shut down; NO—the SPA is shut down.
SPA cfg power up	Indicates whether the subslot is currently configured as powered or not.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show hw-module subslot counters

To display statistics related to the processing of internal hardware devices for a shared port adapter (SPA), use the **show hw-module subslot counters** command in

XR EXEC

mode.

show hw-module subslot [*node-id*] **counters** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • analog-digital-converter—Displays analog-to-digital converter information. • c2w—Displays Cisco-to-wire bus device information. • fpga—Displays SPA field-programmable gate array information. • framer—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • hdlc—Displays SPA hdlc information, where applicable. • l2-tcam—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • mac—Displays SPA MAC information. (Not applicable to POS SPAs.) • pluggable-optics—Displays pluggable-optics module information. • power-margining—Displays power-margining device information. • sar—Displays SPA ATM SAR information. • sdcc—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • serdes—Displays SPA serializer/deserializer information. • spi4—Displays system packet interface level 4.2 bus device information. • temperature-sensor—Displays temperature sensor information.
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

Command Default

No default behavior or values

Command Modes XR EXEC

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 can also enter a partially qualified location specifier by using the wildcard (*) character. For example, 0/1/* would display information for all modules on slot 1 in rack 0.

Use the **show hw-module subslot counters** command to display statistics related to the processing by the specified internal hardware device.

Task ID	Operations
root-lr	read

Examples The following example shows sample output for the **show hw-module subslot counters** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/cpu0 counters

Subslot 0/1/0 counts info:
-----
SPA inserted: YES
SPA type:      8xGE SPA
SPA operational state: READY
SPA insertion time: Wed Jan 14 11:33:24 2009
SPA last time ready: Wed Jan 14 11:33:37 2009
SPA uptime [HH:MM:SS]: 852:54:24

Subslot 0/1/1 counts info:
-----
SPA inserted: YES
SPA type:      5xGE SPA
SPA operational state: READY
SPA insertion time: Wed Jan 14 11:33:24 2009
SPA last time ready: Wed Jan 14 11:33:38 2009
SPA uptime [HH:MM:SS]: 852:54:23
--More--
```

Table 27: show hw-module subslot counters Field Descriptions

Field	Description
SPA inserted	Indicates if a SPA is currently detected in the subslot.

Field	Description
SPA type	Description of SPA including the technology type, number of ports, height of SPA (HHSPA—single height, FHSPA—double height), and optics type.
SPA operational state	Current state of the SPA module.
SPA insertion time	Time the SPA module was last physically inserted or power-cycled.
SPA last time ready	Time the SPA module last changed state to up or ready (the last time the module was loaded or reloaded).
SPA uptime	The time in service or amount of time since the module was last out of service due to a reload, power cycle, or configuration event.

The following example shows sample output for the **show hw-module subslot counters** command with the **framer** keyword:

```
RP/0/RP0/CPU0:router# show hw-module subslot counters framer

SPA device framer index 0 subindex 0 info:

Milan Framer counters:
STREAM 0
Rx Bytes (48-bit) (#0x381fa078-0x883c): 163857232569448
Rx Good Bytes (48-bit) (#0x381fa080-0x8840): 1964924
Rx Good Packets (48-bit) (#0x381fa040-0x8820): 26234
Tx Byte Cnt Reg (48-bit) (#0x381fe070-0xa838): 9375380
Tx Good Bytes Cnt Reg (48-bit) (#0x381fe068-0xa834): 8909442
Tx Transmitted Packet Cnt Reg (48-bit) (#0x381fe040-0xa820): 114692
```

show hw-module subslot errors

To display error information about internal hardware devices for a shared port adapter (SPA), use the **show hw-module subslot errors** command in

XR EXEC

mode.

show hw-module subslot [*node-id*] **errors** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • analog-digital-converter—Displays analog-to-digital converter information. • c2w—Displays Cisco-to-wire bus device information. • fpga—Displays SPA field-programmable gate array information. • framer—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • hdlc—Displays SPA hdlc information, where applicable. • l2-tcam—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • mac—Displays SPA MAC information. (Not applicable to POS SPAs.) • pluggable-optics—Displays pluggable-optics module information. • power-margining—Displays power-margining device information. • sar—Displays SPA ATM SAR information. • sdcc—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • serdes—Displays SPA serializer/deserializer information. • spi4—Displays system packet interface level 4.2 bus device information. • temperature-sensor—Displays temperature sensor information.
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

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.

You can also enter a partially qualified location specifier by using the wildcard (*) character. For example, 0/1/* would display information for all modules on slot 1 in rack 0.

Use the **show hw-module subslot errors** command to display error information related to the specified internal hardware device on a SPA.

Task ID

Task ID	Operations
root-lr	read

Examples

The following example shows partial sample output for the **show hw-module subslot errors** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/0 errors
```

```
Subslot 0/1/0 errors info:
```

```
-----
SPA inserted: YES
SPA type:      4xOC3 POS SPA
SPA operational state: READY
SPA last reset reason: UNKNOWN
SPA last failure reason: UNKNOWN
```

```
Subslot 0/1/1 errors info:
```

```
-----
SPA inserted: YES
SPA type:      1x10GE XFP SPA
SPA operational state: READY
SPA last reset reason: UNKNOWN
SPA last failure reason: UNKNOWN
```

```
Subslot 0/1/2 errors info:
```

```
-----
SPA inserted: NO
```

```
Subslot 0/1/3 errors info:
```

```
-----
SPA inserted: NO
```

```
Subslot 0/1/4 errors info:
```

```
-----
SPA inserted: YES
SPA type:      4xOC48 POS/RPR HHSPA
SPA operational state: READY
```



```

SPA last reset reason: UNKNOWN
SPA last failure reason: UNKNOWN

Subslot 0/1/5 errors info:
-----
SPA inserted: YES
SPA type:      8xGE SPA
SPA operational state: READY
SPA last reset reason: UNKNOWN
SPA last failure reason: UNKNOWN

--More--

```

Table 28: show hw-module subslot errors Field Descriptions

Field	Description
Subslot */*/ errors info	SPA for which error information is being displayed. The location of the SPA is expressed in the <i>rack/slot</i> notation.
SPA inserted	Indication if a SPA is currently detected in the subslot.
SPA type	Description of SPA including the technology type, number of ports, height of SPA (HHSPA—single-height, FHSPA—double-height), and optics type.
SPA operational state	Current operational state of the SPA module.
SPA last reset reason	Reason for the most recent reset of this SPA.
SPA last failure reason	Reason for the last failure on this SPA.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show hw-module subslot plim-subblock

To display SPA firmware information for a shared port adapter (SPA), use the **show hw-module subslot plim-subblock** command in XR EXEC mode.

show hw-module subslot [*node-id*] **plim-subblock**

Syntax Description	<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.

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 hw-module subslot plim-subblock command to display SPA firmware information, both kernel and application information, as well as heartbeat and keepalive information. The show hw-module subslot plim-subblock command is mainly used for debugging purposes.

Task ID	Task ID	Operations
	root-lr	read

Examples	The following example shows sample output for the show hw-module subslot plim-subblock command: <pre>RP/0/0/CPU0:router# show hw-module subslot 0/5/0 plim-subblock Subslot 0/5/0 Plim Subblock Info: ----- Firmware information:</pre>

```
SPA v4.10.1, ifs-spa_ppc_iox.elf
Application v3.44.0, spa_ct3_pat_apps_iox.tar.gz

SPA keepalive information:
Heartbeat check disabled : FALSE
Keepalive seq 372638, seen 372637, Time since last ipc keep 1s
```

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show hw-module subslot registers

To display register information about internal hardware devices for a shared port adapter (SPA), use the **show hw-module subslot registers** command in

EXEC

XR EXEC

mode.

show hw-module subslot [*node-id*] **registers** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • analog-digital-converter—Displays analog-to-digital converter information. • c2w—Displays Cisco-to-wire bus device information. • fpga—Displays SPA field-programmable gate array information. • framer—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • hdlc—Displays SPA hdlc information, where applicable. • l2-tcam—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • mac—Displays SPA MAC information. (Not applicable to POS SPAs.) • pluggable-optics—Displays pluggable-optics module information. • power-margining—Displays power-margining device information. • sar—Displays SPA ATM SAR information. • sdcc—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • serdes—Displays SPA serializer/deserializer information. • spi4—Displays system packet interface level 4.2 bus device information. • temperature-sensor—Displays temperature sensor information.
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

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 command to display the nodes on the router.

You can also enter a partially qualified location specifier by using the wildcard (*) character. For example, 0/1/* would display information for all modules on slot 1 in rack 0.

Use the **show hw-module subslot registers** command to display register information for the specified internal hardware device on the SPA.

Task ID	Task ID	Operations
	root-lr	read

Examples The following example shows sample output for the **show hw-module subslot registers** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/cpu0 registers

Thu Feb 19 00:38:32.908 PST

Subslot 0/1/0 registers info:
-----
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/1 registers info:
-----
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/2 registers info:
-----
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/3 registers info:
-----
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A
```

```
Subslot 0/1/4 registers info:
```

```
-----
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A
```

```
Subslot 0/1/5 registers info:
```

```
-----
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A
```

Table 29: show hw-module subslot registers Field Descriptions

Field	Description
SPA hardware ID	SPA hardware identifier in hexadecimal format.
SPA SW FPGA rev.	SPA software field-programmable gate array (FPGA) revision number in hexadecimal format.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show hw-module subslot status

To display status information about internal hardware devices for a shared port adapter (SPA), use the **show hw-module subslot status** command in XR EXEC mode.

show hw-module subslot [*node-id*] **status** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • analog-digital-converter—Displays analog-to-digital converter information. • c2w—Displays Cisco-to-wire bus device information. • fpga—Displays SPA field-programmable gate array information. • framer—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • hdlc—Displays SPA hdlc information, where applicable. • l2-tcam—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • mac—Displays SPA MAC information. (Not applicable to POS SPAs.) • pluggable-optics—Displays pluggable-optics module information. • power-margining—Displays power-margining device information. • sar—Displays SPA ATM SAR information. • sdcc—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • serdes—Displays SPA serializer/deserializer information. • spi4—Displays system packet interface level 4.2 bus device information. • temperature-sensor—Displays temperature sensor information.
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

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.

You can also enter a partially qualified location specifier by using the wildcard (*) character. For example, 0/1/* would display information for all modules on slot 1 in rack 0.

Use the **show hw-module subslot status** command to obtain status information about an interface on the SPA.

Task ID

Task ID	Operations
root-lr	read

Examples

The following example shows sample output for the **show hw-module subslot status** command with the **temperature-sensor** option:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/2/CPU0 status temperature-sensor

SPA device temperature-sensor index 0 subindex 0 info:

DS1631 (0x0803c2e4) device status:
temperature = 0x1c80 (28.5 degree C)

SPA device temperature-sensor index 0 subindex 0 info:

DS1631 (0x08063bec) device status:
temperature = 0x1e00 (30.0 degree C)
```

Table 30: show hw-module subslot status Field Descriptions

Field	Description
DS1631 (0x0803c2e4) device status	Device for which the temperature status is displayed.
temperature = 0x1c80 (28.5 degree C)	Current temperature of the specified device, in hexadecimal format and degrees Celsius.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

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 { <i>node-id</i> }	(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.
	<i>locationspecifier</i>	(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

Examples

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 31: show inventory Field Descriptions, on page 247](#) describes the significant fields shown in the display.

Table 31: 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 <i>rack/slot</i> 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.

Field	Description
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 <i>node-id</i>	Specifies the node for which to display LED information. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
trace	Displays LED debug traces information.
<i>trace-name</i>	Trace name.
location <i>node-id</i>	Specifies the target location. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation.
<i>trace-attribute</i>	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

Examples

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 32: show led location Field Descriptions

Field	Description
LOCATION	Location of the node. LOCATION is expressed in the <i>rack/slot</i> notation.
LED Name	Name of the LED.
MODE	Current operating mode of the specified node.
COLOR	Color of the LED.

Related Commands

Command	Description
led mode	Changes the message, mode or status of a router card LED display.

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

<i>mda-class</i>	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

Examples

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 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 { <i>node-id</i> all }	(Optional) Specifies the node for which to display LED information. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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)

Examples

```
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
```

Related Commands

Command	Description
redundancy switchover	Causes the primary (active) route processor (RP) to fail over to the redundant standby RP.

show version

To display the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images, use the **show version** command in

XR EXEC

mode.

show version

Syntax Description This command has no keywords or arguments.

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.

The **show version** command displays a variety of system information, including hardware and software version, router uptime, boot settings (configuration register), and active software.

Task ID	Task ID	Operations
	basic-services	read

Examples This example shows partial output from the **show version** command:

```
Cisco IOS XR Software, Version 5.0.0
Copyright (c) 2013 by Cisco Systems, Inc.
```

Build Information:

```
Build By      : palwal
Build On     : Wed Sep 18 11:49:11 PDT 2013
Build Host   : iox-bld4
Workspace    : /auto/srcarchive8/production/5.0.0/all/workspace
Version      : 5.0.0
```

```

Location      : /opt/cisco/XR/packages/
System uptime is 1 day, 1 hour, 24 minutes

```

Table 33: show version Field Descriptions

Field	Description
Cisco IOS XR Software, Version #	Cisco IOS XR software version number currently running on the router.
ROM	System bootstrap version number currently running on the router.
router uptime	Number of uninterrupted days, hours, minutes, and seconds the system has been up and running.
System image file is	Location and name of the system image file currently running on the router.
Packet over SONET/SDH network interface(s)	Number of Packet-over-SONET/SDH interfaces available on the current router.
SONET/SDH Port controller(s)	Number of SONET or SDH ¹ interfaces available on the current router.
Ethernet/IEEE 802.3 interface(s)	Number of Ethernet or IEEE 802.3 interfaces available on the current router.
GigabitEthernet/IEEE interface(s)	Number of Gigabit Ethernet or IEEE 802.3 interfaces available on the current router.
bytes of non-volatile configuration memory	Available volatile configuration memory, in bytes.
bytes of ATA PCMCIA card at disk 0	ATA PCMCIA ² available on the card in disk 0, in bytes.
Package active on node 0/1/SP	Details about the current software package that is running on the SP node in slot 1.

¹ SDH = Synchronous Digital Hierarchy

² ATA PCMCIA = AT Attachment Personal Computer Memory Card Industry Association

upgrade hw-module fpd

To manually upgrade the current field-programmable device (FPD) image package on a module, use the **upgrade hw-module fpd** command in System Admin EXEC mode.

upgrade hw-module location {*node-id*|all} **fpd** {*fpd-type*|all} [**force**]

Syntax Description

all	Upgrades all FPD images on the selected module.
<i>fpd-type</i>	Upgrades a specific field-programmable gate array (FPGA) image on the module. Use the show fpd package command to view all available FPGA images available for a specific module.
force	(Optional) Forces the update of the indicated FPD image package on a shared port adapter (SPA) that meets the minimum version requirements. Without this option, the manual upgrade upgrades only incompatible FPD images.
location { <i>node-id</i> all}	Specifies the node for which to upgrade the FPD image. The <i>node-id</i> argument is expressed in the <i>rack/slotsubslot</i> notation. Use the all keyword to indicate all nodes.

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

Note

The use of the force option when doing a fpd upgrade is not recommended except under explicit direction from Cisco engineering or TAC.

During the upgrade procedure, the module must be offline (shut down but powered).

Naming notation for the *node-id* argument is *rack/slotsubslot*; a slash between values is required as part of the notation.

- *rack* —Chassis number of the rack.
- *slot* —Physical slot number of the SPA interface processor (SIP).

Task ID

Task ID	Operations
sysmgr	read, write

Examples

This example shows how to upgrade the Ethernet Switch and view the output using the **show hw-module fpd** command:

```
sysadmin-vm:0_RP0# upgrade hw-module location 0/RP0 fpd Ethernet
sysadmin-vm:0_RP0# show hw-module fpd
Tue Aug 27 14:54:10.200 UTC
```

Location	Card type	HWver	FPD device	Status	FPD Versions	
					Running	Download
0/0	NC6-10X100G-M	0.2	CCC FPGA	READY	1.14	1.14
0/0	NC6-10X100G-M	0.2	BAO-MB FPGA	READY	1.00	1.00
0/0	NC6-10X100G-M	0.2	CCC Power-On	READY	1.30	1.30
0/0	NC6-10X100G-M	0.2	Ethernet Switch	READY	1.32	1.32
0/0	NC6-10X100G-M	0.2	BIOS FPD	READY	9.10	9.10
0/0	NC6-10X100G-M	1.0	Slice-1 GN2411	READY	2.07	2.07
0/1	NC6-10X100G-M	0.2	CCC FPGA	READY	1.14	1.14
0/1	NC6-10X100G-M	0.2	BAO-MB FPGA	READY	1.00	1.00
0/1	NC6-10X100G-M	0.2	CCC Power-On	READY	1.30	1.30
0/1	NC6-10X100G-M	0.2	Ethernet Switch	READY	1.32	1.32
0/1	NC6-10X100G-M	0.2	BIOS FPD	READY	9.10	9.10
0/1	NC6-10X100G-M	1.0	Slice-1 GN2411	READY	2.07	2.07
0/RP0	NC6-RP	0.1	CCC FPGA	UPGD SKIP	1.00	1.00
0/RP0	NC6-RP	0.1	CCC Power-On	UPGD SKIP	1.30	1.30
0/RP0	NC6-RP	0.1	Ethernet Switch	UPGD SKIP	1.32	1.32
0/RP0	NC6-RP	0.1	CPU Complex FPD	UPGD SKIP	3.06	3.06
0/RP0	NC6-RP	0.1	BIOS FPD	UPGD SKIP	9.10	9.10
0/RP1	NC6-RP	0.1	CCC FPGA	READY	1.00	1.00
0/RP1	NC6-RP	0.1	CCC Power-On	READY	1.30	1.30

Related Commands

Command	Description
show fpd package	Displays which SPAs and SIPs are supported with your current Cisco IOS XR software release, which FPD image you need for each card, and what the minimum hardware requirements are for the various modules.
show hw-module fpd	Displays field-programmable device (FPD) compatibility for all modules or a specific module.



Manageability Commands on

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.
-
- [iteration](#), page 262
 - [session timeout](#), page 264
 - [show xml schema](#), page 266
 - [show xml sessions](#), page 268
 - [shutdown \(VRF\)](#), page 270
 - [throttle](#), page 272
 - [vrf \(XML\)](#), page 274
 - [xml agent](#), page 276
 - [xml agent ssl](#), page 278
 - [xml agent tty](#), page 279

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 <i>iteration-size</i>	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

Examples

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 Commands

Command	Description
xml agent	Enables Extensible Markup Language (XML) requests over a dedicated TCP connection and enters XML agent configuration mode.
xml agent ssl	Enables XML requests over Secure Socket Layer (SSL) and enters SSL XML agent configuration mode.
xml agent tty	Enables XML requests over SSH and Telnet and enters TTY XML agent configuration mode.

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

<i>timeout</i>	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

Examples

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 Commands

Command	Description
xml agent	Enables Extensible Markup Language (XML) requests over a dedicated TCP connection and enters XML agent configuration mode.

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

Examples 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 Commands

Command	Description
copy	Copies a file from a source (such as a network server) to a destination (such as a flash disk).

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

Examples

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 Commands

Command	Description
xml agent	Enables Extensible Markup Language (XML) requests over a dedicated TCP connection and enters XML agent configuration mode.

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

Examples

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 Commands

Command	Description
vrf (XML)	Configures a dedicated agent to receive and send messages via the specified VPN routing and forwarding (VRF) instance.

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.
<i>size</i>	Size of the XML agent memory in MB. Values can range from 100 to 600. The default is 300.
process-rate	Specifies the XML agent processing rate.
<i>tags</i>	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

Examples

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.
<i>vrf-name</i>	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

Examples

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 Commands

Command	Description
xml agent	Enables Extensible Markup Language (XML) requests over a dedicated TCP connection and enters XML agent configuration mode.
xml agent ssl	Enables XML requests over Secure Socket Layer (SSL) and enters SSL XML agent configuration mode.
shutdown (VRF)	Configures the dedicated agent to not receive or send messages via the default VRF.

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

Examples

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

Examples 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 superseded 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

Examples

This example shows how to enable XML requests over Secure Shell (SSH) and Telnet:

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



NTP Commands on

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 \(NTP\), page 283](#)
- [authenticate \(NTP\), page 286](#)
- [authentication-key \(NTP\), page 288](#)
- [broadcast, page 290](#)
- [broadcast client, page 292](#)
- [broadcastdelay, page 294](#)
- [interface \(NTP\), page 295](#)
- [master, page 297](#)
- [max-associations, page 299](#)
- [multicast client, page 301](#)
- [multicast destination, page 303](#)
- [ntp, page 305](#)
- [ntp clear, page 307](#)
- [ntp reset drift, page 308](#)
- [peer \(NTP\), page 310](#)
- [server \(NTP\), page 313](#)
- [show calendar, page 316](#)
- [show ntp associations, page 317](#)

- [show ntp status](#), page 318
- [source \(NTP\)](#), page 320
- [trusted-key](#), page 322
- [update-calendar](#), page 324

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 <i>vrf-name</i>	(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: <i>Network Time Protocol (Version 3)—Specification, Implementation and Analysis</i>) 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.
<i>access-list-name</i>	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

Examples

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.

Command Modes NTP 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 **authenticate** command to enable NTP authentication. When NTP authentication is enabled, the system does not synchronize to a time source unless it carries one of the authentication keys specified by the **trusted-key** command. Packets failing the authentication check are dropped.

Task ID	Task ID	Operations
	ip-services	read, write

Examples 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 Commands

Command	Description
authentication-key (NTP)	Defines an authentication key for a trusted Network Time Protocol (NTP) time source.
trusted-key	Designates a Network Time Protocol (NTP) trusted key.

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

<i>key-number</i>	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.
<i>key-name</i>	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.

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

Examples

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 Commands

Command	Description
authenticate (NTP)	Enables Network Time Protocol (NTP) authentication.
peer (NTP)	Configures the system clock to synchronize a peer or to be synchronized by a peer.
server (NTP)	Allows the system clock to be synchronized by a time server.
trusted-key	Designates a Network Time Protocol (NTP) trusted key.

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 <i>ip-address</i>	(Optional) Specifies the host IPv4 address.
key <i>key-id</i>	(Optional) Defines the authentication key, where <i>key-id</i> is the authentication key to use when sending packets to this peer. The key identified by the <i>key-id</i> value is also used for packets received from the peer.
version <i>number</i>	(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.

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

Examples

The following example shows how to configure Packet-over-SONET/SDH (POS) 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 POS 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast destination 10.0.0.0
```

Related Commands

Command	Description
broadcast client	Allows a networking device to receive Network Time Protocol (NTP) broadcast packets on an interface.
broadcastdelay	Sets the estimated round-trip delay between a Network Time Protocol (NTP) client and an NTP broadcast server.

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.

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.

Task ID	Task ID	Operations
	ip-services	read, write

Examples The following example shows how to configure Packet-over-SONET/SDH (POS) interface 0/0/0/1 to send NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp interface POS 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast client
```


Related Commands

Command	Description
broadcast	Creates a Network Time Protocol (NTP) broadcast server on a specified NTP interface.
broadcastdelay	Sets the estimated round-trip delay between a Network Time Protocol (NTP) client and an NTP broadcast server.

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

<i>microseconds</i>	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.

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

Examples

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

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	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 <i>vrf-name</i>	(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 reenble 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

Examples

The following example shows how to enter NTP configuration mode, specify an NTP interface to be configured, and enter NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface POS 0/1/0/0
RP/0/RP0/CPU0:router(config-ntp-int)#
```

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

<i>stratum</i>	(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.

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

Examples

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
```

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

<i>number</i>	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.

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

Examples

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 Commands

Command	Description
show ntp associations	Displays the status of Network Time Protocol associations.

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

<i>ip-address</i>	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.

Task ID

Task ID	Operations
ip-services	read, write

Examples

The following example shows how to configure the router to receive NTP multicast packets to the multicast group address of 224.0.1.1 through 10-Gigabit Ethernet interface 0/1/1/0:

```
RP/0/RP0/CPU0:router(config)# ntp interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)# multicast client
```

Related Commands

Command	Description
multicast destination	Configures an NTP interface as an NTP multicast server.

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** *tll*] [**version** *number*]

no multicast destination *ip-address* [**key** *key-id*] [**ttl** *tll*] [**version** *number*]

Syntax Description

<i>ip-address</i>	The IPv4 or IPv6 multicast group IP address to which to send NTP multicast packets.
key <i>key-id</i>	(Optional) Specifies an authentication key, where the value of the <i>key-id</i> argument is the authentication key to use when sending multicast packets to the specified multicast group.
tll <i>tll</i>	(Optional) Specifies the time to live (TTL) of a multicast packet.
version <i>number</i>	(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

Examples

The following example shows how to configure the router to send NTP multicast packets to the multicast group address of 224.0.1.1 through 10-Gigabit Ethernet interface 0/1/1/0:

```
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 Commands

Command	Description
multicast client	Configures an NTP interface as an NTP multicast client.

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 <i>vrf-name</i>	(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

Examples

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

<i>peer</i>	IPv4 address or hostname of the NTP peer to be cleared.
all	Clears all NTP peers.
vrf <i>vrf-name</i>	Clears a peer on the specified nondefault VRF.
<i>ip-address</i>	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

Examples

The following example shows how to clear all NTP peers:

```
RP/0/RP0/CPU0:router# ntp clear all
```

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

Examples 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 Commands

Command	Description
show ntp status	Displays the status of NTP.

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 <i>vrf-name</i>	(Optional) Applies the peer configuration to the specified nondefault VRF.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
<i>ip-address</i>	IPv4 or IPv6 address of the peer providing or being provided with the clock synchronization.
version <i>number</i>	(Optional) Defines the Network Time Protocol (NTP) version number, where the <i>number</i> argument is a value from 1 to 4. The default is 4.
key <i>key-id</i>	(Optional) Defines the authentication key, where the <i>key-id</i> 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 <i>interval</i>	(Optional) Defines the shortest polling interval, where the <i>interval</i> argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll <i>interval</i>	(Optional) Defines the longest polling interval, where the <i>interval</i> 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.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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

Examples

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 Packet-over-SONET/SDH (POS) 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 POS 0/0/0/1
```

Related Commands

Command	Description
authentication-key (NTP)	Defines an authentication key for a trusted Network Time Protocol (NTP) time source.
server (NTP)	Allows the system clock to be synchronized by a time server.
source (NTP)	Specifies a particular source address to use in Network Time Protocol (NTP) packets.

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*] [**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 <i>vrf-name</i>	(Optional) Applies the server configuration to the specified nondefault VRF.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
<i>ip-address</i>	IPv4 or IPv6 address of the time server providing the clock synchronization.
version <i>number</i>	(Optional) Defines the Network Time Protocol (NTP) version number, where the <i>number</i> argument is a value from 1 to 4. The default is 4.
key <i>key-id</i>	(Optional) Defines the authentication key, where the <i>key-id</i> argument is the authentication key to use when packets are sent to this peer. By default, no authentication key is used.
minpoll <i>interval</i>	(Optional) Defines the shortest polling interval, where the <i>interval</i> argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll <i>interval</i>	(Optional) Defines the longest polling interval, where the <i>interval</i> 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.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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 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

Examples

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 Commands

Command	Description
authentication-key (NTP)	Defines an authentication key for a trusted Network Time Protocol (NTP) time source.
peer (NTP)	Configures the system clock to synchronize a peer or to be synchronized by a peer.
source (NTP)	Specifies a particular source address to use in Network Time Protocol (NTP) packets.

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

Examples

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 Commands

Command	Description
show clock	Displays the system clock.

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

Examples 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 Commands	Command	Description
	show ntp status	Displays the status of NTP.

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 <i>node-id</i>	(Optional) Displays the status of NTP from the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> 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

Examples

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 34: show ntp status Field Descriptions

Field	Description
synchronized	Synchronized system to an NTP peer.
stratum	NTP stratum of this system.
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 Commands

Command	Description
show ntp associations	Displays the status of Network Time Protocol associations.

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 <i>vrf-name</i>	(Optional) Applies the source address configuration to the specified nondefault VRF.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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

Examples

This example shows how to configure the router to use the IP address of Packet-over-SONET/SDH (POS) 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 POS 0/0/0/1
```

Related Commands

Command	Description
peer (NTP)	Configures the system clock to synchronize a peer or to be synchronized by a peer.
server (NTP)	Allows the system clock to be synchronized by a time server.

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

<i>key-number</i>	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.

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

Examples

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 Commands

Command	Description
authenticate (NTP)	Enables Network Time Protocol (NTP) authentication.
authentication-key (NTP)	Defines an authentication key for a trusted Network Time Protocol (NTP) time source.

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.

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

Examples 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 Commands

Command	Description
clock read-calendar	Manually copies the hardware clock (calendar) settings into the software clock.
clock update-calendar	Copies the software clock settings to the hardware clock (calendar).



Object Tracking Commands in

This chapter describes the Cisco IOS XR software commands used to track objects. For information about how to use these commands to configure object tracking, see *System Management Configuration Guide for Cisco NCS 6000 Series Routers*.

- [delay](#), page 328
- [interface \(track\)](#), page 330
- [line-protocol track](#), page 332
- [object](#), page 334
- [route ipv4](#), page 336
- [show track](#), page 338
- [track](#), page 340
- [threshold percentage](#), page 342
- [threshold weight](#), page 344
- [type line-protocol state](#), page 346
- [type list boolean](#), page 348
- [type list threshold percentage](#), page 350
- [type list threshold weight](#), page 352
- [type route reachability](#), page 354
- [type rtr](#), page 356
- [vrf \(track\)](#), page 358

delay

To configure the delay, in seconds, before the track or interface state should be polled for a change in status, use the **delay** command in track configuration mode. To delete the configuration of delay tracking, use the **no** form of this command.

delay {**up**|**down**} *seconds*

no delay {**up**|**down**} [*seconds*]

Syntax Description

delay up <i>seconds</i>	Sets delay of from 1 to 180 seconds before communication of up status of the tracked object or list of objects.
delay down <i>seconds</i>	Sets delay of from 1 to 180 seconds before communication of down status of the tracked object or list of objects.

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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 **delay** command can be used in conjunction with all track types:

- [type line-protocol state, on page 346](#)
- [type list boolean, on page 348](#)
- [type route reachability, on page 354](#)

When using the **no** form of the command, the use of the *seconds* argument is optional.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

The following example shows that the tracking process is configured to notify the network administrator that the interface should be polled for its up state in five-second intervals:

```
RP/0/RP0/CPU0:router# configuration
RP/0/RP0/CPU0:router(config)# track name1
RP/0/RP0/CPU0:router(config-track)# delay up 5
```

Related Commands

Command	Description
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.

interface (track)

To select an interface object type for tracking purposes, use the **interface** command in interface configuration mode. To delete the configuration of a track based on a particular interface object type, use the **no** form of this command.

interface *type interface-path-id*

no interface *type interface-path-id*

Syntax Description

<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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 access the **interface** command, you must be in line protocol tracking configuration submode.

For information about interface keywords, see *Interface and Hardware Component Command Reference for Cisco NCS 6000 Series Routers*.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

The following example shows the **interface** command in the context of object tracking:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track12
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface atm 0/2/0/0.1
```

Related Commands

Command	Description
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.
type line-protocol state	Configures tracking of the line protocol state of an interface object.
type list boolean	Configures a tracked list of objects based on a Boolean calculation.
type route reachability	Configures the routing process to notify the tracking process when the route state changes due to a routing update.

line-protocol track

To associate a specific track with an IPsec or GRE interface object, use the **line-protocol track** command in interface configuration mode. To delete the association between the track and the IPsec or GRE interface object, use the **no** form of this command.

line-protocol track *object-name*

no line-protocol track *object-name*

Syntax Description

<i>object-name</i>	Name of object being tracked.

Command Default

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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, write

Examples

The following example shows how the **line-protocol track** command is used:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track PREFIX1
RP/0/RP0/CPU0:router(config-track)# type route reachability
```



```
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 7.0.0.0/24
RP/0/RP0/CPU0:router(config-track-route)# interface service-ipsec 1
RP/0/RP0/CPU0:router(config-if)# vrf 1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 70.0.0.2 255.25.255.0
RP/0/RP0/CPU0:router(config-if)# line-protocol track PREFIX1
```

Related Commands

Command	Description
interface (track)	Selects an interface object type for tracking purposes.
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.

object

To configure an object for tracking, use the **object** command in list tracking configuration mode. To delete a previously configured track based on an object, use the **no** form of this command.

object *object-name* [**not**]

no object *object-name*

Syntax Description

<i>object-name</i>	Name of the object to be tracked.
not	(Optional) Deletes a previously configured track based on whether an interface object is not up or down.

Command Default

No default behavior or values

Command Modes

List tracking configuration

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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 delete a previously configured track based on whether an interface object is *not* up or down, use the **not** keyword together with the **object** command in a list of tracked objects based on a Boolean expression.

The **object** command can be used only for a track based on a Boolean expression.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

The following example shows how to configure an object, using the optional **not** keyword, in a tracked list of objects based on a Boolean calculation:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track connection100
RP/0/RP0/CPU0:router(config-track-list)# type list boolean and
RP/0/RP0/CPU0:router(config-track-list)# object obj3 no
```

Related Commands

Command	Description
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.
type list boolean	Configures a tracked list of objects based on a Boolean calculation.

route ipv4

To configure that an IP prefix and subnet mask should be used as the basis to track route reachability, use the **route ipv4** command in route tracking configuration mode. To remove this configuration, use the **no** form of the command.

route ipv4 *IP prefix and subnet mask*

no route ipv4

Syntax Description

IP prefix and subnet mask

Network and subnet mask; for example, 10.56.8.10/16.

Command Default

No default behavior or values

Command Modes

Route tracking configuration

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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 *IP prefix* and *subnet mask* arguments are optional for the **no** form of this command.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

The following example displays use of the **route ipv4** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
```

```
RP/0/RP0/CPU0:router(config-track)# type route reachability  
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 10.56.8.10/16
```

Related Commands

Command	Description
type route reachability	Configures the routing process to notify the tracking process when the route state changes due to a routing update.
vrf (track)	Configures a VRF table to be used as the basis to track route reachability.

show track

To display information about objects that were tracked and to specify the format of the report, use the **show track** command in EXEC mode.

show track [*track-name*] **interface** **ipv4 route**] [**brief**]

Syntax Description

<i>track-name</i>	(Optional) Name of track used for tracking objects; for example, track1.
brief	(Optional) Displays a single line of information related to the preceding argument or keyword.
interface	(Optional) Displays tracked interface objects.
ipv4 route	(Optional) Displays the tracked IPv4 route objects.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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 track** command to display information about objects that are tracked by the tracking process. When no arguments or keywords are specified, information for all objects is displayed.

Task ID

Task ID	Operations
sysmgr	read

Examples

The following sample output illustrates use of the **show track** command:

```
RP/0/RP0/CPU0:router# show track Track_name3

Track_name3
  List boolean and is DOWN
  1 change, last change 10:26:20 SJC Sun Aug 05 2007
    object name2 not UP
    object name1 UP
```

Related Commands

Command	Description
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.

track

To initiate or identify a tracking process used to track the status of an object or list of objects, use the **track** command in global configuration mode. To remove the tracking process, use the **no** form of this command.

track *track-name*

no track *track-name*

Syntax Description

track <i>track-name</i>	Name of track used for tracking objects; for example, track1.

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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.

When you use the **track** command, you enter track configuration mode.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

This example shows that the tracking process is configured to notify the network administrator about the up state of the tracked object list every five seconds:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track LIST2
```



```
RP/0/RP0/CPU0:router# track LIST2 delay up 5
```

Related Commands

Command	Description
delay	Configures the delay, in seconds, before the track or interface state should be polled for a change in status.
show track	Displays information about objects that were tracked and specifies the format of the report.
type line-protocol state	Configures tracking of the line protocol state of an interface object.
type list boolean	Configures a tracked list of objects based on a Boolean calculation.
type route reachability	Configures the routing process to notify the tracking process when the route state changes due to a routing update.

threshold percentage

To configure tracking threshold values based on percentages, use the **threshold percentage** command in track list threshold configuration mode. To remove a threshold percentage, use the **no** form of the command.

threshold percentage up *weight* [**down** *weight*]

Syntax Description

up	Specifies the threshold for the UP state.
<i>weight</i>	Percentage limit at which a track is set to the UP state.
down	Specifies the threshold for the DOWN state.
<i>weight</i>	Percentage limit at which a track is set to the DOWN state.

Command Default

None

Command Modes

Track list threshold configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

Use the **threshold percentage** command to specify the tracking threshold value used to determine the state of a percentage threshold-weighted list. A percentage threshold-weighted list is set to the UP state when the percentage of objects in the UP state is greater than or equal to the UP threshold value. A percentage threshold-weighted list is set to the DOWN state when the percentage of objects in UP state is less than or equal to the DOWN threshold value.

Task ID

Task ID	Operation
sysmgr	read, write

Examples

This example shows how to specify the weight thresholds for a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)# threshold percentage up 50 down 33
```

Related Commands

Command	Description
type list threshold percentage	Configures a tracked list of objects based on a percentage threshold.

threshold weight

To configure tracking threshold values based on weights, use the **threshold weight** command in track list threshold configuration mode. To remove a threshold weight, use the **no** form of the command.

threshold weight up *weight* [**down** *weight*]

Syntax Description

up	Specifies the threshold for the UP state.
<i>weight</i>	Weight limit at which a track is set to the UP state.
down	Specifies the threshold for the DOWN state.
<i>weight</i>	Weight limit at which a track is set to the DOWN state.

Command Default

None

Command Modes

Tack list threshold configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

Use the **threshold weight** command to specify the threshold value used to determine the state of a threshold-weighted list. When the cumulative sum of the weight of objects in the UP state is greater than or equal to the UP threshold value, the threshold-weighted list is set to the UP state. A threshold-weighted list is set to the DOWN state when the cumulative sum of the weight of objects in the UP state is less than or equal to the DOWN threshold value.

Task ID

Task ID	Operation
sysmgr	read, write

Examples

This example shows how to specify the weight thresholds for a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)# threshold weight up 18 down 5
```

Related Commands

Command	Description
type list threshold weight	Configures a tracked list of objects based on a weight threshold.

type line-protocol state

To configure tracking of the line protocol state of an interface object, use the **type line-protocol** command in track configuration mode. To delete the configuration of line-protocol tracking, use the **no** form of this command.

type line-protocol state

no type line-protocol state

Command Default No default behavior or values

Command Modes Track configuration

Command History	Release	Modification
	Release 3.7.0	No modification.
	Release 3.8.0	No 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 **type line-protocol state** command can be used in conjunction with the **delay** command to configure the delay, in seconds, before the track or interface state should be polled for a change in its status.

The **type line-protocol state** command enters line-protocol tracking configuration mode.

Task ID	Task ID	Operations
	sysmgr	read, write

Examples This example shows how to use the **type line-protocol state** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track12
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
```

Related Commands

Command	Description
delay	Configures the delay, in seconds, before the track or interface state should be polled for a change in status.
interface (track)	Selects an interface object type for tracking purposes.
show track	Displays information about objects that were tracked and specifies the format of the report.
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.

type list boolean

To configure a tracked list of objects based on a Boolean calculation, use the **type list boolean** command in track configuration mode. To remove an object tracking list based on a Boolean calculation, use the **no** form of the command.

```
type list boolean {and| or}
no type list boolean {and| or}
```

Syntax Description	and	Specifies that the list is up if all objects are up, or down if one or more objects are down. For example, when tracking two interfaces, up means that both interfaces are up, and down means that either interface is down.
	or	Specifies that the list is up if at least one object is up. For example, when tracking two interfaces, up means that either interface is up, and down means that both interfaces are down.

Command Default No default behavior or values

Command Modes Track configuration

Command History	Release	Modification
	Release 3.7.0	No modification.
	Release 3.8.0	No 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 **type list boolean** command enters the list tracking configuration mode, and can be used in conjunction with the **delay** command to configure the delay, in seconds, before the track or interface state should be polled for a change in its status.

To remove a track based on whether an interface object is *not* up or down, use the **not** keyword together with the **object** command as shown in the example that follows.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

This example shows how to use the **type list boolean** command in creating a list of objects to be tracked:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track LIST2
RP/0/RP0/CPU0:router(config-track)# type list boolean and
RP/0/RP0/CPU0:router(config-track-list)# object IPsec1 not
RP/0/RP0/CPU0:router(config-track-list)# object IPsec2
RP/0/RP0/CPU0:router(config-track-list)# object PREFIX1
RP/0/RP0/CPU0:router(config-track-list)# exit
RP/0/RP0/CPU0:router(config)# track IPsec1
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface GigabitEthernet 0/0/0/3
RP/0/RP0/CPU0:router(config-track-line-prot)# exit
RP/0/RP0/CPU0:router(config-track)# track IPsec2
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface ATM0/2/0.1
RP/0/RP0/CPU0:router(config-track-line-prot)# exit
RP/0/RP0/CPU0:router(config)# track PREFIX1
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 7.0.0.0/24
RP/0/RP0/CPU0:router(config-track-route)# exit
RP/0/RP0/CPU0:router(config-track)# interface service-ipsec 1
RP/0/RP0/CPU0:router(config-if)# vrf 1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 70.0.0.2 255.255.255.0
RP/0/RP0/CPU0:router(config-if)# profile vrf_1_ipsec
RP/0/RP0/CPU0:router(config-if)# line-protocol track LIST2
RP/0/RP0/CPU0:router(config-if)# tunnel source 80.0.0.2
RP/0/RP0/CPU0:router(config-if)# tunnel destination 80.0.0.1
RP/0/RP0/CPU0:router(config-if)# service-location preferred-active 0/2/0
RP/0/RP0/CPU0:router(config-if)# commit
```

Related Commands

Command	Description
delay	Configures the delay, in seconds, before the track or interface state should be polled for a change in status.
line-protocol track	Associates a specific track with an IPsec or GRE interface object.
object	Configures an object for tracking.
show track	Displays information about objects that were tracked and specifies the format of the report.
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.
type line-protocol state	Configures tracking of the line protocol state of an interface object.
type route reachability	Configures the routing process to notify the tracking process when the route state changes due to a routing update.

type list threshold percentage

To configure a tracked list of objects based on a percentage threshold, use the **type list threshold percentage** command in track configuration mode. To remove an object tracking list based on a percentage threshold, use the **no** form of the command.

type list threshold percentage

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Track configuration

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines Use the **type list threshold percentage** command to create a weighted list of objects to be tracked. A percentage threshold-weighted list is set to the UP state when the percentage of objects in the UP state is greater than or equal to the UP threshold value as set in the **threshold percentage** command. A percentage threshold-weighted list is set to the DOWN state when the percentage of objects in UP state is less than or equal to the DOWN threshold value as set in the **threshold percentage** command.

Use the **object** command to add tracked objects to the threshold-weighted list. A maximum of 200 track objects are allowed.

Task ID	Task ID	Operation
	sysmgr	read, write

Examples This example shows how to add objects to a percentage threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold percentage
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 2
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 3
```

Related Commands

Command	Description
object	Configures an object for tracking.
threshold percentage	Configures tracking threshold values based on percentages.

type list threshold weight

To configure a tracked list of objects based on a weight threshold, use the **type list threshold weight** command in track configuration mode. To remove an object tracking list based on a weight threshold, use the **no** form of the command.

type list threshold weight

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Track configuration

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines Use the **type list threshold weight** command to create a weighted list of objects to be tracked. A threshold-weighted list is set to the UP state when the cumulative sum of the weight of objects in the UP state is greater than or equal to the UP threshold value as set in the **threshold weight** command. A threshold-weighted list is set to the DOWN state when the cumulative sum of the weight of objects in the UP state is less than or equal to the DOWN threshold value as set in the **threshold weight** command.

Use the **object** command to add tracked objects to the threshold-weighted list. A maximum of 200 track objects are allowed.

Task ID	Task ID	Operation
	sysmgr	read, write

Examples This example illustrates how to add objects to a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track t4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1 weight 10
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 2 weight 5
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 3 weight 3
```

Related Commands

Command	Description
object	Configures an object for tracking.
threshold weight	Configures tracking threshold values based on weights.

type route reachability

To configure the routing process to notify the tracking process when the route state changes due to a routing update, use the **type route reachability** command in track configuration mode. To remove a track based on route reachability, use the **no** form of this command.

type route reachability

no type route reachability

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes Track configuration

Command History	Release	Modification
	Release 3.7.0	No modification.
	Release 3.8.0	No 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 tracked IP-route object is considered up and reachable when a routing-table entry exists for the route and the route is not inaccessible.

The **type route reachability** command can be used in conjunction with the **delay** command to configure the delay, in seconds, before the track or interface state should be polled for a change in its status.

The route reachability tracking process is based on either of the following, depending on your router type:

- **vrf**—A VRF table name.
- **route**—An IPv4 prefix consisting of the network and subnet mask (for example, 10.56.8.10/16).

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

This example shows how to track for route reachability:

```
RP/0/RP0/CPU0:router# configure  
RP/0/RP0/CPU0:router(config)# track track22  
RP/0/RP0/CPU0:router(config-track)# type route reachability
```

Related Commands

Command	Description
delay	Configures the delay, in seconds, before the track or interface state should be polled for a change in status.
show track	Displays information about objects that were tracked and specifies the format of the report.
track	Initiates or identifies a tracking process used to track the status of an object or list of objects.

type rtr

To configure the router to track the return code of IP service level agreement (SLA) operations, use the **type rtr** command in track configuration mode. To remove a track based on IP SLA return code, use the **no** form of this command.

type rtr *ipsla-no* **reachability**

no type rtr

Syntax Description

<i>ipsla-no</i>	IP SLA operation number. Values can range from 1 to 2048.
reachability	Tracks whether the route is reachable or not.

Command Default

None

Command Modes

Track 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 **type rtr** command in conjunction with a configuration that uses:

- The **track** keyword in the **permit** command within an ACL definition. For example:

```
ipv4 access-list abf-track
 10 permit any any nexthop track track1 1.2.3.4
```

- An IP service level agreement configuration.

Task ID

Task ID	Operation
sysmgr	read, write

Examples

This example shows how to configure IPSLA object tracking:

```
RP/0/RP0/CPU0:router# configure  
RP/0/RP0/CPU0:router(config)# track track22  
RP/0/RP0/CPU0:router(config-track)# type rtr 1 reachability
```

vrf (track)

To configure a VRF table to be used as the basis to track route reachability, use the **vrf** command in route tracking configuration mode. To delete the configuration of a VRF table for the purpose of IP route tracking purposes, use the **no vrf** form of the command.

vrf *vrf-table-name*

no vrf [*vrf-table-name*]

Syntax Description

<i>vrf-table-name</i>	Network and subnet; for example, 10.56.8.10/16.

Command Default

No default behavior or values

Command Modes

Route tracking configuration

Command History

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No 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, write

Examples

The following example displays the use of the **vrf** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type route reachability
```

```
RP/0/RP0/CPU0:router(config-track-route)# vrf vrf1
```

Related Commands

Command	Description
delay	Configures the delay, in seconds, before the track or interface state should be polled for a change in status.
route ipv4	Configures an IP prefix and subnet mask to be used as the basis to track route reachability.
type route reachability	Configures the routing process to notify the tracking process when the route state changes due to a routing update.



Process and Memory Management Commands on

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, page 362](#)
- [dumpcore, page 364](#)
- [exception filepath, page 367](#)
- [exception pakmem, page 371](#)
- [exception sparse, page 373](#)
- [exception sprsize, page 375](#)
- [follow, page 377](#)
- [monitor processes, page 379](#)
- [monitor threads, page 384](#)
- [process, page 388](#)
- [process mandatory, page 390](#)
- [show context, page 392](#)
- [show dll, page 395](#)
- [show exception, page 398](#)
- [show memory, page 401](#)
- [show memory compare, page 403](#)
- [show memory heap, page 406](#)
- [show processes, page 408](#)

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 { <i>node-id</i> all }	(Optional) Clears core dump context information for a specified node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation. Use the all keyword to indicate all nodes.

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 clear context command to clear core dump context information. If you do not specify a node with the location <i>node-id</i> 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

Examples	The following example shows how to clear core dump context information:

RP/0/RP0/CPU0:router# **clear context**

Related Commands

Command	Description
show context	Displays core dump context information.

dumpcore

To manually generate a core dump, use the **dumpcore** command in administration EXEC mode or in EXEC

XR EXEC

or
System 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.
<i>job-id</i>	Process instance identifier.
location <i>node-id</i>	Generates a core dump for a process running on the specified node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> notation.

Command Default

No default behavior or values

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 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 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

Task ID

Task ID	Operations
diag	read, write

Examples

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/CPU0:Sep 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/CPU0:Sep 22 01:40:26.993 : dumper[54]: %DUMPER-6-SPARSE_CORE_DUMP :
Sparse core dump as configured dump sparse for all
RP/0/RP0/CPU0:Sep 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/CPU0:Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libplatform.dll 0xfc0d5000 0x0000a914 0xfc0e0000 0x00002000 0
RP/0/RP0/CPU0:Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libsysmgr.dll 0xfc0e2000 0x0000ab48 0xfc0c295c 0x00000368 0
RP/0/RP0/CPU0:Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libinfra.dll 0xfc0ed000 0x00032de0 0xfc120000 0x00000c90 0
RP/0/RP0/CPU0:Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libios.dll 0xfc121000 0x0002c4bc 0xfc14e000 0x00002000 0
RP/0/RP0/CPU0:Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libc.dll 0xfc150000 0x00077ae0 0xfc1c8000 0x00002000 0
RP/0/RP0/CPU0:Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libsyslog.dll 0xfc1d2000 0x0000530c 0xfc120c90 0x00000308 0
RP/0/RP0/CPU0:Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libbackplane.dll 0xfc1d8000 0x0000134c 0xfc0c2e4c 0x000000a8 0
RP/0/RP0/CPU0:Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libnodeid.dll 0xfc1e5000 0x00009114 0xfc1e41a8 0x00000208 0
RP/0/RP0/CPU0:Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttyserver.dll 0xfc1f1000 0x0003dfcc 0xfc22f000 0x00002000 0
RP/0/RP0/CPU0:Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttytrace.dll 0xfc236000 0x00004024 0xfc1e44b8 0x000001c8 0
RP/0/RP0/CPU0:Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libdebug.dll 0xfc23b000 0x0000ef64 0xfc1e4680 0x00000550 0
RP/0/RP0/CPU0:Sep 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/libbbag.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/libttypgmtconnection.dll 0xfce85000 0x00004208 0xfce8a000 0x00000468 0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttypgmt.dll 0xfcea4000 0x0000e944 0xfce8abf0 0x000003c8 0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttypnmspc.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 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

<i>filepath-name</i>	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 35: Default Core Dump File Naming Convention Description](#), on page 368.

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 35: Default Core Dump File Naming Convention Description, on page 368](#) describes the default core dump file naming convention.

Table 35: Default Core Dump File Naming Convention Description

Field	Description
<i>process</i>	Name of the process that generated the core dump.
.by. <i>requester</i> .abort	If the core dump was generated because of a request by a process (requester), the core filename contains the string “.by. <i>requester</i> ” where the <i>requester</i> 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.

Field	Description
<code>.sparse</code>	If a sparse core dump was generated instead of a full core dump, “sparse” appears in the core dump filename.
<code>.date-time</code>	Date and time the dumper process was called by the process manager to generate the core dump. The <code>.date-time</code> time-stamp variable is expressed in the <code>yyyy.mm.dd-hh.mm.ss</code> format. Including the time stamp in the filename uniquely identifies the core dump filename.
<code>.node</code>	Node ID, expressed in the <code>rack/slot</code> notation, where the process that generated the core dump was running.
<code>.processor-type</code>	Type of processor (mips or ppc).
<code>.Z</code>	If the core dump was sent compressed, the filename contains the <code>.Z</code> 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

Examples

The following example shows how to use the command:

```
RP/0/RP1/CPU0:Linkwood(config)#exception filepath fl
```

Related Commands

Command	Description
exception pakmem	Configures the collection of packet memory information in core dump files.
exception sparse	Enables or disables sparse core dumps.

exception filepath

Command	Description
exception sprsize	Specifies the maximum file size for core dumps.
show exception	Displays the configured core dump settings.

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

Examples

The following example shows how to configure core dumps to include packet memory information:

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

Related Commands

Command	Description
exception filepath	Modifies core dump settings.
exception sparse	Enables or disables sparse core dumps.
exception sprsize	Specifies the maximum file size for core dumps.
show exception	Displays the configured core dump settings.

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.

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.



Note

Use the **exception sparse off** command in administration configuration mode to get a complete coredump of the transient processes on the RP.

Task ID

Task ID	Operations
diag	read, write

Examples

The following example shows how to enable sparse core dumps:

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

Related Commands

Command	Description
exception filepath	Modifies core dump settings.
exception pakmem	Configures the collection of packet memory information in core dump files.
exception sprsize	Specifies the maximum file size for core dumps.
show exception	Displays the configured core dump settings.

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 373](#) 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.

Task ID

Task ID	Operations
diag	read, write

Examples

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 Commands

Command	Description
exception sparse	Enables or disables sparse core dumps.

follow

To unobtrusively debug a live process or a live thread in a process, use the **follow process** command in System Admin EXEC mode.

follow process [*pid*] **location** *node-id*

Syntax Description

<i>pid</i>	Follows the process with the process ID (PID) specified for the <i>pid</i> argument.
location <i>node-id</i>	Follows the target process on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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

System Admin EXEC

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

Examples

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 Commands

Command	Description
monitor threads	Displays auto-updating statistics on threads in a full-screen mode.
show processes	Displays information about active processes.

monitor processes

To display auto-updating statistics on processes in a full-screen mode, use the **monitor processes** command in XR EXEC mode.

monitor processes [**dumbtty**] [**location** *node-id*]

Syntax Description

dumbtty	(Optional) Displays the output of the command as if on a dumb terminal (the screen is not refreshed).
location <i>node-id</i>	(Optional) Displays the output of the command from the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.

Command Default

If you omit all keywords, the **monitor processes** command displays the top 10 processes of CPU usage 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 by pressing the **q** key.

Command Modes

XR EXEC

Command History

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

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 **monitor processes** command to display the top ten processes based on CPU usage. The display refreshes every 10 seconds.

- To change the parameters displayed by the **monitor processes** command, enter one of the interactive commands described in [Table 36: Interactive Commands Available for the monitor processes Command, on page 380](#).
- To terminate the display and return to the system prompt, enter the **q** key.
- To list the interactive commands, type **?** during the display.

Table 36: Interactive Commands Available for the monitor processes Command

Command	Description
?	Displays the available interactive commands.
c	Sorts display by number of open channels.
d	Changes the delay interval between updates.
f	Sorts display by number of open files.
k	Kills a process.
l	Refreshes the screen.
m	Sorts display by memory used.
n	Changes the number of processes to be displayed.
q	Quits the interactive display and returns the prompt to EXEC mode.
t	Sorts display by time (default).

Task ID

Task ID	Operations
basic-services	execute

Examples

The following example shows sample output from the **monitor processes** command:

```
RP/0/RP0/CPU0:router# monitor processes

195 processes; 628 threads; 3300 channels, 4579 fds
CPU states: 47.6% idle, 1.2% user, 51.1% kernel
Memory: 2048M total, 1576M avail, page size 4K

      JID TIDS Chans   FDs Tmrs   MEM   HH:MM:SS   CPU   NAME
      1   27  198     8    1     0   5:53:31  51.11% kernel
      52    5  215    44    5  228K   0:00:02   0.52% devc-conaux
     342    4  195    14    6    1M   0:00:08   0.34% wdsysmon
  495806    1    1    10    0  648K   0:00:00   0.16% ptop
```



```

293   7   31   39   11   352K   0:00:09   0.07% shelfmgr
55    11  24   14    5    16M   0:00:29   0.06% eth_server
121   3   10    8    2   564K   0:00:05   0.02% bcm_process
311   4    7   18    4   216K   0:00:02   0.01% sysdb_medusa_s
138   4   14   40    5   240K   0:00:01   0.01% devc-vty
265   5   31   19    4   204K   0:00:09   0.01% packet

```

The following example shows sample output from the **monitor processes** command using the optional **location node-id** keyword and argument: **monitor processes**

```
RP/0/RP0/CPU0:router# monitor processes location 0/RP0/CPU0
```

```

202 processes; 724 threads; 3750 channels, 5092 fds
CPU states: 48.8% idle, 0.8% user, 1.5% kernel
Memory: 2048M total, 1526M avail, page size 4K

```

JID	TIDS	Chans	FDs	Tmrs	MEM	HH:MM:SS	CPU	NAME
1	27	205	3	1	0	10:54:12	1.52%	procnto-600-smp-cisco-instr
264	5	42	19	4	272K	0:00:15	0.37%	packet
53	2	202	564	0	1M	0:00:06	0.10%	dllmgr
180	15	93	42	6	1M	0:00:19	0.05%	gsp
69	22	94	8	3	1M	0:00:54	0.04%	qnet
67	5	4	6	0	956K	0:00:04	0.03%	pkgfs
156	2	6	18	1	480K	0:00:00	0.02%	envmon
294	1	6	12	1	112K	0:00:00	0.02%	showd_lc
314	3	185	14	4	1M	0:00:17	0.02%	sysdb_svr_local
310	4	7	18	4	276K	0:00:07	0.02%	sysdb_medusa_s

The following example shows sample output from the **show processes** command using the **dumbtty** optional keyword:

```
RP/0/RP0/CPU0:router# monitor processes dumbtty
```

```

Computing times...195 processes; 628 threads; 3721 channels, 4801 fds
CPU states: 37.1% idle, 1.1% user, 61.7% kernel
Memory: 2048M total, 1576M avail, page size 4K

```

JID	TIDS	Chans	FDs	Tmrs	MEM	HH:MM:SS	CPU	NAME
1	27	198	6	1	0	6:33:33	61.76%	kernel
544958	1	1	8	0	648K	0:00:00	0.64%	ptop
293	7	31	39	11	352K	0:00:10	0.10%	shelfmgr
180	15	82	42	6	5M	0:00:26	0.10%	gsp
304	3	14	29	7	304K	0:00:02	0.06%	statsd_manager
55	11	24	14	5	16M	0:00:32	0.03%	eth_server
70	22	91	8	3	1M	0:00:31	0.03%	qnet
153	2	35	18	4	120K	0:00:01	0.03%	dsc
303	3	25	34	5	292K	0:00:00	0.03%	statsd_server
121	3	10	8	2	564K	0:00:06	0.03%	bcm_process

```

195 processes; 628 threads; 3409 channels, 4601 fds
CPU states: 46.5% idle, 0.5% user, 52.8% kernel
Memory: 2048M total, 1576M avail, page size 4K

```

JID	TIDS	Chans	FDs	Tmrs	MEM	HH:MM:SS	CPU	NAME
1	27	198	6	1	0	6:33:44	52.89%	kernel
52	5	215	44	5	228K	0:00:06	0.38%	devc-conaux
309	6	25	23	8	352K	0:00:08	0.03%	sysdb_mc
315	3	177	14	4	1M	0:00:12	0.03%	sysdb_svr_local
138	4	14	40	5	240K	0:00:02	0.02%	devc-vty
298	9	25	111	9	2M	0:00:09	0.01%	snmpd
67	4	4	7	0	804K	0:00:04	0.00%	pkgfs
53	2	195	547	0	944K	0:00:06	0.00%	dllmgr
311	4	7	18	4	216K	0:00:03	0.00%	sysdb_medusa_s
342	4	195	14	6	1M	0:00:08	0.00%	wdsysmon

Table 37: monitor processes Field Descriptions

Field	Description
JID	Job ID.
TIDS	Thread ID.
Chans	Number of open channels.
FDs	Number of open file descriptors.
Tmrs	Number of timers.
MEM	Dynamic memory currently in use.
HH:MM:SS	Run time of process since last restart.
CPU	Percentage of CPU used by process thread.
NAME	Process name.

Examples

When the **n** or **d** interactive command is used, the **monitor processes** command prompts you to enter a number. For example, when the interactive command **n** is entered, the prompt responds as shown in the following example:

```

Enter number of procs to display: 15

195 processes; 628 threads; 3375 channels, 4495 fds
CPU states: 49.0% idle, 0.9% user, 50.0% kernel
Memory: 2048M total, 1576M avail, page size 4K

  JID TIDS Chans  FDs Tmrs  MEM  HH:MM:SS  CPU  NAME
    1   27  198    2    1    0   6:11:43 50.01% kernel
    52    5  215   44    5  228K  0:00:05  0.72% devc-conaux
  293    7   31   39   11  352K  0:00:09  0.04% shelfmgr
  315    3  177   14    4    1M  0:00:11  0.03% sysdb_svr_local
  304    3   14   29    7  304K  0:00:01  0.02% statsd_manager
  309    6   25   23    8  352K  0:00:08  0.02% sysdb_mc
  342    4  195   14    6    1M  0:00:08  0.01% wdsysmon
  298    9   25  111    9    2M  0:00:09  0.00% snmpd
  265    5   31   19    4  204K  0:00:09  0.00% packet
  153    2   35   18    4  120K  0:00:00  0.00% dsc
  290    4    6   17    2  112K  0:00:00  0.00% sc_reddrv
  275    7   34   36    7  588K  0:00:00  0.00% qlink
  303    3   25   34    5  292K  0:00:00  0.00% statsd_server
  262    5   23   46    6    1M  0:00:00  0.00% ospf
  239    3   26   31    9  452K  0:00:00  0.00% lpts_pa

```

If the number you enter is outside the acceptable range, you are prompted for another number:

```

Enter number of procs to display: 435
Please enter a number between 5 and 40
Enter number of procs to display:

```

Related Commands

Command	Description
show processes	Displays information about active processes.

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 <i>number</i>	(Optional) Number of times the statistics display is to be updated, in the range from 0 to 4294967295.
location <i>node-id</i>	(Optional) Displays the output from the command from the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> 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 38: Interactive Display Commands for the monitor threads Command](#), on page 385.
 - To terminate the display and return to the system prompt, enter the **q** key.
 - To list the interactive commands, type **?** during the display.

Table 38: Interactive Display Commands for the **monitor threads** Command, on page 385 describes the available interactive display commands.

Table 38: 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

Examples

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 39: monitor threads Field Descriptions, on page 386 describes the significant fields shown in the display.

Table 39: 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.

Examples

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 Commands

Command	Description
monitor processes	Displays auto-updating statistics on processes in a full-screen mode.

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.
<i>executable-name</i>	Executable name of the process to be crashed or restarted. Supplying an executable name for the <i>executable-name</i> argument performs the action for all the simultaneously running instances of the process, if applicable.
<i>IID</i>	Process instance ID of the process to be crashed or restarted. Supplying a process ID for the <i>IID</i> argument performs the action for only the process instance associated with the process ID.
location <i>node-id</i>	Crashes or restarts a process on the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> 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

Examples

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 Commands

Command	Description
process mandatory	Sets the mandatory reboot options for a process.
show processes	Displays information about active processes.

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-name|job-id} **location** node-id

process mandatory toggle

process mandatory toggle {executable-name|job-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.
<i>executable-name</i>		Executable name of the process to be terminated. Specifying an executable name for the <i>executable-name</i> argument terminates the process and all the simultaneously running copies, if applicable.
<i>job-id</i>		Job ID associated with the process to be terminated. Terminates only the process associated with the job ID.
location <i>node-id</i>		Sets the mandatory settings for a process on a designated node. The node-id argument is expressed in the <i>rack/slot</i> 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

Examples

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 Commands

Command	Description
show processes	Displays information about active processes.

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

<i>coredump-occurrence</i>	(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 { <i>node-id</i> all }	Displays core dump information that occurred on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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 362](#) command to clear core dump context information.

Task ID

Task ID	Operations
diag	read

Examples

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 40: show context Field Descriptions, on page 393](#) describes the significant fields shown in the display.

Table 40: 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.

show context

Field	Description
Core for process at	File path to the core dump file.
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 Commands

Command	Description
clear context	Clears core dump context information.

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 <i>job-id</i>	(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 <i>virtual-address</i> argument.
address <i>virtual-address</i>	(Optional) Displays the DLL that is mapped at the virtual address specified for the <i>virtual-address</i> argument.
dllname <i>dll-virtual-path</i>	(Optional) Displays the process IDs (PIDs) of the process that have downloaded the DLL specified for the <i>dll-virtual-path</i> argument.
memory	(Optional) Displays a summary of DLL memory usage.
location <i>node-id</i>	(Optional) Displays DLLs for the specified node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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

Examples

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/libbios.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/libbios.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 41: [show dll Field Descriptions, on page 397](#) describes the significant fields shown in the display.

Table 41: 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 42: [show dll dllname Field Descriptions, on page 397](#) describes the significant fields shown in the display.

Table 42: 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 <i>process-name</i>	(Optional) Specifies the process for which to display the information.
location <i>node-id</i>	(Optional) Displays configured settings for a specified node. The <i>node-id</i> argument is expressed in the <i>rack/slot</i> 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 367
- [exception pakmem](#), on page 371
- [exception sparse](#), on page 373
- [exception sprsize](#), on page 375

Task ID

Task ID	Operations
diag	read

Examples

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 Commands

Command	Description
exception filepath	Modifies core dump settings.
exception pakmem	Configures the collection of packet memory information in core dump files.
exception sparse	Enables or disables sparse core dumps.
exception sprsize	Specifies the maximum file size for core dumps.

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 <i>node-id</i>	Displays the available physical memory from the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
pid <i>pid</i>	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

Examples

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
*****
```

show memory

```
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 Commands

Command	Description
show memory heap	Displays information about the heap space for a process.
show processes	Displays information about active processes.

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

Examples

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 43: 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 Commands

Command	Description
show memory heap	Displays information about the heap space for a process.
show processes	Displays information about active processes.

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	<i>pid</i> Process ID						
Command Default	None						
Command Modes	System Admin EXEC XR EXEC						
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 3.9.0</td><td>No modification.</td></tr> <tr> <td>Release 5.0.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 3.9.0	No modification.	Release 5.0.0	This command was introduced.
Release	Modification						
Release 3.9.0	No modification.						
Release 5.0.0	This command was introduced.						
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>basic-services</td><td>read</td></tr> </table>	Task ID	Operations	basic-services	read		
Task ID	Operations						
basic-services	read						

Examples

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 Commands

Command	Description
show memory	Displays the available physical memory and memory usage information of processes on the router.

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

<i>process-name</i>	Name of the executable.
detail	Displays detailed information of the process.
run	Displays information of running processes.
location <i>node-id</i>	Displays information about the active processes from a designated node. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
aborts	Displays process abort information.
all	Displays summary process information for all processes.
blocked	Displays details about reply, send, and mutex blocked processes.
<i>PID</i>	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 <i>service name</i>	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 GuidelinesUse the **show processes** command to display process level information across the system.**Task ID**

Task ID	Operations
basic-services	read

Examples

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

show processes

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	udev
1712	116 KB	636 KB	136 KB	4540 KB	udev
1722	324 KB	16164 KB	136 KB	148164 KB	pm

Table 44: show processes memory Field Descriptions

Field	Description
PID	Process ID.
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 Commands

Command	Description
monitor processes	Displays auto-updating statistics on processes in a full-screen mode.
monitor threads	Displays auto-updating statistics on threads in a full-screen mode.



Secure Domain Router Commands on

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*.

- [location \(SDR\)](#), page 412
- [pair \(SDR\)](#), page 414
- [show sdr](#), page 416

location (SDR)

To assign a node to a secure domain router (SDR), use the **location** command in SDR configuration mode. To remove a node from an SDR and return the node to the owner SDR, use the **no** form of this command.

location *node-location*

no location

Syntax Description

<i>node-location</i>	Node location string.

Command Default

All nodes are assigned to the owner SDR.

Command Modes

SDR 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 **location** command to assign a node to an SDR. By default, all nodes belong to the owner SDR. When a node is assigned to a non-owner SDR, it is automatically removed from the owner SDR inventory.

Use the **no** form of the **location** command to remove a node from an SDR. Removing a node from an SDR implicitly returns it to the owner SDR. When a node has been removed from an SDR, it can be reassigned to another SDR. To remove the designated secure domain router system controller (DSDRSC), you must first remove all other nodes in the SDR. You cannot remove the designated system controller (DSC) from the owner SDR.



Note

Removing all nodes from an SDR deletes the secure domain router from the configuration.

Task ID

Task ID	Operations
system	read, write

Related Commands

Command	Description
pair (SDR)	Assigns a distributed route processor (DRP) pair to a secure domain router (SDR).

pair (SDR)

To assign a distributed route processor (DRP) pair to a secure domain router (SDR), use the **pair** command in SDR configuration mode. To remove a DRP pair from the configuration, use the **no** form of this command.

pair *pair-name* { **rp1** | **rp2** }

no pair *pair-name*

Syntax Description

<i>pair-name</i>	Specifies a DRP pair to be assigned to the specified secure domain router. The <i>pair-name</i> argument is the name assigned to the DRP pair. For instructions to create a DRP pair name, see the pairing (drp) command in the <i>Distributed Route Processor Commands on Cisco IOS XR Software</i> .
rp1 rp2	RP node location.

Command Default

None

Command Modes

SDR configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 5.0.0	This command was introduced.
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.

Use the **pair** command with the *pair-name* argument to assign a DRP pair to an SDR. Enter the **pair** command with the **primary** keyword to assign the DRP pair as the DSDRSCs (primary and standby DSDRSCs).

To assign a DRP pair to an SDR, you must first create a DRP pair name as described in *Distributed Route Processor Commands on Cisco IOS XR Software* and *Configuring Secure Domain Routers on Cisco IOS XR Software*. When the DRP pair is created, you can add the *pair-name* to the SDR.

When a DRP pair is assigned to a non-owner SDR, it is automatically removed from the owner SDR inventory. When a DRP pair is removed from a non-owner SDR configuration, it is automatically returned to the owner SDR inventory.

RP has precedence over DRPs for DSDRSC configuration. If an SDR already includes an RP, the RP must become the DSDRSC.

Use the **no** form of the **pair** command to remove the DRP pair from an SDR. Removing a DRP pair from an SDR implicitly returns it to the owner SDR. When a DRP pair has been removed from an SDR, it can be reassigned to another SDR.

Task ID

Task ID	Operation
system	read, write

Examples

The following example shows how to enter SDR configuration mode and add a DRP pair as the DSDRSC. The command **show configuration** is used in SDR configuration mode to display the SDR configuration.

```
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# pair drp1 primary
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# show configuration
```

```
Building configuration... sdr rname2 pair drp1 primary
! end
```

The following example shows how to enter SDR configuration mode and remove a DRP pair from the SDR configuration:

```
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# no pair drp1
```

Related Commands

Command	Description
location (DRP)	Assigns nodes to a DRP pair.
pairing (DRP)	Specifies a distributed router processor (DRP) pair and enters DRP pairing configuration mode.
location (SDR)	Assigns a node to a secure domain router.

show sdr

To display information about the currently defined secure domain routers (SDRs), use the **show sdr** command in the appropriate configuration mode.

SysAdmin EXEC

show sdr [**name** *sdr-name* [**detail**]| **summary**]

XR EXEC

show sdr [**detail**]

Syntax Description

name <i>sdr-name</i>	Specifies a specific SDR.
detail	Displays more detailed information for a specific SDR.
summary	Displays summary information about all SDRs in the system.

Command Default

Administration EXEC mode:

- Displays information for the Owner SDR.
- If you are logged into a specific SDR as the admin user, then information about the local SDR is displayed.

EXEC mode:

- Displays information about the local SDR.

Command Modes

XR EXEC

System Admin 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 sdr** command in administration EXEC mode to display the inventory of nodes in the Owner SDR or in a specific named SDR. The **show sdr** command in EXEC mode displays the inventory of nodes in the current SDR.

Task ID

Task ID	Operations
system	read

Examples

This example shows sample output from the **show sdr** command in XR EXEC

mode:

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

```
SDR Inventory -----
Type      NodeName      NodeState      RedState      PartnerName
-----
LC (2)    0/1/CPU0      IOS XR RUN      NONE          NONE
DRP (1)   0/4/CPU0      IOS XR RUN      Active        NONE
DRP (1)   0/4/CPU1      IOS XR RUN      Active        NONE
LC (2)    0/6/CPU0      IOS XR RUN      NONE          NONE
RP (0)    0/RP0/CPU0    IOS XR RUN      Active        0/RP1/CPU0
RP (0)    0/RP1/CPU0    IOS XR RUN      Standby       0/RP0/CPU0
```

Table 45: show sdr Field Descriptions

Field	Description
Type	Type of card, which can be Linecard, RP, or DRP.
NodeName	Name of the node, expressed in the <i>rack/slot/module</i> notation.
NodeState	Run state of the card, which can be failure, present, booting, running, and so on.
RedState	Redundancy state of the card, which can be active, standby, or none.
PartnerName	Partner of the card, expressed in the <i>rack/slot/module</i> notation.

This example shows sample output from the **show sdr** command in System Admin EXEC

mode with the **summary** keyword:

```
sysadmin-vm:0_RP1 # show sdr
location 0/RP1
sdr-id    2
IP Address of VM 192.0.4.4
```

```

MAC address of VM E0:50:07:FA:8F:06
VM State          RUNNING
start-time        2013-11-12T23:46:23.914217+00:00
Last Reload Reason CARD_SHUTDOWN
Reboot Count      1
location 0/5
sdr-id            2
IP Address of VM  192.0.84.3
MAC address of VM E0:51:1A:A6:34:05
VM State          RUNNING
start-time        2011-01-01T00:03:10.024794+00:00
Last Reload Reason CARD_SHUTDOWN
Reboot Count      1

```

Table 46: show sdr summary Field Descriptions

Field	Description
SDRid	Identifier of the SDR.
dSDRSC	Designated secure domain router shelf controller. This refers to the controller of the SDR.
StbydSDRSC	Standby DSDRSC. This refers to the standby controller of the SDR.
Primary1	Configured primary node.
Primary2	Configured primary node pair.
MacAddr	MAC address associated with the SDR.



SNMP Server Commands on

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*.

- [add \(bulkstat object\), page 422](#)
- [buffer-size, page 424](#)
- [clear snmp counters, page 425](#)
- [enable \(bulkstat\), page 427](#)
- [format \(bulkstat\), page 429](#)
- [index persistence, page 431](#)
- [instance \(bulkstat schema\), page 433](#)
- [instance range, page 435](#)
- [instance repetition, page 437](#)
- [notification linkupdown, page 439](#)
- [object-list, page 441](#)
- [poll-interval, page 443](#)
- [retain, page 445](#)
- [retry, page 447](#)
- [schema, page 449](#)

- [show snmp](#), page 451
- [show snmp context](#), page 454
- [show snmp context-mapping](#), page 456
- [show snmp engineid](#), page 458
- [show snmp entity](#), page 460
- [show snmp group](#), page 462
- [show snmp host](#), page 464
- [show snmp interface](#), page 466
- [show snmp interface notification](#), page 468
- [show snmp interface regular-expression](#), page 470
- [show snmp mib](#), page 472
- [show snmp mib bulkstat transfer](#), page 475
- [show snmp request duplicates](#), page 477
- [show snmp users](#), page 478
- [show snmp view](#), page 480
- [snmp-server chassis-id](#), page 482
- [snmp-server community](#), page 484
- [snmp-server community-map](#), page 487
- [snmp-server contact](#), page 489
- [snmp-server context](#), page 491
- [snmp-server context mapping](#), page 493
- [snmp-server engineid local](#), page 495
- [snmp-server engineid remote](#), page 497
- [snmp-server entityindex persist](#), page 499
- [snmp-server group](#), page 500
- [snmp-server host](#), page 503
- [snmp-server location](#), page 507
- [snmp-server mib bulkstat max-procmem-size](#), page 509
- [snmp-server mib bulkstat object-list](#), page 510
- [snmp-server mib bulkstat schema](#), page 512
- [snmp-server mib bulkstat transfer-id](#), page 514
- [snmp-server notification-log-mib](#), page 516
- [snmp-server packetsize](#), page 518

- [snmp-server queue-length, page 519](#)
- [snmp-server target list, page 521](#)
- [snmp-server throttle-time, page 523](#)
- [snmp-server timeouts subagent, page 525](#)
- [snmp-server trap authentication vrf disable, page 526](#)
- [snmp-server trap link ietf, page 527](#)
- [snmp-server trap throttle-time, page 529](#)
- [snmp-server traps, page 531](#)
- [snmp-server traps snmp, page 538](#)
- [snmp-server traps syslog, page 541](#)
- [snmp-server trap-source, page 543](#)
- [snmp-server trap-timeout, page 545](#)
- [snmp-server user, page 547](#)
- [snmp-server view, page 550](#)
- [snmp-server vrf, page 552](#)
- [snmp test trap all, page 555](#)
- [snmp test trap entity, page 557](#)
- [snmp test trap infra, page 559](#)
- [snmp test trap interface, page 561](#)
- [snmp test trap snmp, page 563](#)
- [transfer-interval, page 564](#)
- [url, page 566](#)

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 add** form of this command.

add {*object-name*| *OID*}

no add {*object-name*| *OID*}

Syntax Description

<i>object-name</i>	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.
<i>OID</i>	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

Examples

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 Commands

Command	Description
show snmp mib	Displays a list of MIB module object identifiers registered on the system.

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

<i>bytes</i>	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

Examples

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

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

Examples The following example shows how to clear the SNMP counters:

```
RP/0/RP0/CPU0:router# clear snmp counters
```

 clear snmp counters**Related Commands**

Command	Description
show snmp	Displays the status of SNMP communications

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.

Task ID	Task ID	Operation
	snmp	read, write

Examples

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 Commands

Command	Description
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
snmp-server mib bulkstat transfer-id	Identifies the bulk statistics transfer configuration and enters bulk statistics transfer configuration mode.

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 format** 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

Examples

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 Commands

Command	Description
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
snmp-server mib bulkstat transfer-id	Identifies the bulk statistics transfer configuration and enters bulk statistics transfer configuration mode.

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

Examples The following example shows how to assign ifIndex persistence on Packet-over-SONET/SDH (POS) interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface pos 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)# index persistence
```

Related Commands

Command	Description
show snmp interface	Displays the interface index identification numbers (ifIndex values) for all the interfaces or a specified interface.
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server ifindex persist	Enables ifIndex persistence globally on all SNMP interfaces.
snmp-server interface	Enables an interface to send SNMP trap notifications and enters SNMP interface configuration mode.

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 <i>interface-id</i>	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 <i>oid</i>	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 (for example, gigabitethernet 0/6/5/0) 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

Examples

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 Commands

Command	Description
instance range	Specifies a range of instances for objects in a schema.
instance repetition	Configures bulk statistics data collection to begin at a particular instance of a MIB object and to repeat for a given number of instances.
snmp-server mib bulkstat schema	Configures an SNMP bulk statistics schema and enters bulk statistics schema configuration mode.

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 <i>start-oid</i>	Specifies the first OID value of a range of values.
end <i>end-oid</i>	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

Examples

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 Commands

Command	Description
instance (bulkstat schema)	Configures the MIB object instances to be used in a bulk statistics schema.
snmp-server mib bulkstat schema	Configures an SNMP bulk statistics schema and enters bulk statistics schema configuration mode.

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

<i>oid-instance</i>	Object ID of the instance to be monitored.
max <i>repeat-number</i>	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

Examples

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 Commands

Command	Description
instance (bulkstat schema)	Configures the MIB object instances to be used in a bulk statistics schema.
instance range	Specifies a range of instances for objects in a schema.
snmp-server mib bulkstat schema	Configures an SNMP bulk statistics schema and enters bulk statistics schema configuration mode.

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

Examples

The following example shows how to disable linkUp and linkDown trap notifications on Packet-over-SONET/SDH (POS) interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface pos 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)# notification linkupdown disable
```

Related Commands

Command	Description
show snmp interface	Displays the interface index identification numbers (ifIndex values) for all the interfaces or a specified interface.
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server ifindex persist	Enables ifIndex persistence globally on all SNMP interfaces.
snmp-server interface	Enables an interface to send SNMP trap notifications and enters SNMP interface configuration mode.
snmp-server interface subset	Enters snmp-server interface mode for a subset of interfaces.
snmp-server traps snmp	Enables the sending of RFC 1157 SNMP notifications.

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

<i>list-name</i>	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

Examples

```
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 Commands

Command	Description
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
snmp-server mib bulkstat schema	Configures an SNMP bulk statistics schema and enters bulk statistics schema configuration mode.
snmp-server mib bulkstat object-list	Configures an SNMP bulk statistics object list and enters bulk statistics objects configuration mode.

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

<i>minutes</i>	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

Examples

In this example, the polling interval for bulk statistics collection is set to once every 3 minutes in the schema called GigE2/1-CAR:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# snmp-server mib bulk schema GigE2/1-CAR
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 3
```

Related Commands

Command	Description
snmp-server mib bulkstat schema	Configures an SNMP bulk statistics schema and enters bulk statistics schema configuration mode.

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

<i>minutes</i>	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

Examples

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 Commands

Command	Description
retry	Configures the number of retries that should be attempted for a bulk statistics file transfer.
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
snmp-server mib bulkstat transfer-id	Identifies the bulk statistics transfer configuration and enters bulk statistics transfer configuration mode.

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

<i>number</i>	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

Examples

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:pswrld@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 Commands

Command	Description
retain	Configures the retention interval for bulk statistics files.
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
snmp-server mib bulkstat transfer-id	Identifies the bulk statistics transfer configuration and enters bulk statistics transfer configuration mode.

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

<i>schema-name</i>	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

Examples

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 Commands

Command	Description
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
snmp-server mib bulkstat schema	Configures an SNMP bulk statistics schema and enters bulk statistics schema configuration mode.

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

Examples

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 47: [show snmp Field Descriptions](#), on page 452 describes the significant fields shown in the display.

Table 47: 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.

Field	Description
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.
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 Commands

Command	Description
show snmp mib	Displays a list of MIB module object identifiers registered on the system.
snmp-server chassis-id	Provides a message line identifying the SNMP server serial number.
snmp-server queue-length	Establishes the message queue length for each trap host for SNMP.

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	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 4.2.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 4.2.0	This command was introduced.
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	<table> <tr> <th>Task ID</th><th>Operation</th></tr> <tr> <td>snmp</td><td>read</td></tr> </table>	Task ID	Operation	snmp	read
Task ID	Operation				
snmp	read				

Examples

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 Commands

Command	Description
snmp-server context mapping	Maps an SNMP context with a protocol instance, topology or VRF entity.

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

Examples 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 48: 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 and all remote engines that have 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
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.

An *SNMP engine* is a copy of SNMP that can reside on a local device.

Task ID	Task ID	Operations
	snmp	read

Examples The following example shows sample output from the **show snmp engineid** command:

```
RP/0/RP0/CPU0:router# show snmp engineid
Local SNMP engineID: 00000009020000000C025808
```

Related Commands

Command	Description
snmp-server engineid local	Specifies an SNMP engine ID on the local device.

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

Examples 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

Examples 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 : vldefault writeview: -
notifyview: vldefault
row status: nonVolatile

groupname: public security model:snmpv2c
readview : vldefault writeview: -
notifyview: vldefault
row status: nonVolatile
```

Table 49: 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 Commands

Command	Description
snmp-server group	Configures a new SNMP group, or a table that maps SNMP users to SNMP views.

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

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	Operations
snmp	read

Examples 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 50: 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 interface

To display the interface index identification numbers (ifIndex values) for all the interfaces or a specified interface, use the **show snmp interface** command in EXEC or XR EXEC mode.

show snmp interface [*type interface-path-id ifindex*]

Syntax Description

<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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.
ifindex	(Optional) Displays the ifIndex value for the specified interface.

Command Default

Enter the **show snmp interface** command without keywords or arguments to display the ifIndex value for all interfaces.

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

Examples

This example displays the ifIndex value for a specific interface:

```
RP/0/RP0/CPU0:router# show snmp interface pos 0/1/0/1 ifindex
ifName : POS0/1/0/1          ifIndex : 12
```

The following example displays the ifIndex value for all interfaces:

```
RP/0/RP0/CPU0:router# show snmp interface

ifName : Loopback0          ifIndex : 1
ifName : POS0/1/0/1         ifIndex : 12
ifName : POS0/1/4/2         ifIndex : 14
ifName : POS0/1/4/3         ifIndex : 15
ifName : POS0/6/0/1         ifIndex : 2
ifName : POS0/6/4/4         ifIndex : 18
ifName : POS0/6/4/5         ifIndex : 19
ifName : POS0/6/4/6         ifIndex : 20
ifName : Bundle-POS24       ifIndex : 4
ifName : Bundle-Ether28     ifIndex : 5
ifName : Bundle-Ether28.1   ifIndex : 7
ifName : Bundle-Ether28.2   ifIndex : 8
ifName : Bundle-Ether28.3   ifIndex : 9
ifName : MgmtEth0/RP0/CPU0/0 ifIndex : 6
ifName : MgmtEth0/RP1/CPU0/0 ifIndex : 10
ifName : GigabitEthernet0/1/5/0 ifIndex : 11
ifName : GigabitEthernet0/1/5/1 ifIndex : 13
ifName : GigabitEthernet0/1/5/2 ifIndex : 3
ifName : GigabitEthernet0/6/5/1 ifIndex : 16
ifName : GigabitEthernet0/6/5/2 ifIndex : 17
ifName : GigabitEthernet0/6/5/7 ifIndex : 21
```

Table 51: show snmp interface Field Descriptions

Field	Definition
ifName	Interface name.
ifIndex	ifIndex value.

Related Commands

Command	Description
snmp-server ifindex persist	Enables ifIndex persistence globally on all SNMP interfaces.
snmp-server interface	Enables an interface to send SNMP trap notifications and enters SNMP interface configuration mode.

show snmp interface notification

To display the linkUp and linkDown notification status for a subset of interfaces, use the **show snmp interface notification** command in EXEC mode.

```
show snmp interface notification {subset subset-number| regular-expression expression} [type interface-path-id]}
```

Syntax Description

subset <i>subset-number</i>	Specifies the identifier of the interface subset. The subset-number argument is configured using the snmp-server interface subset command.
regular-expression <i>expression</i>	Specifies a subset of interfaces matching a regular expression, for which to display information.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(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

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	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.

Regular expressions have two constraints:

- Regular expressions must always be entered within double quotes to ensure that the CLI interprets each character correctly.
- All characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash

character "\". For example, to enter the regular expression `([A-Z][A-Z0-9]*)b[^>]*>(.*)</\1`, you would enter `([A-Z][A-Z0-9]*)\\b[^>]*>(.*)</\1`.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in for more information regarding regular expressions.

When using the **subset** or **regular-expression** keywords, the actual display might not match the configuration if there are higher priority *subset-number* values that actually apply to the interface. This can happen for a set of interfaces that are included in two or more configured regular expressions or where an individual interface configuration is enabled.

Task ID

Task ID	Operation
snmp	read

Examples

The following example illustrates how to display linkUp and linkDown notification status for a subset of interfaces identified by a specific *subset-number*:

```
RP/0/RP0/CPU0:router# show snmp interface notification subset 3
```

This example illustrates how to display linkUp and linkDown notification status for a subset of interfaces identified by a regular expression:

```
RP/0/RP0/CPU0:router# show snmp interface notification regular-expression  
"^Gig[a-zA-Z]+[0-9/]+\."
```

show snmp interface regular-expression

To display interface names and indices assigned to interfaces that match a regular expression, use the **show snmp interface regular-expression** command in EXEC mode.

show snmp interface regular-expression *expression*

Syntax Description

<i>expression</i>	Specifies a subset of interfaces matching a regular expression, for which to display information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	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 characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash character "\." For example, to enter the regular expression ([A-Z][A-Z0-9]*)\b[^>]*>(.*)<\1, you would enter ([A-Z][A-Z0-9]*)\b[^>]*>(.*)<\1.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in for more information regarding regular expressions.

Task ID

Task ID	Operation
snmp	read

Examples

This example illustrates how to display information for interfaces that match the given regular expression:

```
RP/0/RP0/CPU0:router# show snmp interface regular-expression "^Gig[a-zA-Z]+[0-9/]+\."
```

Related Commands

Command	Description
snmp-server interface subset	Enters snmp-server interface mode for a subset of interfaces.

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 or XR EXEC mode.

show snmp mib [*object-name*] **dll**

Syntax Description

<i>object-name</i>	(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 **Ctrl-Z**.

Task ID

Task ID	Operations
snmp	read

Examples

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
mplslpdmib:dll=/pkg/lib/mib/libmplslpdmib.dll, config=mplsldp.mib,
  loaded
.
.
.

```

Related Commands

Command	Description
show snmp	Displays the status of SNMP communications

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	<i>transfer-name</i> 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

Examples

```
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

Examples 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 Modes

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

Examples

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 52: 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 Commands

Command	Description
snmp-server group	Configures a new SNMP group, or a table that maps SNMP users to SNMP views.
snmp-server user	Configures a new user to an SNMP group.

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

Examples 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 Commands

Command	Description
snmp-server group	Configures a new SNMP group, or a table that maps SNMP users to SNMP views.
snmp-server user	Configures a new user to an SNMP group.

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

<i>serial-number</i>	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

Examples

The following example shows how to specify the chassis serial number 1234456:

```
RP/0/RP0/CPU0:router# snmp-server chassis-id 1234456
```

Related Commands

Command	Description
show snmp	Displays the status of SNMP communications

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 <i>community-string</i> is clear text and should be encrypted when displayed by the show running command.
encrypted	(Optional) Specifies that the entered <i>community-string</i> is encrypted text and should be displayed as such by the show running command.
<i>community-string</i>	Community string that acts like a password and permits access to the SNMP protocol. The maximum length of the <i>community-string</i> argument is 32 alphabetic characters. If the clear keyword was used, <i>community-string</i> is assumed to be clear text. If the encrypted keyword was used, <i>community-string</i> is assumed to be encrypted. If neither was used, <i>community-string</i> is assumed to be clear text.
view <i>view-name</i>	(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.
<i>access-list-name</i>	(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 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

Examples

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 Commands

Command	Description
snmp-server view	Creates or updates an SNMP view entry.

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 <i>community-string</i> argument is clear text.
encrypted	(Optional) Specifies that the <i>community-string</i> argument is encrypted text.
<i>community-string</i>	Name of the community.
context <i>context-name</i>	(Optional) Name of the SNMP context to which this community name is to be mapped.
security-name <i>security-name</i>	(Optional) Security name for this community. By default, the <i>string</i> is the security name.
target-list <i>target</i>	(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

Examples

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 Commands

Command	Description
snmp-server context	Creates a Simple Network Management Protocol (SNMP) context.
snmp-server target list	Creates an SNMP target list.

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

<i>system-contact-string</i>	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

Examples

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 Commands

Command	Description
snmp-server location	Specifies the system location for SNMP.

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

<i>context-name</i>	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 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 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

Examples

This example creates a new SNMP context named "sample1."

```
RP/0/RP0/CPU0:router(config)# snmp-server context sample1
```

Related Commands

Command	Description
snmp-server community-map	Associates an SNMP community with an SNMP context, security name, or a target-list.
snmp-server vrf	Configures the VPN routing and forwarding (VRF) properties of SNMP.

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

<i>context-name</i>	Name of the SNMP context.
feature <i>feature-name</i>	Specifies the protocol for which to map the context. Available options are: • bridge—Layer 2 VPN bridge • vrf—Virtual Routing and Forwarding
instance <i>instance-name</i>	Maps the context to the specified protocol instance.
topology <i>topology-name</i>	Maps the context to the specified protocol topology.
vrf <i>vrf-name</i>	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

Examples

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 Commands

Command	Description
snmp context (OSPF)	Specifies SNMP context for an OSPF instance.
snmp context (OSPFv3)	Specifies SNMP context for an OSPFv3 instance.
show snmp context	Displays the enhanced SNMP context mappings.

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

<i>engine-id</i>	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

Examples

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 Commands

Command	Description
show snmp engineid	Displays the identification of the local Simple Network Management Protocol (SNMP) engine and all remote engines that have been configured on the router.

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

<i>ip-address</i>	IP address of remote SNMP notification host
<i>engine-id</i>	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 <i>port</i>	(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

Examples

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 Commands

Command	Description
show snmp engineid	Displays the identification of the local Simple Network Management Protocol (SNMP) engine and all remote engines that have been configured on the router.
snmp-server engineid local	Specifies an SNMP engine ID on the local device.

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

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	Operation
snmp	read, write

Examples This example illustrates how to enable persistent storage of ENTITY-MIB indices:

```
RP/0/RP0/CPU0:router(config)# snmp-server entityindex persist
```

Related Commands	Command	Description
	snmp-server mibs cbqosmib persist	Enables persistent storage of CISCO-CLASS-BASED-QOS-MIB data.

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

<i>name</i>	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 <i>view</i>	(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 <i>view</i>	(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 <i>view</i>	(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 <i>context-name</i>	(Optional) Specifies the SNMP context to associate with this SNMP group and associated views.
<i>access-list-name</i>	(Optional) Access list string (not to exceed 64 characters) that is the name of the access list.

Command Default

See [Table 53: snmp-server group Default Descriptions](#), on page 501.

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.

This table describes the default values for the different views:

Table 53: snmp-server group Default Descriptions

Default	Definition
read <i>view</i>	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 <i>view</i>	Nothing is defined for the write view (that is, the null OID). You must configure write access.
notify <i>view</i>	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

Examples

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 Commands

Command	Description
show snmp	Displays the status of SNMP communications
show snmp group	Displays the names of groups on the router, security model, status of the different views, and storage type of each group.
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.
snmp-server view	Creates or updates an SNMP view entry.

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

<i>address</i>	Name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the <i>community-string</i> argument is clear text.
encrypted	(Optional) Specifies that the <i>community-string</i> 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").
<i>community-string</i>	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 <i>port</i>	(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	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.

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

Examples

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 Commands

Command	Description
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server inform	Configures SNMP inform message options.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.

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

<i>system-location</i>	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

Examples

This example shows how to specify a system location string:

```
RP/0/RP0/CPU0:router(config)# snmp-server location Building 3/Room 214
```

Related Commands

Command	Description
snmp-server contact	Sets the SNMP system contact.

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

<i>size</i>	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

Examples

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

Examples

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 Commands

Command	Description
add (bulkstat object)	Adds a MIB object to an SNMP bulk statistics object list.
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.

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

<i>schema-name</i>	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

Examples

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 GigE0/6/5/0
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 gigabitethernet 0/6/5/0 subif
RP/0/RP0/CPU0:router(config-bulk-sc)# exit
```

Related Commands

Command	Description
instance (bulkstat schema)	Configures the MIB object instances to be used in a bulk statistics schema.
poll-interval	Configures the polling interval for a bulk statistics schema.

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

Examples

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 Commands

Command	Description
buffer-size	Configures a maximum buffer size for the transfer of bulk statistics files.
format (bulkstat)	Specifies the format to be used for the bulk statistics data file.
retain	Configures the retention interval for bulk statistics files.
retry	Configures the number of retries that should be attempted for a bulk statistics file transfer.
schema	Specifies the bulk statistics schema to be used in a specific bulk statistics transfer configuration.
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
transfer-interval	Configures how long bulk statistics should be collected before a bulk statistics transfer is initiated.
url	Specifies the host to which bulk statistics files should be transferred.

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 <i>time</i>	Specifies how much time, in minutes, a notification remains in the log. Values for the <i>time</i> argument can range from 0 to 4294967295; the default is 15.
globalSize <i>size</i>	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 <i>size</i>	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

Examples

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 Commands

Command	Description
snmp-server community-map	Associates an SNMP community with an SNMP context, security name, or a target-list.

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

<i>size</i>	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

Examples

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

Examples

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

<i>target-list</i>	Name of the target list.
vrf <i>vrf-name</i>	Specifies the name of the VRF hosts included in the target list.
host <i>hostname</i>	Assigns a hostname to the target list. The <i>hostname</i> 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

Examples

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 Commands

Command	Description
snmp-server community-map	Associates an SNMP community with an SNMP context, security name, or a target-list.

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

<i>time</i>	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

Examples

In the following example, the throttle time is set to 500 milliseconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server throttle-time 500
```

Related Commands

Command	Description
snmp-server community-map	Associates an SNMP community with an SNMP context, security name, or a target-list.

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

<i>timeout</i>	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

Examples

In the following example, the timeout is set to 8 seconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server timeouts subagent 8
```

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

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	Operation
snmp	read, write

Examples This example illustrates how to disable authentication traps on VPNs:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap authentication vrf disable
```

Command	Description
snmp-server vrf	Configures the VPN routing and forwarding (VRF) properties of SNMP.

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

Examples This example shows how to enable the RFC 2863 standard varbind:

```
RP/0/RP0/CPU0:router# snmp-server trap link ietf
```

Related Commands

Command	Description
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables the sending of RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications of Cisco-syslog-MIB error messages.

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	<i>time</i>	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

Examples	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 Commands

Command	Description
snmp-server throttle-time	Specifies the throttle time for handling incoming SNMP messages.

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 fr	mpls-ldp	read, write
	mpls-te	read, write
mpls l3vpn	ipv4	read, write
	mpls-ldp	read, write
	mpls-te	read, write

Notification Type	Task ID	Operations
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

Examples

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 Commands

Command	Description
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables the sending of RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications of Cisco-syslog-MIB error messages.

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 SNMPv2c, 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 window of the authoritative SNMP engine.

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

Examples

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 Commands

Command	Description
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.

Command	Description
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications of Cisco-syslog-MIB error messages.

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

Examples 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 Commands

Command	Description
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables the sending of RFC 1157 SNMP notifications.

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

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	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

Examples

The following example shows how to specify that the IP address for Packet-over-SONET/SDH (POS) interface 0/0/1/0 is the source for all SNMP notifications:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap-source POS 0/0/1/0
```

Related Commands

Command	Description
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables the sending of RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications of Cisco-syslog-MIB error messages.

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

<i>seconds</i>	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

Examples

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 Commands

Command	Description
snmp-server engineid local	Specifies an SNMP engine ID on the local device.
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables the sending of RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications of Cisco-syslog-MIB error messages.

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

<i>username</i>	Name of the user on the host that connects to the agent.
<i>groupname</i>	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.
<i>auth-password</i>	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.

<i>priv-password</i>	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.
<i>access-list-name</i>	(Optional) Access list to be associated with this SNMP user. The <i>access-list-name</i> 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 54: snmp-server user Default Descriptions](#), on page 548.

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*.

Table 54: 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

Examples

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 Commands

Command	Description
snmp-server group	Configures a new SNMP group, or a table that maps SNMP users to SNMP views.

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

<i>view-name</i>	Label for the view record being updated or created. The name is used to reference the record.
<i>oid-tree</i>	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 <i>system</i> . 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

Examples

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 Commands

Command	Description
show snmp view	Displays the configured views and the associated MIB view family name, storage type, and status.
snmp-server group	Configures a new SNMP group, or a table that maps SNMP users to SNMP views.

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

XR Config

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

<i>vrf-name</i>	Name of the VRF.
host <i>address</i>	(Optional) Specifies the name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the <i>community-string</i> argument is clear text.
encrypted	(Optional) Specifies that the <i>community-string</i> 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
<i>security-level</i>	(Optional) Security level for SNMPv3. Options are: • auth—authNoPriv • noauth—noAuthNoPriv • priv—authPriv
<i>community-string</i>	Specifies the community string for SNMPv1 and SNMPv2, or the SNMPv3 user.
udp-port <i>port</i>	(Optional) Specifies the UDP port to which notifications should be sent.
context <i>context-name</i>	(Optional) Name of the context that must be mapped to VRF identified by value of the <i>vrf-name</i> 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

Examples

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 Commands

Command	Description
snmp-server context	Creates a Simple Network Management Protocol (SNMP) context.
snmp-server host	Specifies the recipient of a Simple Network Management Protocol (SNMP) notification operation.

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

Examples This example illustrates how to use the **snmp test trap all** command:

```
RP/0/RP0/CPU0:router# snmp test trap all
```

Related Commands	Command	Description
	show snmp entity	Displays the entPhysicalName and entPhysicalIndex mappings.

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 <i>index</i>	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

Examples

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 Commands

Command	Description
show snmp entity	Displays the entPhysicalName and entPhysicalIndex mappings.

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

Examples

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 <i>index</i>	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

Examples

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

Examples

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

<i>minutes</i>	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

Examples

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 Commands

Command	Description
enable (bulkstat)	Begins the bulk statistics data collection and transfer process for a specific bulk statistics configuration.
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.
snmp-server mib bulkstat transfer-id	Identifies the bulk statistics transfer configuration and enters bulk statistics transfer configuration mode.

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.
<i>url</i>	Destination URL address for the bulk statistics file transfer. Use FTP or TFTP. The syntax for these URLs is as follows: • ftp:<i>[[[/username[:password]@]location]/directory]/filename</i> • tftp:<i>[[/location]/directory]/filename</i> 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

Examples

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 Commands

Command	Description
show snmp mib bulkstat transfer	Displays completed local bulk statistics files.



Software Package Management Commands on

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 abort, page 570](#)
- [install activate, page 572](#)
- [install add, page 574](#)
- [install attach, page 576](#)
- [install auto-abort-timer stop, page 579](#)
- [install commit, page 581](#)
- [install deactivate, page 583](#)
- [install label, page 585](#)
- [install remove, page 588](#)
- [install rollback to, page 590](#)
- [install verify healthcheck, page 594](#)
- [show install active, page 597](#)
- [show install inactive, page 599](#)
- [show install log, page 601](#)
- [show install package, page 603](#)
- [show install request, page 605](#)

install abort

To abort an installation transaction, use the **install abort** command in administration EXEC mode.

install abort [*request-id*]

Syntax Description

<i>request-id</i>	(Optional) Request ID assigned to an installation operation.

Command Default

Abort the current installation operation.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 4.0.0	This command was removed from EXEC mode.

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 abort** command to halt a software installation operation that is in process or that has been suspended.

Only activation, deactivation, and rollback operations can be aborted. Specifically, the **install abort** command cannot be aborted, but the **install add** command with the **activate** keyword can be aborted.

Use the **install abort** command with the *request-id* argument to halt a specific installation operation if the *request-id* is currently in process.

Task ID

Task ID	Operations
pkg-mgmt	read, write

Examples

The following example shows how to halt an installation operation:

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

Info: Please confirm your 'install abort' request by pressing Enter or y, or pressing n to

```
cancel it.  
Do you really want to abort install operation 15? [confirm] <enter>  
Abort confirmed.  
Please check console to verify the operation is aborted.
```

Related Commands

Command	Description
install activate	Adds software functionality to the active software set.
install add	Adds the contents of an ISO image, package, and SMUs to the software repository.
install deactivate	Removes a package from the active software set.

install activate

To add software functionality to the active software set, use the **install activate** command in System Admin EXEC or XR EXEC mode.

install activate *{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 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.

Command Default

The **install activate** command can be executed without any keywords if the **install prepare** is already executed. If the **install prepare** command was not executed prior to **install activate**, executing the **install activate** command without any keywords aborts the process.

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 **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

Examples

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 Commands

Command	Description
install add	Adds the contents of an ISO image, package, and SMUs to the software repository.
install commit	Makes the current active software set persistent across RP reloads.
install deactivate	Removes a package from the active software set.

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 or XR EXEC mode.

install add *source source-path package-name*

Syntax Description

source <i>source</i>	Specifies the source location of the packages to be appended to the package names.
<i>package name</i>	Enter the package name(s) separated by space. Example: tftp://server/directory/ file1 file2 file3 • tftp://hostname or ip-address/directory-path

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

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 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 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

Examples

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 Commands

Command	Description
install activate	Adds software functionality to the active software set.
install commit	Makes the current active software set persistent across RP reloads.
show install log	Displays the entries stored in the logging installation buffer.
show install request	Displays the list of incomplete installation manager requests.

install attach

To attach a terminal to an installation operation, use the **install attach** command in administration EXEC configuration mode.

install attach [*request-id*] [**asynchronous**|**synchronous**]

Syntax Description

<i>request-id</i>	(Optional) Request ID assigned to an installation operation.
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 command operates in synchronous mode.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 4.0.0	This command was removed from EXEC mode.

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 attach** command to attach a terminal to an installation operation. This is similar to making the installation operation synchronous, and is used for the following reasons:

- To change an asynchronous installation operation to a synchronous installation operation.
- The installation operation is asynchronous but the terminal that ran the command has been lost (due to a switchover or terminal timeout).

**Note**

An asynchronous operation runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode. A synchronous operation allows the installation process to finish before the prompt is returned.

Task ID

Task ID	Operations
pkg-mgmt	read, write

Examples

The following example, a software package is activated in asynchronous mode. In asynchronous mode, the command runs in the background, and the CLI prompt is returned as soon as possible.

Use the **install attach** command to attach the terminal to an installation operation. This switches the operation to synchronous mode, which allows the installation process to finish before the prompt is returned.

In the following example, the **install activate** command is entered in asynchronous mode. The CLI prompt returns before the operation is complete.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install activate
disk0:-mcast-3.7.6
```

```
Install operation 14 'install activate
disk0:RP/0/RP0/CPU0:router-mcast-3.7.6'
started by user 'user_b' at 08:04:31 UTC Mon Nov 14 2005.
The install operation will continue asynchronously.
```

```
RP/0/0/CPU0:router(admin)#
Info: SDR Owner: Checking running configuration version compatibility with
Info: newly activated software ...
Info: SDR Owner: No incompatibilities found between the activated software
Info: and router running configuration.
```

In the following example, the **install attach** command is used to attach the terminal to the installation operation and complete the operation in synchronous mode. The CLI prompt is returned only after the installation operation is complete.

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

```
Install operation 14 'install activate
disk0:-mcast-3.7.6'
started by user 'user_b' at 08:04:31 UTC Mon Nov 14 2005.
Info: SDR Owner: Checking running configuration version compatibility with
Info: newly activated software ...
Info: SDR Owner: No incompatibilities found between the activated software
Info: and router running configuration.
Info: The changes made to software configurations will not be persistent
Info: across system reloads. Use the command 'admin install commit' to make
Info: changes persistent.
Info: Please verify that the system is consistent following the software
Info: change using the following commands:
Info: show system verify
Info: install verify
```

```
The currently active software is not committed. If the system reboots
then the committed software will be used. Use 'install commit' to commit
the active software.
```

Install operation 14 completed successfully at 08:06:12 UTC Mon Nov 14 2005.

Related Commands

Command	Description
install activate	Adds software functionality to the active software set.
install add	Adds the contents of an ISO image, package, and SMUs to the software repository.
install deactivate	Removes a package from the active software set.

install auto-abort-timer stop

To deactivate the auto-abort-timer that is set in the **install activate** or **install deactivate** commands, use the **install auto-abort-timer stop** command in administration EXEC mode.

install auto-abort-timer stop

Syntax Description This command has no keywords or arguments.

Command Default When activated, the auto-abort-timer runs to expiration and then loads the last committed loadpath.

Command Modes Administration EXEC

Command History	Release	Modification
	Release 3.9.0	No modification.
	Release 4.0.0	This command was removed from EXEC mode.

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 auto-abort-timer stop** command to halt the auto-abort-timer that was activated with the **install activate** or **install deactivate** command. Alternatively, you can use the **install commit** command to halt the timer.

If you do not halt the auto-abort-timer, the software loads to the last committed loadpath when the timer expires. If the software has installed successfully, and you intend to continue using the new software, you should disable the auto-abort-timer.

Task ID	Task ID	Operations
	pkg-mgmt	read, write

Examples The following example shows how to halt the auto-abort-timer:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install auto-abort-timer stop
```

Related Commands

Command	Description
install activate	Adds software functionality to the active software set.
install commit	Makes the current active software set persistent across RP reloads.
install deactivate	Removes a package from the active software set.

install commit

To save the active software set to be persistent across designated system controller (DSC) reloads, use the **install commit** command in administration EXEC mode.

install commit [*location node-id*]

Syntax Description

location node-id	(Optional. Administration EXEC mode only.) Specifies a node. The <i>node-id</i> argument is expressed in <i>rack/slot</i> notation.

Command Default

Administration EXEC Mode: Commits the active software set for all SDRs.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 4.0.0	This command was removed from EXEC mode. Support for the sdr keyword was reomoved.

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 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

Examples

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 Commands

Command	Description
show install log	Displays the entries stored in the logging installation buffer.

install deactivate

To remove a package from the active software set, use the **install deactivate** command in System Admin EXEC or XR EXEC mode.

install deactivate *{package| id add-id}*

Syntax Description

<i>package</i>	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.
<i>id add-id</i>	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.

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
XR EXEC

Command History

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

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

Examples

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 Commands

Command	Description
install activate	Adds software functionality to the active software set.
install commit	Makes the current active software set persistent across RP reloads.
install remove	Deletes inactive packages from the software repository.
show install inactive	Displays inactive packages in the active software set.
show install log	Displays the entries stored in the logging installation buffer.
show install request	Displays the list of incomplete installation manager requests.

install label

To add a label or description to a state associated with a rollback point, use the **install label** command in administration EXEC mode.

install label *point-id* {**description** *description*| **label-name** *label*}

Syntax Description

<i>point-id</i>	Installation point ID number.
description <i>description</i>	Specifies a description for the specified rollback point.
label-name <i>label</i>	Specifies a label for the specified rollback point.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.0	No modification.
Release 4.0.0	This command was removed from EXEC mode.

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 label** command to put a label and description on an installation rollback point that can be used to identify the rollback point in other commands. Commands that support the rollback label include:

- **clear install rollback**
- **install rollback**
- **show install rollback**

The label can be a maximum of 15 characters which must adhere to the following rules:

- No white-space
- Cannot include any of the following CLI keywords:
 - **active**
 - **all**

- asynchronous
- brief
- committed
- description
- detail
- differences
- from
- force
- inactive
- install
- label
- label-name
- location
- noprompt
- rollback
- sdr
- summary
- synchronous
- test
- to
- verbose

- Cannot contain any of the following characters:

- Comma (,)
- Semi-colon (;)
- Colon (:)
- Single-quote (')
- Double-quote ("")

- Cannot contain uppercase alphabetic characters
- Cannot contain numeric characters only

Task ID

Task ID	Operations
pkg-mgmt	read, write

Examples

The following example shows how to define a label for an installation operation:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install label 0 label-name brians-smu

Install operation 5 'install label 0 label-name brians_smu' started by user
'user' on SDR Owner via CLI at 09:26:43 DST Thu Aug 09 2007.
Install operation 5 completed successfully at 09:26:44 DST Thu Aug 09 2007.
```

Related Commands

Command	Description
install activate	Adds software functionality to the active software set.

install remove

To delete inactive packages from the software repository, use the **install remove** command in System Admin EXEC or XR 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

Examples

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 Commands

Command	Description
install add	Adds the contents of an ISO image, package, and SMUs to the software repository.
show install log	Displays the entries stored in the logging installation buffer.
show install inactive	Displays inactive packages in the active software set.
show install request	Displays the list of incomplete installation manager requests.

install rollback to

To roll back the software set to a saved installation point or to the last committed installation point, use the **install rollback to** command in administration EXEC mode.

Administration EXEC Mode:

install rollback to {*point-id* | *label* | **committed**} [**auto-abort-timer** *time*] **location** *node-id* [**asynchronous** | **synchronous**] [**parallel-reload**] [**prompt-level** {**default** | **none**}] [**test**] [**pause sw-change**]

Syntax Description

<i>point-id</i>	Installation point ID number.
<i>label</i>	Label associated with an installation point.
committed	Rolls the Cisco IOS XR software back to the last committed installation point.
auto-abort-timer <i>time</i>	(Optional) Specifies an abort timer value, <i>time</i> , in minutes, which when expired loads the last committed loadpath.
location <i>node-id</i>	Specifies a node. The <i>node-id</i> argument is expressed in <i>rack/slot</i> notation.
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.
parallel-reload	(Optional) Forces all cards on the router to reload at the same time and then come up with the new software, rather than proceeding according to the option encoded in the install package.
prompt-level { default none }	(Optional) Specifies when you are prompted for input during the procedure. • default —You are prompted only when input is required by the operation. • none —You are never prompted.
test	(Optional) Verifies the effects of proposed operations without making changes to the Cisco IOS XR software.
pause sw-change	(Optional) Pauses the operation after the preparatory stage and before locking the configuration for the actual software change. While the operation is paused, you can perform configuration changes. You control the resumption of the operation at the CLI prompt.

Command Default

The operation is performed in asynchronous mode. The **install rollback to** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.0	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 rollback to** command to roll back the configuration to a saved installation point or to the last committed installation point. Rollback points are created when the router is booted and when packages are activated, deactivated, or committed. When an installation point is created, Cisco IOS XR software assigns an ID number to that rollback point. To roll back to a saved installation point, enter the installation point ID number assigned to it for the *point-id* argument. When a software configuration is committed with the **install commit** command, that configuration is also saved as the last committed installation point. Use the **committed** keyword to roll back to the last committed installation point.

Labels can be assigned to installation points using the **install label** command. Then these labels can be used to identify a specific installation point that you want to roll back to.

To display the saved rollback points available, use the online help function:

```
RP/0/RP0/CPU0:router(admin)# install rollback to ?
0          Specify the id for the install point to rollback to
1          Specify the id for the install point to rollback to
12         Specify the id for the install point to rollback to
15         Specify the id for the install point to rollback to
2          Specify the id for the install point to rollback to
4          Specify the id for the install point to rollback to
6          Specify the id for the install point to rollback to
7          Specify the id for the install point to rollback to
8          Specify the id for the install point to rollback to
9          Specify the id for the install point to rollback to
committed Rollback to the last committed installation point
```

If a rollback operation is beyond two saved installation points, a router reload is required to avoid system instability. If a reload is required, a confirmation prompt appears before the reload occurs. Use the **install rollback to** command with the **prompt-level none** keywords to automatically ignore any reload confirmation prompts and proceed with the rollback operation.

If a software operation requires a node reload, the config-register for that node should be set to autoboot. If the config-register for the node is not set to autoboot, then the system automatically changes the setting and the node reloads. A message describing the change is displayed.

If a rollback operation requires that a package be activated that is no longer on the system (because the package had been removed), a message appears in the output of the **install rollback to** command indicating that the specified installation point is unavailable and that the required package must be added to roll back the software set to the specified installation point.

Use the **test** keyword to verify the effects of the proposed operations and determine whether the rollback operation can be completed. After previewing the effects of the proposed operations, use the **show install log** command for more details about the effects of the proposed operations.

Use the **clear install rollback oldest** command to delete saved installation points from the installation buffer.

Use the **show install rollback** command to display the software set associated with a saved installation point.

Pausing Before Configuration Lock

Use the **pause sw-change** keywords to pause the operation before locking the configuration. A rollback operation begins with preparatory steps, such as software checks, and then proceeds with the actual software change. The configuration is locked for the actual software change. If you specify the **pause sw-change** keywords, the operation pauses before locking the configuration and provides you with the option to hold the operation while you perform configuration changes, and proceed with the software change whenever you choose. This is useful, for example, if your workflow involves configuring a router out of the network during software change and you want to minimize the time that the router is out of the network. You can specify these keywords for both asynchronous and synchronous operations. In both cases, follow the onscreen instructions to control the pausing and completion of the operation.

Task ID

Task ID	Operations
pkg-mgmt	read, write

Examples

The following example shows how to roll back to a saved installation point:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install rollback to 8

Install operation 10 'install rollback to 8' started by user
'user_b' at 07:49:26
UTC Mon Nov 14 2005.
The install operation will continue asynchronously.
RP/0/RP0/CPU0:router(admin)#Info:
The changes made to software configurations will not be persistent
Info: across system reloads. Use the command
'admin install commit' to make
Info: changes persistent.
Info: Please verify that the system is consistent following
the software
Info: change using the following commands:
Info: show system verify
Info: install verify

The currently active software is the same as the committed
software.

Install operation 10 completed successfully at 07:51:24 UTC Mon
Nov 14 2005.
```

In the following example, the software is rolled back to the last committed installation point and the rollback is paused before configuration lock and then completed when the user enters the **install operation complete** command:

```
RP/0/RP0/CPU0:router# install rollback to committed pause sw-change

Wed Jul 23 15:37:53.377 UTC
Install operation 16 'install rollback to committed pause sw-change'
  started by user 'userb' on SDR Owner via CLI at 15:37:54 UTC
Wed Jul 23 2008.
The install operation will continue asynchronously.
RP/0/RP0/CPU0:router#Info: Install Method: Parallel Process Restart
Info: Install operation 16 is pausing before the config lock is
      applied for the software change as requested by the user.
Info: No further install operations will be allowed until the
      operation is resumed.
Info: Please continue the operation using one of the following
      steps:
Info:  - run the command 'install operation 16 complete'.
Info:  - run the command 'install operation 16 attach synchronous'
      and then answer the query.
RP/0/RP0/CPU0:router# install operation 16 complete

Wed Jul 23 15:38:35.197 UTC
RP/0/RP0/CPU0:router#Info: Install operation 16 has been resumed.
Info: The changes made to software configurations will not be persistent
      across system reloads. Use the command '(admin)
      install commit' to make changes persistent.
Info: Please verify that the system is consistent following the
      software change using the following commands:
Info:  show system verify
Info:  install verify packages
Install operation 16 completed successfully at 15:39:18 UTC Wed
      Jul 23 2008.

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

Related Commands

Command	Description
install commit	Makes the current active software set persistent across RP reloads.
install label	Adds a label or description to a state associated with a rollback point.
show install log	Displays the entries stored in the logging installation buffer.
show install request	Displays the list of incomplete installation manager requests.

install verify healthcheck

To verify that processes and dynamic link libraries (DLLs) running on a node are correct, use the **install verify healthcheck** command in administration EXEC mode.

install verify healthcheck [**asynchronous**| **synchronous**] [**admin-profile**] [**location** *node-id*] [**repair**]

Syntax Description

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.
admin-profile	(Optional. Administration EXEC mode only) Verifies the processes and DLLs in the administration profile only.
location <i>node-id</i>	(Optional) Verifies the consistency of previously installed software from the designated node with the package file from which it originated. The <i>node-id</i> argument is expressed in <i>rack/slot</i> notation.
repair	(Optional) Repairs anomalies found by the install verify healthcheck process.

Command Default

The operation is performed in asynchronous mode: The **install verify healthcheck** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.0	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.

The **install verify healthcheck** command is responsible for verifying that processes and DLLs in use by the system are correct and are executing from the correct location.

**Note**

The **install verify healthcheck** command can take up to two minutes per package to process.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to use the **install verify healthcheck** command. This command is run in asynchronous mode:

```
RP/0/RP0/CPU0:router# install verify healthcheck

Install operation 10 'install verify healthcheck' started by user
'userb' on SDR Owner via CLI at 04:56:49 UTC Thu Feb 22 2007.
The install operation will continue asynchronously.

Info:      This operation can take 1 minute to completion. Please be patient.
Info:      0/RP0/CPU0 [RP] [SDR: Owner]
Info:      DLLs and processes have right version.
Info:      0/RP1/CPU0 [RP] [SDR: Owner]
Info:      DLLs and processes have right version.
Info:      0/1/CPU0 [LC] [SDR: Owner]
Info:      /pkg/md5/f322c8dff20af6b765c8e8423899401a has wrong version.
Info:      0/6/CPU0 [LC] [SDR: Owner]
Info:      /pkg/md5/f322c8dff20af6b765c8e8423899401a has wrong version.
Info:      Health Check Summary:
Info:      0/RP0/CPU0 DLLs and processes have right version.
Info:      0/RP1/CPU0 DLLs and processes have right version.
Info:      0/1/CPU0 Process(es) with wrong version found.
Info:      0/6/CPU0 Process(es) with wrong version found.
Install operation 10 completed successfully at 04:56:50 UTC Thu Feb 22 2007.
```

The following example shows sample output from the **install verify healthcheck** command when there are problems that are repaired:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install verify healthcheck repair

Info:      Node: 0/0/CPU0
Info:      process [ERROR] Anomalies Found.
Info:      process insthelper has version: 3.7.7
Info:      dll [SUCCESS] Health-check Successful.
Info:      Node: 0/3/CPU0
Info:      process [SUCCESS] Health-check Successful.
Info:      dll [ERROR] Anomalies Found.
Info:      dll verify has version 3.7.2.
Info:      Node: 0/RP0/CPU0
Info:      process [SUCCESS] Health-check Successful.
Info:      dll [SUCCESS] Health-check Successful.
Info:      Health Check Summary:
Info:      0/0/CPU0: ERROR.
Info:      0/3/CPU0: ERROR.
Info:      0/RP0/CPU0: SUCCESSFUL.
Info:      The processes can be repaired.
Info:      Repair begins
Info:      Restart insthelper on 0/0/CPU0...
Info:      Repair successful.
```

Info: Repair ends..

Related Commands

Command	Description
show install log	Displays the entries stored in the logging installation buffer.
show install request	Displays the list of incomplete installation manager requests.

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.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples 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 55: 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 Commands

Command	Description
install activate	Adds software functionality to the active software set.
show install package	Displays information about a package.

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

Examples 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 56: show install inactive Field Descriptions

Field	Description
Inactive Packages	Inactive packages present on the load.

Related Commands

Command	Description
install deactivate	Removes a package from the active software set.
show install package	Displays information about a package.

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	<i>install-id</i>	(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 <i>install-id</i> argument to display details for a specific operation. The <i>install-id</i> 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

Examples	This example shows how to display the summary of installation requests: <pre>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</pre>

```

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 Commands

Command	Description
install activate	Adds software functionality to the active software set.
install add	Adds the contents of an ISO image, package, and SMUs to the software repository.
install commit	Makes the current active software set persistent across RP reloads.
install deactivate	Removes a package from the active software set.
install remove	Deletes inactive packages from the software repository.
install rollback to	Rolls back the software set to a saved installation point or to the last committed installation point.

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

<i>package</i>	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

Examples

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 Commands

Command	Description
show install active	Displays active software packages.
show install inactive	Displays inactive packages in the active software set.
show install log	Displays the entries stored in the logging installation buffer.

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

Examples 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 Commands

Command	Description
install activate	Adds software functionality to the active software set.
install add	Adds the contents of an ISO image, package, and SMUs to the software repository.
install deactivate	Removes a package from the active software set.
install remove	Deletes inactive packages from the software repository.
install rollback to	Rolls back the software set to a saved installation point or to the last committed installation point.



Terminal Services Commands on

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.

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*.

- [absolute-timeout](#), page 609
- [access-class](#), page 611
- [autocommand](#), page 613
- [banner exec](#), page 616
- [banner incoming](#), page 618
- [banner login](#), page 620
- [banner motd](#), page 622
- [banner prompt-timeout](#), page 624
- [clear line](#), page 626
- [clear line vty](#), page 628
- [cli whitespace completion](#), page 630
- [databits](#), page 632
- [disconnect](#), page 634
- [disconnect-character](#), page 636
- [escape-character](#), page 638
- [exec-timeout](#), page 640
- [flowcontrol hardware](#), page 642
- [length](#), page 644
- [line](#), page 646
- [parity](#), page 648

- [resume](#), page 650
- [send](#), page 652
- [session-limit](#), page 654
- [session-timeout](#), page 655
- [show line](#), page 657
- [show sessions](#), page 661
- [show terminal](#), page 663
- [show users](#), page 665
- [stopbits](#), page 667
- [terminal exec prompt](#), page 669
- [terminal exec utility pager](#), page 671
- [terminal length](#), page 672
- [terminal width](#), page 674
- [timestamp disable](#), page 676
- [transport input](#), page 678
- [transport output](#), page 680
- [transport preferred](#), page 682
- [vty-pool](#), page 684
- [width \(display\)](#), page 687

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

<i>minutes</i>	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

Examples

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 618	Sets the idle wait timeout interval for user input over a physical terminal connection.
session-timeout , on page 655	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

<i>list-name</i>	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

Examples

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

<i>command</i>	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

Examples

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 the **show ip interface brief** command is automatically run when the user logs on to a vty session:

```
User Access Verification

Username: lab
Password:

Executing Autocommand 'show ip interface brief'
RP/0/RP0/CPU0:router# show ip interface brief

Interface                               IP-Address      Status           Protocol
MgmtEth0/RP0/CPU0/0                    172.16.0.0      Up               Up
POS0/0/0/0                              unassigned      Up               Up
POS0/0/0/1                              unassigned      Up               Up
POS0/0/0/2                              unassigned      Up               Up
POS0/0/0/3                              unassigned      Up               Up
POS0/3/0/0                              unassigned      Up               Up
POS0/3/0/1                              unassigned      Up               Up
POS0/3/0/2                              unassigned      Up               Up
POS0/3/0/3                              unassigned      Up               Up
```

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#
```

The following example shows how to use a command alias with the **autocommand** command to run more than one command when a user logs in to a default vty session. In this example, the alias “test” is created to

include the **show ip interface brief** command and the **show users** command. The autocommand feature is then used to run the “test” alias when a user logs in to the vty terminal:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# alias test show ip interface brief; show users
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# autocommand test
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:

Executing Autocommand 'test'
RP/0/RP0/CPU0:router# test

RP/0/RP0/CPU0:router# show ip interface brief
```

Interface	IP-Address	Status	Protocol
MgmtEth0/RP0/CPU0/0	172.16.0.0	Up	Up
POS0/0/0/0	unassigned	Up	Up
POS0/0/0/1	unassigned	Up	Up
POS0/0/0/2	unassigned	Up	Up
POS0/0/0/3	unassigned	Up	Up
POS0/3/0/0	unassigned	Up	Up
POS0/3/0/1	unassigned	Up	Up
POS0/3/0/2	unassigned	Up	Up
POS0/3/0/3	unassigned	Up	Up

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

Line	User	Service	Conns	Idle	Location
* vty0	lab	telnet	0	00:00:00	172.16.0.0

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

<i>delimiter</i>	Delimiting character is (c).
<i>message</i>	Message text. Text may include tokens in the form \$(<i>token</i>) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 57: banner exec Tokens, on page 617 .

Command Default

No EXEC banner is displayed.

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 **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 57: banner exec 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

Examples

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 618	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 620	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 622	Defines a customized MOTD banner.
banner prompt-timeout, on page 624	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

<i>delimiter</i>	Delimiting character is (c).
<i>message</i>	Message text. You can include tokens in the form \$(<i>token</i>) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 58: banner incoming Tokens, on page 619 .

Command Default

No incoming banner is displayed.

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.

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 58: 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

Examples

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 616	Defines a customized banner that is displayed whenever the EXEC process is initiated.
banner login, on page 620	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 622	Defines a customized MOTD banner.
banner prompt-timeout, on page 624	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

<i>delimiter</i>	Delimiting character is (c).
<i>message</i>	Message text. You can include tokens in the form \$(<i>token</i>) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 59: banner login Tokens , on page 620.

Command Default

No login banner is displayed.

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.

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 59: 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

Examples

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 616	Defines a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 618	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 622	Defines a customized MOTD banner.
banner prompt-timeout, on page 624	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

<i>delimiter</i>	Delimiting character is (c).
<i>message</i>	Message text. You can include tokens in the form \$(<i>token</i>) in the message text. Tokens are replaced with the corresponding configuration variable.

Command Default

No MOTD banner is displayed.

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.

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 60: banner motd 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

Examples

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 616	Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 618	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 620	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner prompt-timeout, on page 624	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

<i>delimiter</i>	Delimiting character is (c).
<i>message</i>	Message text. You can include tokens in the form <i>\$(token)</i> 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

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

Examples

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 616	Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 618	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 620	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 622	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 <i>node-id</i>	Specifies the location of a route processor (RP) where the auxiliary or console line to be cleared resides. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.

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
tty-access	execute

Examples

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 665	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

<i>line-number</i>	Line number in the range from 0 to 99.

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 **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

Examples

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 665	Displays information about the active lines on the networking device.

cli whitespace completion

To enable completion of a command when you type the space key, use the **cli whitespace completion** command in the appropriate line configuration mode. To disable whitespace completion, use the **no** form of this command.

cli whitespace completion

no cli whitespace completion

Syntax Description This command has no keywords or arguments.

Command Default Whitespace completion is disabled.

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 **cli whitespace completion** command to complete the next word of the command syntax if you type the space key before completing the word. If more than one option is valid, all options are displayed for you to choose one.

Task ID	Task ID	Operations
	tty-access	read, write

Examples The following example shows how to enable whitespace completion:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# cli whitespace completion
```

Related Commands

Command	Description
cli interactive syntax check	Enables interactive syntax checking.

databits

To set the data bits per character for physical terminal connections, use the **databits** command in line console configuration mode. To restore the default value, use the **no** form of this command.

databits {5| 6| 7| 8}

no databits

Syntax Description

5	Sets the data bits per character to 5.
6	Sets the data bits per character to 6.
7	Sets the data bits per character to 7.
8	Sets the data bits per character to 8.

Command Default

Eight databits per character.

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 **databits** command to set the data bits attributes for physical terminal connections. Physical terminal connections use either the console or auxiliary line template.

The **databits** command masks the high bit on input from devices that generate 7 data bits with parity. If parity is being generated, specify 7 data bits per character. If no parity generation is in effect, specify 8 data bits per character. The keywords **5** and **6** are supplied for compatibility with older devices and generally are not used.

Task ID

Task ID	Operations
tty-access	read, write

Examples

The following example shows how to set the data bits per character for the console terminal template to 7:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# databits 7
```

Related Commands

Command	Description
show users, on page 665	Displays information about the active lines on the networking device.
stopbits, on page 667	Sets the number of stop bits.

disconnect

To disconnect a network connection, use the **disconnect** command in XR EXEC mode.

disconnect [*connection-number*|*network-name*]

Syntax Description

<i>connection-number</i>	(Optional) Number of the line of the active network connection to be disconnected. Range is from 1 to 20.
<i>network-name</i>	(Optional) Name of the active network connection to be disconnected.

Command Modes

XR EXEC

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

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.

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

Examples

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 [*number*| *character*]

no disconnect-character

Syntax Description

<i>number</i>	(Optional) ASCII decimal equivalent of the disconnect character. Range is from 0 through 255.
<i>character</i>	(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

Examples

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 638	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**| *number*| *character*| **default**| **none**}

no escape-character

Syntax Description

break	Sets the escape character to the Break key.
<i>number</i>	ASCII decimal equivalent of the escape character. Range is from 0 through 255.
<i>character</i>	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

Examples

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 636	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

<i>minutes</i>	Minutes for the wait interval. Range is from 0 to 35791.
<i>seconds</i>	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

Examples

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 609	Sets the absolute timeout for line disconnection.
session-timeout, on page 655	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

Examples

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 665	Displays information about the active lines on the networking device.

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

<i>lines</i>	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

Examples

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 672	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 <i>template-name</i>	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

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 **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.

Task ID

Task ID	Operations
tty-access	read, write

Examples

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)#
```

Related Commands

Command	Description
vty-pool, on page 684	Creates or modifies a vty pool.

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

Examples

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 665	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

<i>connection</i>	(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

Examples

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 654	Sets the maximum number of outgoing terminal sessions from the current terminal.
show sessions, on page 661	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.
<i>line-number</i>	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.
<i>vty number</i>	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

Examples

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

<i>connections</i>	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

Examples

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

<i>minutes</i>	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

Examples

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 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*| **vtty number**]

Syntax Description

aux	(Optional) Displays the terminal line parameters for the auxiliary line.
location <i>node-id</i>	(Optional) Specifies the location for the route processor (RP) on which the auxiliary or console port resides. The <i>node-id</i> argument is entered in the <i>rack/slot</i> notation.
console	(Optional) Displays the terminal line parameters for the console line.
vtty number	(Optional) Specifies a virtual terminal line (vtty) 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

Examples

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	-/-
vtty0	0/0	-	-	-	0/0	-/-
vtty1	0/0	-	-	-	0/0	-/-
vtty2	0/0	-	-	-	0/0	-/-
vtty3	0/0	-	-	-	0/0	-/-
vtty4	0/0	-	-	-	0/0	-/-
vtty100	0/0	-	-	-	0/0	-/-
vtty101	0/0	-	-	-	0/0	-/-
vtty102	0/0	-	-	-	0/0	-/-
vtty103	0/0	-	-	-	0/0	-/-
vtty104	0/0	-	-	-	0/0	-/-
vtty105	0/0	-	-	-	0/0	-/-

Table 61: 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 62: 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.
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.

Field	Description
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

Examples 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 63: 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.
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 634	Disconnects a network connection.
resume , on page 650	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 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

Examples 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 64: 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.
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

Examples 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 65: 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 657	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

Examples

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
```

Related Commands

Command	Description
databits , on page 632	Sets the number of data bits.

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

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 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.

Task ID

Task ID	Operations
tty-access	read

Examples

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
```

Related Commands

Command	Description
line, on page 646	Specifies the console, the default, or a user-defined line template and enters line template configuration mode.
show terminal, on page 663	Display the terminal configuration settings for the current terminal line.

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

Examples

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

<i>lines</i>	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

Examples

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 644	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

<i>characters</i>	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

Examples

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 687	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

Examples

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

Examples

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 680	Determines the protocols that can be used for outgoing connections from a line.
transport preferred, on page 682	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

Examples

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 678	Defines which protocols to use to connect to a specific line of the router.
transport preferred , on page 682	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

Examples

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 678	Defines which protocols to use to connect to a specific line of the router.
transport output, on page 680	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.
<i>pool-name</i>	User-defined vty pool.
<i>first-vty</i>	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.
<i>last-vty</i>	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.
<i>template-name</i>	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

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 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 Configuration Guide 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.

Task ID

Task ID	Operations
tty-access	read, write

Examples

This example shows how to configure a user-defined vty pool (test1) that contains vtys 10 through 14 and references the user-defined line template test2:

```
RP/0/RP0/CPU0:router(config)# vty-pool test1 10 14 line-template test2
```

Related Commands

Command	Description
line , on page 646	Enters line template configuration mode for the specified line template.

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	<i>characters</i>	Number of characters to display on a screen. Range is from 0 to 512.

Command Default	<i>characters</i> : 80

Command Modes	Line console configuration Line default configuration Line template configuration

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>Release 5.0.0</td><td>This command was introduced.</td></tr><tr><td>Release 3.9.0</td><td>No modification.</td></tr></table>	Release	Modification	Release 5.0.0	This command was introduced.	Release 3.9.0	No modification.
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	<table><tr><th>Task ID</th><th>Operations</th></tr><tr><td>tty-access</td><td>read, write</td></tr></table>	Task ID	Operations	tty-access	read, write
Task ID	Operations				
tty-access	read, write				

Examples	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 674	Sets the width of the display terminal for the current terminal session.



Utility Commands on

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 bc, page 691](#)
- [utility cut, page 696](#)
- [utility date, page 701](#)
- [utility date set, page 704](#)
- [utility df, page 706](#)
- [utility du, page 710](#)
- [utility egrep, page 713](#)
- [utility fgrep, page 716](#)
- [utility find, page 719](#)
- [utility head, page 722](#)
- [utility less, page 724](#)
- [utility mv, page 726](#)
- [utility sort, page 728](#)
- [utility tail, page 732](#)
- [utility uniq, page 735](#)
- [utility wc, page 738](#)
- [utility which, page 740](#)

- [utility xargs, page 742](#)

utility bc

To implement an arbitrary precision calculator, use the **utility bc** command in XR EXEC mode.

utility bc [*file input-file*]

Syntax Description**file***input-file*

(Optional) Specifies the text file containing commands and function definitions to be interpreted by the bc utility.

After all files have been read, the bc utility reads input from the standard input (keyboard). If no files are specified, then only the standard input (keyboard) is used.

The syntax of the *input-file* argument is as follows: *device* :[/ *directory-path*]/ *filename*

Possible values of the *device*: argument are:

disk0:

Uses a file from disk0: file system.

disk0a:

Uses a file from disk0a: file system partition.

disk1:

Uses a file from disk1: file system.

disk1a:

Uses a file from disk1a: file system partition.

ftp:

Uses a file from an FTP network server. The syntax is

ftp:[[//*username*[:*password*]@]*location*]/*directory*]/*filename*

harddisk:

Uses a file from the hard disk drive file system (if present).

harddiska:

Uses a file from the hard disk partition (if present).

nvrn:

Uses a file from the nvrn: file system.

ipv4

Uses a file from an IPv4 access list or prefix list.

ipv6

Uses a file from an IPv6 access list or prefix list.

rcp:

Uses a file from a remote copy protocol (rcp) network server. The syntax is

rcp:[[//*username*@]*location*]/*directory*]/*filename*

tftp:

Uses a file from a TFTP network server. The syntax is **tftp**:[[//*location*]/*directory*]/*filename*

Use the online help (?) function to display the available devices and network protocols.

Command Default

If an input file is not specified, the standard input (keyboard) is used.

Command Modes

XR EXEC

Command History

Release	Modification
Release 3.8.0	No 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 bc** command to use the interactive, programmable calculator that supports a complete set of control structures, including functions. The utility first processes any specified files, and then reads input from the keyboard (standard input).

Input files (and standard input) are ASCII text files containing sequences of bc statements to be executed.



Note

The bc utility uses the bc programming language, an arbitrary precision calculator language with syntax similar to the C programming language. The bc utility does not support character or string manipulation.

The bc utility supports:

- 26 functions
- 26 simple variables
- 26 array variables (up to 2048 elements per array).

The bc utility supports the following common programming language constructs:

- “if”, “while”, and “for” statements
- User-defined functions with parameters
- Local variables

Information About Supported Network Protocols

In the syntax for the **ftp:**, **rcp:**, and **tftp:** network protocols, the location is either an IP address or a hostname. The filename is specified relative to the directory used for file transfers.

When no device is specified, the current directory is used. To view the current directory, enter the **pwd** command.

Table 66: Network Protocols Supported by Cisco IOS XR Software

Prefix	Name	Description
tftp:	Trivial File Transfer Protocol	<i>TFTP</i> 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	<i>FTP</i> 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	<i>Rcp</i> is a protocol that allows users to copy files to and from a file system residing on a remote host or server on the network. Rcp uses TCP to ensure the reliable delivery of data. Rcp downloads require a username.

Task ID

Task ID	Operations
universal	execute

Examples

In the following example, the **utility bc** command is used to execute the bc statements contained in the ASCII text file exp.txt:

```
RP/0/RP0/CPU0:router# utility bc file disk0:/usr/exp.txt
50
15
25
3
17
```

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 <i>character-list</i>	(-c) Cuts out the characters that are located on each line as specified with the <i>character-list</i> argument. The <i>character-list</i> 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 <i>field-list</i>	(-f) Cuts out the fields (lines) as indicated with the <i>field-list</i> argument. The <i>field-list</i> 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 <i>field-list</i> argument are assumed to be separated in the file by a delimiter character. The default delimiter is tab. Use the 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 <i>field-list</i> keyword and argument is specified.
delimiter <i>delimiter-character</i>	(Optional) (-d) Specifies an alternative delimiter to indicate the end of each field. Replace the <i>delimiter-character</i> argument with the character used as the delimiter.
<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.

file <i>input-file</i>	(Optional) Storage device and directory path of the text file used instead of the standard input (keyboard input). The syntax of the <i>input-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i> The <i>device</i> 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

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 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.

Task ID

Task ID	Operations
universal	execute

Examples

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
```

Related Commands

Command	Description
utility head , on page 722	Copies bytes or lines at the beginning of the output displayed from standard input or a file.
utility sort , on page 728	Sorts, merges, or sequence-checks the output displayed from standard input or a file.

Command	Description
utility tail , on page 732	Copies the end portion of the output displayed from standard input or a file.

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 <i>word</i>	(Optional) (+) Specifies the format for the date display. Use the online help system to display the available format syntax for the <i>word</i> 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.
<i>WORD</i>	(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

Examples

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 704	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

<i>hh</i>	Specifies the hour in 2-digit numerical format. Range is 00 to 23.
<i>mm</i>	Specifies the minutes in 2-digit numerical format. Range is 0 to 59.
<i>ss</i>	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

Examples

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 701	Displays the internal date and time of the router.

utility df

To display the amount of disk space available for a directory or file, use the **utility df** command in XR EXEC mode.

utility df [[*WORD*] [**kbytes**] [**mountinfo**] [**vsfStats**] [**file** *input-file*]] **usage**

Syntax Description

<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.
kbytes	(Optional) (-k) Displays the sizes in 1-K blocks (1024-byte units) instead of the default of 512 byte blocks.
mountinfo	(Optional) (-n) Displays the file-system mountpoints and types only.
vsfStats	(Optional) (-g) Displays all statvfs() information.
file <i>input-file</i>	(Optional) Specifies the storage device and directory path of the device, directory, or file. When a directory or file is specified, the df utility displays the amount of space on the file system that contains the directory or file. If no files are specified, then only the standard input (keyboard) is used. The syntax of the <i>input-file</i> argument is as follows: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i> The <i>device</i> 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

Information is displayed for all file systems.
The results are displayed in 512-byte blocks.

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 (disk free) **utility df** command to display the amount of disk space available for a device, directory, or file. Enter the command without keywords or arguments to display information for all mounted file systems.

Use the **vsfStats** keyword to invoke the statvfs() function, which provides additional details for all mounted file systems.



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 **kbytes** keyword can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

Examples

In the following example, the (disk free) **utility df** command is entered without keywords or arguments to display information for all file systems:

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

/dev/hd0t6          77987744      61592  77926152      1%  /harddisk:/
/nvram:             4086         60     4026         2%
/dev/disk1t6        2001280      382720  1618560       20%  /disk1:/
/dev/disk0t6        2001184      533568  1467616       27%  /disk0:/
/dev/fs0p1          121856         68     121787         1%  /bootflash:
```

See [Table 68: utility df Column Descriptions \(left to right\), on page 709](#) for column descriptions.

In the following example, the **kbytes** keyword is used to display information in 1-K blocks (1024-byte units) instead of the default of 512-byte blocks:

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

/dev/hd0t6          38993872      30796  38963076      1%  /harddisk:/
/nvram:             2043         30     2013         2%
/dev/disk1t6        1000640      191360  809280       20%  /disk1:/
/dev/disk0t6        1000592      266784  733808       27%  /disk0:/
/dev/fs0p1          60928         34     60893         1%  /bootflash:
```

See [Table 68: utility df Column Descriptions \(left to right\), on page 709](#) for column descriptions.

In the following example, the **mountinfo** keyword is used to display file-system mountpoints and types only:

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

Filesystem          Mounted on          Type
```

```

/dev/hd0t6          /harddisk:/      dos (fat32)
/nvram:
/dev/disk1t6        /disk1:/        dos (fat16)
/dev/disk0t6        /disk0:/        dos (fat16)
/dev/fs0p1          /bootflash:     flash

```

In the following example, the **vfsStats** keyword is used to invoke the `statvfs()` function, which provides additional details for all mounted file systems:

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

```

/dev/hd0t6  /harddisk:/
  Blocks:   9748468 total      9740769 avail    [4096-byte blocks]
  Files :           0 total          0 avail
  Type  : dos (fat32)
  Flags : 00000120 [32bit, noatime]

/nvram:
  Blocks:     2043 total        2013 avail    [1024-byte blocks]
  Files :           0 total          0 avail
  Type  :
  Flags : 00000000 []

/dev/disk1t6 /disk1:/
  Blocks:    62540 total        50580 avail    [16384-byte blocks]
  Files :           0 total          0 avail
  Type  : dos (fat16)
  Flags : 00000120 [32bit, noatime]

/dev/disk0t6 /disk0:/
  Blocks:    62537 total        45863 avail    [16384-byte blocks]
  Files :           0 total          0 avail
  Type  : dos (fat16)
  Flags : 00000120 [32bit, noatime]

/dev/fs0p1  /bootflash:
  Blocks: 62390272 total    62355240 avail    [1-byte blocks]
  Files :           2 total          0 avail
  Type  : flash
  Flags : 00000000 []

```

This table describes the significant fields shown in the display.

Table 67: utility df Field Descriptions

Field	Description
Files	Number of files in the file system.
Blocks	Amount of space available on the file system in 1-K blocks.
Total	Amount of disk space used by the directory or file.
Avail	Amount of space available for use by the directory or file on the file system.
Type	Type of file system.
Flags	Displays the file system properties.

In the following example, the **file source** keyword and argument are used to specify a directory:

```
RP/0/RP0/CPU0:router(admin)# utility df file disk0:/usr
/dev/disk0t6          2001184    533568    1467616    27% /disk0:/
```

This table describes the significant fields shown in the display.

Table 68: utility df Column Descriptions (left to right)

Field	Description
Filesystem	File system for the displayed information.
1k-blocks	Amount of space available on the file system in 1-K blocks.
Used	Amount of disk space used by the directory or file.
Available	Amount of space available for use by the directory or file on the file system.
Use%	Percentage of space used on the file system.
Mounted on	Storage device where the file system is mounted.

Related Commands

Command	Description
utility du, on page 710	Displays the amount of disk space used by one or more directories or files.

utility du

To display the amount of disk space used in a device, directory, or file, use the **utility du** command in XR EXEC mode.

utility du [[**all**| **specified**] [**kbytes**| **bytes**| **local**] [*WORD*] [**file** *source*]| **usage**]

Syntax Description

all	(Optional) (-a) Displays the disk space used for each file in the directory. By default, information is displayed only for the directory. Use the all keyword to display the total disk space used by all files in the directory, including the directory itself.
specified	(Optional) (-s) Displays the total disk space used for each specified file, rather than the totals for any subdirectories.
kbytes	(Optional) (-k) Displays the disk space used in 1-K blocks (1024-byte units) instead of the default of 512-byte blocks.
bytes	(Optional) (-p) Displays the disk space used in bytes (the default is 512-byte blocks). Also generates error messages for exiting files that cannot be displayed.
local	(Optional) (-x) Displays information for the local device only.
<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.
file source	(Optional) Displays the disk space used for a device, directory, or file. The syntax for the <i>source</i> argument is <i>device</i> : / <i>directory-path</i> [/ <i>filename</i>] The <i>device</i> 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. Enter the utility du command without specifying a device, directory, or file to display information for the current directory, and subdirectories. (The command behaves as if the filename dot (.) is entered.)
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

Information for the current directory 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.

Enter the **utility du** command without specifying a file to display information for the current directory. The command behaves as if the filename dot (.) is entered.

**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 **kbytes** keyword can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

Examples

In the following example, the **utility du** command is used to display the disk space used for the subdirectories in the MPLS package directory:

In the following example, the **utility du** command is used to display the disk space used for a subdirectories:

```
RP/0/RP0/CPU0:router# utility du file disk0:/
-mpls-3.8.0/configs37 /disk0:/-mpls-3.8.0/configs
```

In the following example, the **utility du** command is used to display the disk space used for the current working directory:

```
RP/0/RP0/CPU0:router# cd disk0:/
-mpls-3.8.0
RP/0/RP0/CPU0:router# utility du
160 ./schema
104 ./lib/cerrno
625 ./lib/mib
2545 ./lib
9658 ./bin
39 ./startup
840 ./parser
37 ./configs
```

```
35 ./mib
35 ./rules
34 ./partitions
135 ./etc/compat
167 ./etc
66 ./instdb_v
181 ./lc/bin
33 ./lc/startup
246 ./lc
112 ./instdb
14006 .
```

Related Commands

Command	Description
utility df , on page 706	Displays the amount of disk space available for a directory or file.

utility egrep

To search a file or the results of standard input using full regular expressions, use the **utility egrep** command in XR EXEC mode.

utility egrep {**expr** *expression*|**script** *expression-file*} [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility egrep *expression* [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility egrep usage

Syntax Description

expr <i>expression</i>	(-e) A regular expression. 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 <i>expression-file</i>	(-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 <i>expression-file</i> argument is: [<i>device</i> :]/ <i>filename</i>
<i>WORD</i>	(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 <i>search-file</i>	(Optional) The file used for the search. Replace the <i>search-file</i> argument with the device and directory path of the file. The syntax for the <i>search-file</i> argument is: [<i>device</i> :]/ <i>filename</i> .

usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no files are specified, the keyboard input (standard input) is used.

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 grep utility searches files for character patterns using regular expressions and returns all lines that contain that pattern. The **utility egrep** command uses full regular expressions (expressions using the full set of alphanumeric and special characters) to match the patterns.

The results are displayed to the standard output (terminal screen).

**Note**

The egrep 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

Examples

In the following example, the **utility egrep** command is used to locate the regular expression “uptime”. The **linenum** keyword is also entered to display the line number before each line of output.

```
RP/0/RP0/CPU0:router# show version | utility egrep expr uptime linenum
7:router uptime is 5 days, 19 hours, 27 minutes
```

In the following example, the **utility egrep** command is used to locate a regular expression in a file. In this example, all lines with “adm” are displayed. The * character is used as a wildcard.

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* nofile file disk0:/usr/passwd

adm:x:4:4:Admin:/var/adm:
lp:x:71:8:Line Printer Admin:/usr/spool/lp:
uucp:x:5:5:uucp Admin:/usr/lib/uucp:
nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
listen:x:37:4:Network Admin:/usr/net/nls:
ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:./bin/false
```

In the following example, the **nocase** keyword is used to ignore the character case:

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* nocase file disk0:/usr/passwd

adm:x:4:4:Admin:/var/adm:
lp:x:71:8:Line Printer Admin:/usr/spool/lp:
uucp:x:5:5:uucp Admin:/usr/lib/uucp:
nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
listen:x:37:4:Network Admin:/usr/net/nls:
ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:./bin/false
```

In the following example, the **linenum** keyword is used to append the line number to the beginning of each output line:

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* linenum file disk0:/usr/passwd

5:adm:x:4:4:Admin:/var/adm:
6:lp:x:71:8:Line Printer Admin:/usr/spool/lp:
7:uucp:x:5:5:uucp Admin:/usr/lib/uucp:
8:nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
9:listen:x:37:4:Network Admin:/usr/net/nls:
15:ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:./bin/false
```

Related Commands

Command	Description
utility fgrep , on page 716	Searches a file for a fixed character string.

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 <i>expression</i>	(-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 <i>expression-file</i>	(-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 <i>expression-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i>
<i>WORD</i>	(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 <i>search-file</i>	(Optional) The file used for the search. Replace the <i>search-file</i> argument with the device and directory path of the file. The syntax for the <i>search-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i>

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 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

Examples

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
```

Related Commands

Command	Description
utility egrep, on page 713	Searches a file using full regular expressions.

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 <i>directory-path</i>	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).
<i>LINE</i>	(Optional) UNIX command-line expressions provided as a string.
name <i>filename-pattern</i>	(Optional) Searches for the name of the file. The <i>filename-pattern</i> argument is a regular expression string.
user <i>user-id</i>	(Optional) Searches for files belonging to a specific user. The <i>user-id</i> 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

Examples

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
```

Related Commands

Command	Description
utility which, on page 740	Locates a program file.

utility head

To copy bytes or lines at the beginning of a file or from the standard input, use the **utility head** command in XR EXEC

mode.

utilityhead[*WORD*] [**bytes**] [**count number**][**file source**]| **usage**

Syntax Description

<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (-c) Copies the data in bytes from the beginning of each specified file. The default setting is to copy lines of data.
count number	(Optional) (-n) Specifies the number of lines (default) or bytes to be copied. The <i>number</i> argument is an unsigned decimal integer. By default, the utility head command copies the first ten units (lines or bytes) of the file. Use the count number option to change the default.
file source	(Optional) Specifies the storage device, directory, and filename for the files. If a file is not specified, the standard input is used.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If the **utility head** command is entered without keywords or arguments, the first ten lines of the file or standard output are copied.

If no file is specified, then the standard input 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

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 head** command copies the beginning bytes (default) or lines of one or more files to the standard output (usually the user interface display). Use the **bytes** or **lines** keywords to copy the data based on lines or bytes. Use the **count number** option to specify the number of bytes or lines to copy. By default, the **utility head** command copies the first 10 lines of each file.

If more than one file is selected, an identifying header is added before the output for each file. If no file is specified, then the standard input (keyboard) 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. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

Examples

In the following example, the **utility head** command is used to display the first 15 lines from the output of the **show version** command:

In the following example, the **utility head** command is entered with the **bytes** keyword. Only the first 15 bytes of output are displayed.

```
RP/0/RP0/CPU0:router# show version | utility head count 15 bytes
Cisco IOS XR S
RP/0/RP0/CPU0:router#
```

Related Commands

Command	Description
utility cut, on page 696	Cuts characters or lines from the output displayed from standard input or a file.
utility sort, on page 728	Sorts, merges, or sequence-checks the output displayed from standard input or a file.
utility tail, on page 732	Copies the end portion of the output displayed from standard input or a file.

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.
<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.
nocase	(Optional) (-i) Ignores uppercase and lowercase distinctions during comparisons.
position <i>line-number</i>	(Optional) (-j) Uses the line at <i>line-number</i> on the screen to position matched lines during a patter search.
startat <i>string</i>	(Optional) (-p) Starts at the first occurrence of the pattern specified by the <i>string</i> argument in the file.
file <i>source-file</i>	(Optional) Specifies the storage device and directory path for the text file to be displayed. The default is standard input. The syntax for the <i>source-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i>

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

Examples

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

<i>WORD</i>	(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 <i>source-file</i>	Specifies the storage device, directory, and filename for the file to be moved.
target <i>target-file</i>	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

Examples

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 696	Cuts characters or lines from the output displayed from standard input or a file.
utility sort, on page 728	Sorts, merges, or sequence-checks the output displayed from standard input or a file.
utility tail, on page 732	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

<i>WORD</i>	(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 <i>character</i>	(Optional) (-t) Specifies a character as the field separator.
ignoreblank	(Optional) (-b) Ignores leading blank characters in field comparisons.
key <i>key-definition</i>	(Optional) (-k) Defines a key to be the sort key. The <i>key-definition</i> argument field is defined using the following syntax: <i>field_start</i> [<i>type_string</i>] [<i>field_end</i>] [<i>type_string</i>] • <i>field_start</i> and <i>field_end</i>—Specifies the beginning and end of the key field. • <i>type_string</i>—Specifies attributes specific to the key. The <i>field_start</i> and <i>field_end</i> 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 <i>field_start</i>, the .n refers to the nth character of the specified field, and is taken as zero if not specified. For <i>field_end</i>, the .n refers to the nth character after the last character of the specified field, and is taken as zero if not specified. The <i>type_string</i> argument may be formed from the characters bdfnr, 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 <i>filename</i>	(Optional) (-o) Writes the results to a file. The <i>filename</i> argument is the destination disk, directory, and filename. The <i>filename</i> 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 <i>filename</i>	(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

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

Examples

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
muscle
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
```

Related Commands

Command	Description
utility cut, on page 696	Cuts characters or lines from the output displayed from standard input or a file.
utility head, on page 722	Copies bytes or lines at the beginning of the output displayed from standard input or a file.

Command	Description
utility tail, on page 732	Copies the end portion of the output displayed from standard input or a file.
utility uniq, on page 735	Displays or removes repeated lines in a file.

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

<i>WORD</i>	(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 <i>number</i>	(Optional) (-n) Copies the number of lines (default) or bytes specified with the <i>number</i> argument. The range is 0 to 4294967295. By default, the last 10 lines are copied. The <i>number</i> 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 <i>input-file</i>	(Optional) Directory path and filename for the input file. If no file is specified, then the standard input is used. The syntax for the <i>input-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i> The <i>device</i> 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

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 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.

Task ID

Task ID	Operations
universal	execute

Examples

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#
```

Related Commands

Command	Description
utility cut , on page 696	Cuts characters or lines from the output displayed from standard input or a file.
utility head , on page 722	Copies bytes or lines at the beginning of the output displayed from standard input or a file.

Command	Description
utility sort, on page 728	Sorts, merges, or sequence-checks the output displayed from standard input or a file.

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

<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.
afterChars <i>number</i>	(Optional) (-s) Ignores the first characters on each line of the input file. Use the <i>number</i> argument to specify the number of characters. The range is 0 to 4294967295.
afterField <i>number</i>	(Optional) (-f) Ignores the first fields on each line of the input file. Use the <i>number</i> 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 <i>input-file</i>	(Optional) Specifies an input file for processing. The <i>input-file</i> 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 <i>input-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i>. The <i>device</i> 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 <i>output-file</i>	(Optional) Specifies an output file. The <i>output-file</i> 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 <i>output-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i>. The <i>device</i> 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

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 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.

Task ID

Task ID	Operations
universal	execute

Examples

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
```

Related Commands

Command	Description
utility sort , on page 728	Sorts, merges, or sequence-checks the output displayed from standard input or a file.

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

<i>WORD</i>	(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 <i>input-file</i>	(Optional) Specifies the input file. The <i>input-file</i> 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 <i>input-file</i> argument is: <i>device</i> :[/ <i>directory-path</i>]/ <i>filename</i>. The <i>device</i> 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

Examples

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
```

utility which

To locate a program file, use the **utility which** command in XR EXEC mode.

utility which {[*WORD*]} [**all**] [**fullname**] [**long** [*link*]] **program** *program-name* [**usage**]

Syntax Description

<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.
all	(Optional) (-a) Displays all occurrences of the program specified by the program <i>pathname</i> keyword and argument.
fullname	(Optional) (-f) Displays the full pathname of the program file.
long [<i>link</i>]	(Optional) (-l) ("el") Displays the long format for each program found, and also displays link information if the file is a symlink.
program <i>program-name</i>	Specifies the name of the program file.
usage	(Optional) Displays the UNIX options supported by this 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

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

Examples

In the following example, the **utility which** command is entered without keywords or arguments to display the location of the perl program:

```
RP/0/RP0/CPU0:router# utility which program perl
      /pkg/bin/perl
```

In the following example, the **utility which** command is entered with the **fullname** keyword to display the full directory path of the perl program:

```
RP/0/RP0/CPU0:router# utility which fullname program perl
      /disk0:/-base-3.8.0.1I/sbin/perl
```

In the following example, the **utility which** command is entered with the **long** keyword to display additional details about the perl program file:

```
RP/0/RP0/CPU0:router# utility which long program perl
-rwxrwxrwx  1      0      0      19245 Jul 28 14:31 /pkg/bin/perl
```

Related Commands

Command	Description
utility find , on page 719	Locates a file.

utility xargs

To run a program from one or more argument lists, use the **utility xargs** command in XR EXEC mode.

utility xargs *[[WORD| trace] [program [program-name] [initial-arguments]]] usage*

Syntax Description

<i>WORD</i>	(Optional) UNIX command-line option string. The maximum number of characters is 80.
trace	(Optional) (-t) Prints each program on standard error before executing.
program	(Optional) Specifies the name of the program and initial arguments. If a program name is not specified, then the echo utility is used.
<i>program-name</i>	(Optional) Specifies the name of the program. If a program name is not specified, then the echo utility is used.
<i>initial-arguments</i>	(Optional) Specifies the initial arguments.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no program is specified, then the echo utility is used (the input lines are displayed).

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.

**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

Examples

In the following example, the **utility xargs** command is used to display the egress lines:

```
RP/0/RP0/CPU0:router# more disk0:/usr/files | utility xargs program grep EGRESS

disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-101
disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-102
disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-103
disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-104
disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-105
disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-106
disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-107
disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-108
disk0:/usr/atm.cfg:service-policy output EGRESS-common
disk0:/usr/atm.cfg:service-policy output EGRESS-common
disk0:/usr/atm.cfg:service-policy output EGRESS-common
disk0:/usr/atm.cfg:service-policy output EGRESS-common
disk0:/usr/atm.cfg:service-policy output EGRESS-common
.....
```




INDEX

A

abort command [75](#)
absolute-timeout command [609](#)
access-class command [611](#)
access-group (NTP) command [283](#)
add (bulkstat object) command [422](#)
admin command [77](#)
alias command [79](#)
apply-template command [82](#)
authenticate (NTP) command [286](#)
authentication-key (NTP) command [288](#)
autocommand command [613](#)

B

banner exec command [616](#)
banner incoming command [618](#)
banner login command [620](#)
banner motd command [622](#)
banner prompt-timeout command [624](#)
broadcast client command [292](#)
broadcast command [290](#)
broadcastdelay command [294](#)
buffer-size command [424](#)

C

cd command [170](#)
cdp advertise v1 command [30](#)
cdp command [28](#)
cdp holdtime command [32](#)
cdp log adjacency changes command [34](#)
cdp timer command [36](#)
cfs check command [172](#)
clear comment command [84](#)
clear configuration commits command [86](#)
clear configuration inconsistency command [88](#)
clear configuration inconsistency replica command [91](#)
clear context command [362](#)

clear line command [626](#)
clear line vty command [628](#)
clear snmp counters command [425](#)
cli whitespace completion command [630](#)
clock read-calendar command [56](#)
clock set command [58](#)
clock timezone command [60](#)
clock update-calendar command [64](#)
configure command [93](#)
copy command [174](#)

D

databits command [632](#)
delay command [328](#)
delete command [180](#)
description (interface) command [96](#)
dir command [182](#)
disconnect command [634](#)
disconnect-character command [636](#)
do command [98](#)
dumpcore command [364](#)

E

enable [427](#)
end command [100](#)
end-template command [102](#)
escape-character command [638](#)
exception filepath command [367](#)
exception pakmem command [371](#)
exception sparse command [373](#)
exception sprsize command [375](#)
exec-timeout command [640](#)
exit command [104](#)

F

flowcontrol hardware command [642](#)
 follow command [377](#)
 format (bulkstat) command [429](#)
 format command [184](#)

H

hostname command [106](#)
 hw-module subslot shutdown command [207](#)

I

index persistence command [431](#)
 install abort command [570](#)
 install activate command [572](#)
 install add command [574](#)
 install attach command [576](#)
 install auto-abort-timer stop command [579](#)
 install commit command [581](#)
 install deactivate command [583](#)
 install label command [585](#)
 install remove command [588](#)
 install rollback to command [590](#)
 install verify healthcheck command [594](#)
 instance (bulkstat schema) command [433](#)
 instance range [435](#)
 instance repetition command [437](#)
 interface (NTP) command [295](#)
 interface (track) command [330](#)

L

length command [644](#)
 line command [646](#)
 line-protocol track command [332](#)
 load commit changes command [107](#)
 load configuration failed command [109](#)
 load rollback changes command [111](#)
 locale country command [66](#)
 locale language command [68](#)
 location (SDR) command [412](#)

M

man command [113](#)
 master command [297](#)
 max-associations command [299](#)

mkdir command [190](#)
 monitor processes command [379](#)
 monitor threads command [384](#)
 multicast client command [301](#)
 multicast destination command [303](#)

N

notification linkupdown command [439](#)
 ntp clear command [307](#)
 ntp command [305](#)
 ntp reset drift command [308](#)

O

object command [334](#)
 object-list command [441](#)

P

parity command [648](#)
 peer (NTP) command [310](#)
 poll-interval command [443](#)
 process command [388](#)
 process mandatory command [390](#)
 pwd (config) command [116](#)
 pwd command [192](#)

R

redundancy switchover command [211](#)
 reload (administration EXEC) command [4](#)
 reload command [2](#)
 resume command [650](#)
 retain command [445](#)
 retry command [447](#)
 rmdir command [194](#)
 rollback configuration command [117](#)
 root command [120](#)
 route ipv4 command [336](#)

S

save configuration changes command [124](#)
 save configuration command [122](#)
 save configuration commit changes command [126](#)
 save configuration failed command [128](#)
 save configuration merge command [130](#)

- save rollback changes command [132](#)
- schema command [449](#)
- send command [652](#)
- server (NTP) command [313](#)
- session-limit command [654](#)
- session-timeout command [655](#)
- set default-afi command [134](#)
- set default-safi command [136](#)
- set default-vrf command [138](#)
- show aliases command [140](#)
- show bcdl command [16](#)
- show bcdl consumers command [19](#)
- show bcdl queues command [21](#)
- show bcdl tables command [22](#)
- show bcdl trace command [24](#)
- show calendar command [316](#)
- show cdp command [38](#)
- show cdp entry command [40](#)
- show cdp interface command [43](#)
- show cdp neighbors command [46](#)
- show cdp traffic command [50](#)
- show clock command [70](#)
- show configuration (config) command [142](#)
- show configuration changes command [144](#)
- show configuration failed (config) command [146](#)
- show configuration failed remove command [148](#)
- show configuration history command [150](#)
- show configuration inconsistency replica command [154](#)
- show configuration persistent command [156](#)
- show configuration running command [158](#)
- show configuration sessions command [160](#)
- show context command [392](#)
- show default-afi-safi-vrf command [162](#)
- show dll command [395](#)
- show environment command [213](#)
- show epm trace boot command [6](#)
- show exception command [398](#)
- show filesystem command [196](#)
- show fpd package command [217](#)
- show hw-module fpd command [221](#)
- show hw-module subslot brief command [226](#)
- show hw-module subslot config command [229](#)
- show hw-module subslot counters command [232](#)
- show hw-module subslot errors command [235](#)
- show hw-module subslot plim-subblock command [238](#)
- show hw-module subslot registers command [240](#)
- show hw-module subslot status command [243](#)
- show install active command [597](#)
- show install inactive command [599](#)
- show install log command [601](#)
- show install package command [603](#)
- show install request command [605](#)
- show inventory command [246](#)
- show led command [249](#)
- show line command [657](#)
- show media command [198](#)
- show memory command [401](#)
- show memory compare command [403](#)
- show memory heap command [406](#)
- show ntp associations command [317](#)
- show ntp status command [318](#)
- show operational command [251](#)
- show processes command [408](#)
- show reboot command [8](#)
- show redundancy command [254](#)
- show running-config command [164](#)
- show sdr command [416](#)
- show sessions command [661](#)
- show snmp command [451](#)
- show snmp context command [454](#)
- show snmp context-mapping command [456](#)
- show snmp engineid command [458](#)
- show snmp entity command [460](#)
- show snmp group command [462](#)
- show snmp host command [464](#)
- show snmp interface command [466](#)
- show snmp interface notification command [468](#)
- show snmp mib command [472](#)
- show snmp users command [478](#)
- show snmp view command [480](#)
- show terminal command [663](#)
- show track command [338](#)
- show users command [665](#)
- show variables boot command [11](#)
- show variables system command [13](#)
- show version command [256](#)
- show xml schema command [266](#)
- snmp test trap all command [555](#)
- snmp test trap infra command [559](#)
- snmp test trap interface command [561](#)
- snmp test trap snmp command [563](#)
- snmp-server chassis-id command [482](#)
- snmp-server community command [484](#)
- snmp-server community-map command [487](#)
- snmp-server contact command [489](#)
- snmp-server context command [491](#)
- snmp-server engineid command [495](#)
- snmp-server engineid remote command [497](#)
- snmp-server group command [500](#)
- snmp-server host command [503](#)
- snmp-server location command [507](#)
- snmp-server mib bulkstat max-procmem-size command [509](#)
- snmp-server mib bulkstat object-list command [510](#)
- snmp-server mib bulkstat schema command [512](#)
- snmp-server mib bulkstat transfer-id command [514](#)
- snmp-server notification-log-mib command [516](#)
- snmp-server packetsize command [518](#)
- snmp-server queue-length command [519](#)

snmp-server target list command [521](#)
 snmp-server throttle-time command [523](#)
 snmp-server timeouts subagent command [525](#)
 snmp-server trap authentication vrf disable command [526](#)
 snmp-server trap link ietf command [527](#)
 snmp-server trap throttle-time command [529](#)
 snmp-server trap-source command [543](#)
 snmp-server trap-timeout command [545](#)
 snmp-server traps command [531](#)
 snmp-server traps snmp command [538](#)
 snmp-server traps syslog command [541](#)
 snmp-server user command [547](#)
 snmp-server view command [550](#)
 snmp-server vrf command [552](#)
 source command [320](#)
 stopbits command [667](#)

T

template command [167](#)
 terminal exec command [669](#)
 terminal length command [672](#)
 terminal width command [674](#)
 threshold percentage command [342](#)
 threshold weight command [344](#)
 timestamp disable command [676](#)
 track command [340](#)
 transfer-interval command [564](#)
 transport input command [678](#)
 transport output command [680](#)
 transport preferred command [682](#)
 trusted-key command [322](#)
 type line-protocol state command [346](#)
 type list boolean command [348](#)
 type list threshold percentage command [350](#)
 type list threshold weight command [352](#)
 type route reachability command [354](#)
 type rtr command [356](#)

U

update-calendar command [324](#)
 upgrade hw-module fpd command [258](#)
 url command [566](#)
 utility bc command [691](#)
 utility cut command [696](#)
 utility date command [701](#)
 utility date set command [704](#)
 utility df command [706](#)
 utility du command [710](#)
 utility egrep command [713](#)
 utility fgrep command [716](#)
 utility find command [719](#)
 utility head command [722](#)
 utility less command [724](#)
 utility mv command [726](#)
 utility sort command [728](#)
 utility tail command [732](#)
 utility uniq command [735](#)
 utility wc command [738](#)
 utility which command [740](#)
 utility xargs command [742](#)

V

vrf (track) command [358](#)
 vty-pool command [684](#)

W

width (display) command [687](#)

X

xml agent command [276](#)
 xml agent tty command [279](#)