



Cisco IOS XR System Management Command Reference

Cisco IOS XR Software Release 3.8

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Text Part Number: OL-17321-05

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Cisco IOS XR System Management Command Reference
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Preface

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

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

Changes to This Document

[Table 1](#) lists the technical changes made to this document since it was first printed.

Table 1 *Changes to This Document*

Revision	Date	Change Summary
OL-17321-05	July 2010	The number of files that can be activated in an install activate operation was corrected to be 16. The show operational command was correctly documented as being supported in administration EXEC mode.
OL-17321-04	April 2010	Information was added to the syntax description of the snmp-server community command and the usage guidelines of the snmp-server user command were corrected. Output from the show inventory command was more completely explained.
OL-17321-03	January 2010	Command history table for the clear comment command was corrected.
OL-17321-02	August 2009	Support for EXEC mode in the show variables boot command was added.
OL-17321-01	March 2009	Initial release of this document.

Obtaining Documentation and Submitting a Service Request

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Boot Commands on Cisco IOS XR Software

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

For more information about ROM Monitor (ROMMON) and boot tasks, see *Cisco IOS XR ROM Monitor Guide* or *Cisco IOS XR Getting Started Guide*.

config-register

To define the configuration register boot value, use the **config-register** command in administration EXEC mode.

config-register *value* [**location** {*node-id* | **all**}]

Syntax Description

<i>value</i>	Hexadecimal or decimal value that represents the 16-bit configuration register value to be used the next time the router is reloaded. Range is from 0x0 to 0xFFFF (0 to 65535 in decimal). For information about common configuration register settings, see Table 2 .
location { <i>node-id</i> all }	Specifies the node in a multishelf system. The all keyword specifies all RP nodes.

Defaults

By default, the configuration register value is 0x102 after a TURBOBOOT.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. This command was moved from global configuration mode to administration EXEC mode.
Release 3.3.0	Support was added for the location keyword.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The configuration register setting is a 16-bit, user-configurable value that determines how the route processor (RP) functions during initialization. The configuration register can cause the RP to boot normally from the default configuration, or to enter ROMMON mode during a reload. Configuration register settings can also be used to perform tasks such as password recovery.

The **config-register** command is entered in administration EXEC mode, on the designated system controller (DSC) of the system. The DSC is the primary RP of the owner secure domain router (owner SDR). When setting the configuration register value for the **config-register** command, note the following conditions:

- If both the primary and standby DSC are up and running when the configuration register value is set, the configuration register value applies to both the primary and standby DSC.
- By contrast, if only the primary DSC is up and running when the configuration register value is set and the standby DSC is introduced into the router at a later time, the router does *not* attempt to synchronize the configuration register value for the standby RP to that of the active RP; in this situation, the configuration register setting applied to the standby DSC is determined by the configuration register value set in ROMMON mode.
- To set the configuration register value for all RPs in a multishelf system, enter the command **config-register value location all**.

**Note**

To display the current configuration settings, use the command **show variables boot**.

Enter the command **config-register value** to set the configuration register setting for the DSC (DSDRSC of the owner SDR).

The most commonly used configuration register settings are described in [Table 2](#).

Table 2 Common Configuration Register Settings

Value	Description
0x0	RP enters ROMMON mode (<code>rommon B1></code>) on the next system boot.
0x2	RP loads the Cisco IOS XR software and default configuration on the next system boot. After logging in, the user can access EXEC mode.
0x102	Router loads the Cisco IOS XR software with the console break key disabled on the next system boot.
0x40	Router enters the password recovery mode on the next system boot.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to set the configuration register on the DSC to 0x2. Setting the configuration registration to 0x2 causes the router to boot the **Cisco IOS XR software** and enter EXEC mode during a router reload.

```
RP/0/RP0/CPU0:router(admin)# config-register 0x2
```

```
Successfully set config-register to 0x2 on node 0/RP0/CPU0
Successfully set config-register to 0x2 on node 0/RP1/CPU0
```

Related Commands	Command	Description
	reload	Performs a reload of the route processor.
	show variables boot	Displays the configuration register setting and boot file setting for the RPs in the system.
	show version	Displays information about the Cisco IOS XR software.

mirror

To configure disk mirroring on a node, use the **mirror** command in global configuration mode. To disable disk mirroring, use the **no** form of this command.

mirror location [**preconfigure**] *node-id primary-device:secondary-device:*

no mirror location *node-id*

Syntax Description	<i>primary-device:</i>	Specifies the primary boot device used to store installation packages and configuration files. - On the Cisco XR 12000 Series Router, the supported devices are disk0:, disk1:, and compactflash: (if installed). - On the Cisco CRS-1, the supported devices are disk0: and disk1: (if installed).
	<i>secondary-device:</i>	Storage device on the same RP as the <i>primary-device</i> , to where critical data is replicated. Supported devices are the same as for <i>primary-device:</i>, but <i>secondary-device:</i> must be different than the <i>primary-device:</i>.
	preconfigure	Enables you to specify a node that is not yet installed.
	<i>node-id</i>	Node in a multishelf system. It can be a node that is not yet installed if the keyword preconfigure is used.

Defaults No default behavior or values

Command Modes Global configuration

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **mirror** command replicates all critical data contained in the primary partition of the primary boot device, onto a second storage device on the same RP. Therefore, if the primary boot device fails, applications continue to be serviced transparently by the secondary device, without having to switch control to a standby RP.

Before the mirror command can be used, the secondary storage device must be partitioned using the **format** command. If the primary boot device is not partitioned, once mirroring is enabled and all data on the primary boot device is replicated to the secondary device, the primary boot device is partitioned automatically. This guarantees that only critical data on the primary boot device is mirrored to the secondary device. Noncritical data, such as logging data, should not be mirrored and should, therefore, be saved to the secondary partition on the storage device.

To temporarily suspend disk mirroring without changing the configuration, use the **mirror pause** command in EXEC mode.

Task ID	Task ID	Operations
	root-lr	read, write

Examples The following example shows how to configure disk mirroring from the primary boot device (disk0:) to the secondary storage device (disk1:):

```
RP/0/RP0/CPU0:router(config)# mirror location 0/rp0/cpu0 disk0: disk1:
```

Related Commands	Command	Description
	format	Formats a file system.
	mirror pause	Temporarily pauses disk mirroring on a node.
	mirror resume	Resumes disk mirroring on a node after it has been temporarily stopped.

mirror pause

To temporarily pause disk mirroring on a node, use the **mirror pause** command in EXEC or administration EXEC mode.

mirror pause [**location** {*node-id* | **all**}]

Syntax Description

location { <i>node-id</i> all }	Specifies the RP node in a multishelf system. The all keyword specifies all RP nodes.

Defaults

If no node is specified, disk mirroring is paused on the active RP.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **mirror pause** command temporarily pauses the mirroring of the primary boot device. This command is primarily useful during an installation operation to prevent significant performance degradation on single CPU boards. The **mirror pause** command does not change the configured state of mirroring, but rather causes the mirroring to be suspended until the **mirror resume** command is used.

The **mirror pause** command has no affect if the **mirror** configuration command is not enabled.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to pause disk mirroring on the active RP:

```
RP/0/RP0/CPU0:router# mirror pause
```

Related Commands	Command	Description
	mirror	Configures disk mirroring on a node.
	mirror resume	Resumes disk mirroring on a node after it has been temporarily stopped.

mirror resume

To resume disk mirroring on a node after it has been temporarily stopped, use the **mirror resume** command in EXEC or administration EXEC mode.

mirror resume [**location** {*node-id* | **all**}]

Syntax Description

location { <i>node-id</i> all }	Specifies the RP node in a multishelf system. The all keyword specifies all RP nodes.

Defaults

If no node is specified, disk mirroring is enabled on the active RP.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **mirror resume** command resumes the mirroring of the primary boot device after it has been temporarily paused with the **mirror pause** command.

The **mirror resume** command has no affect if the **mirror** configuration command is not enabled and the **mirror pause** command has not been used.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to resume disk mirroring on the active RP:

```
RP/0/RP0/CPU0:router# mirror resume
```

Related Commands	Command	Description
	mirror	Configures disk mirroring on a node.
	mirror pause	Temporarily pauses disk mirroring on a node.

mirror verify

To verify disk synchronization for disk mirroring on a node, use the **mirror verify** command in EXEC or administration EXEC mode.

mirror verify [**location** *node-id*]

Syntax Description	location <i>node-id</i>	Specifies the RP node in a multishelf system.

Defaults	If no node is specified, the verification is done on the active RP.

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

The **mirror verify** command verifies the synchronization consistency between the primary and secondary media devices being used in mirroring. The command verifies that the full contents are identical between the mirrored devices and reports any inconsistencies found.

Task ID	Task ID	Operations
	root-lr	read, write

Examples	The following example shows how to verify the disk mirroring on the active RP:

```
RP/0/0/CPU0:router# mirror verify
```

```
Mirror Verify Information for 0/0/CPU0.  
=====  
Primary device and secondary device are fully synchronized.
```

Related Commands

Command	Description
mirror	Configures disk mirroring on a node.

reload

To reload the designated secure domain router system controller (DSDRSC), use the **reload** command in EXEC mode.

reload

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Releases	Modifications
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.4.1	The force keyword was not supported.
	Release 3.5.0	Prompt was added to continue with reload in the event that there is no available standby node.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **reload** command to cause the DSDRSC 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 RP to EXEC mode). If a standby DSDRSC is in the ready redundancy state, the **reload** command also causes the router to fail over to the standby DSDRSC. Use the **show redundancy** command in EXEC mode to display the status of the standby RP.

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

**Caution**

If a standby RP is not installed or is not in the ready state, then the router experiences a loss of service while the active RP is reloading the Cisco IOS XR software. To view the status of the standby RP, 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]
```

Task ID

Task ID	Operations
root-lr	execute

Examples

The following example shows how to reload the active RP. If a standby RP is in the ready state, then the router fails over to the standby RP. If the standby RP 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
config-register	Defines the configuration register setting in administration EXEC mode.

Command	Description
reload (administration EXEC)	Performs a reload of a single node or all nodes in the system.
show redundancy	Displays the redundancy status of the RPs.

reload (administration EXEC)

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

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

Syntax Description

location	Specifies which node to reload.
<i>node-id</i>	The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
all	Reloads all the nodes in the system.
rack	Reloads all the nodes on a specified chassis.
<i>rack-number</i>	Rack number of the line card chassis or fabric chassis.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.4.0	No modification.
Release 3.4.1	The force keyword was not supported.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



Note

Before reloading nodes on a Cisco CRS-1 router, we recommend using the **cfs check** command to check the sanity of the configuration file system and attempt to recover from internal inconsistencies. Enter the **cfs check** command on each secure domain router (SDR) that has nodes impacted by the reload. If you enter the **reload location all** command, run the **cfs check** command on every SDR in the system before reloading the router.

- To reload all the nodes in all chassis in a multishelf system, use the **reload location all** command.

- To reload all the nodes in a specific chassis, use the **reload rack** *rack-number* command. This command cannot be used to reload the DSC line card chassis (rack 0).
- 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 as *rack/slot/module*.
- To ensure a graceful reload and ensure the sanity of the configuration file system, enter the **cfs check** command on each SDR that has nodes impacted by the reload.

Task ID

Task ID	Operations
root-system	execute

Examples

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

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

```
Graceful reload of all nodes not supported
```

```
Assuming 'force'
```

```
Operation may result in file corruptions or loss of config. Proceed [Y/N]? y
```

**Note**

To ensure the sanity of the configuration file system, enter the **cfs check** command on each SDR impacted by the reload operation. If you enter the **reload location all** command, run the **cfs check** command on every SDR in the system before reloading the router.

The following example shows how to reload all the nodes in a single chassis:

```
RP/0/RP0/CPU0:router(admin)# reload rack 1
```

```
Graceful reload of a rack in admin mode is not supported
```

```
Assuming 'force' mode
```

```
Operation may result in file corruption or loss of config. Proceed? [confirm]
```

You cannot reload the chassis containing the DSC. The following example shows the message displayed if an attempt is made to reload rack 0 (line card chassis 0) in a multishelf system:

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

```
Reload of rack 0 is not supported in 3.6 release.
```

Related Commands

Command	Description
cfs check	Verifies the Configuration File System (CFS).
config-register	Defines the configuration register setting in administration EXEC mode.
reload	Performs a reload of the route processor.
show redundancy	Displays the redundancy status of the RPs.

show epm trace boot

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

```
show epm trace boot [unique | wrapping] [hexdump] [last n] [reverse] [stats] [tailf] [verbose]
[file filename1 original location node-id [...[file4 filename4 original location node-id]] |
location1 {node-id | all} [...[location4 {node-id | all}}]]
```

Syntax Description

hexdump	Displays traces in hexadecimal format.
last <i>n</i>	Displays the last <i>n</i> number of traces only.
reverse	Displays the most recent traces first.
stats	Displays execution path statistics.
tailf	Displays new traces as they are added.
unique	Displays unique entries only, along with the count of the number of times this entry appears.
verbose	Displays additional internal debugging information.
wrapping	Displays wrapping entries.
file <i>filename</i> original location <i>node-id</i>	Displays the trace file with the specified file name at the specified location. You can specify up to four trace files.
location <i>node-id</i>	Displays trace files located at the specified RP node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation. You can specify up to four nodes.
all	Displays all trace files at all RP nodes in the router.

Defaults

All traces from all trace files from all RP nodes are displayed in time order, starting with the oldest traces.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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. The command displays a merged output from a set of trace files.

Task ID	Task ID	Operations
	basic services	read

Examples

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

```
RP/0/RP0/CPU0:router(admin)# show epm trace boot
```

```
8 wrapping entries (1024 possible, 0 filtered, 8 total)
Jul 12 21:17:36.229 epm/boot 0/RP0/CPU0 t1 @ 00:00:14 - [init] start
Jul 12 21:17:54.746 epm/boot 0/RP0/CPU0 t1 @ 00:00:32 - [sysmgr] start
Jul 12 21:17:55.315 epm/boot 0/RP0/CPU0 t7 @ 00:00:33 - [sysmgr] start-level: start
Jul 12 21:17:59.899 epm/boot 0/RP0/CPU0 t9 @ 00:00:37 - [sysmgr] start-level: admin
Jul 12 21:20:13.564 epm/boot 0/RP0/CPU0 t15 @ 00:02:51 - [sysmgr] start-level: infra
Jul 12 21:21:47.562 epm/boot 0/RP0/CPU0 t11 @ 00:04:25 - [sysmgr] start-level: active
Jul 12 21:22:09.132 epm/boot 0/RP0/CPU0 t6 @ 00:04:47 - [sysmgr] start-level: final
Jul 12 21:22:17.475 epm/boot 0/RP0/CPU0 t9 @ 00:04:55 - [sysmgr] lr-plane-up
```

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 mirror

To display disk mirroring information, use the **show mirror** command in EXEC or administration EXEC mode.

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

Syntax Description

location <i>node-id</i>	Specifies RP node for which to display the mirroring information. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
all	Displays mirroring information for all RP nodes in the router.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
filesystem	read

Examples

The following is sample output from the **show mirror** command:

```
RP/0/0/CPU0:router# show mirror
```

```
Mirror Information for 0/0/CPU0.
```

```
=====
```

```
Mirroring Enabled
```

```
Configured Primary:      disk0:
```

```
Configured Secondary:    disk1:
```

```
Current Mirroring State:  Syncing Files
```

```

Current Physical Primary:  disk1:
Current Physical Secondary: disk0:

Mirroring Logical Device:  disk0:

Physical Device      State      Flags
-----
disk0:               Available  Enabled Formatted
disk1:               Available  Enabled Formatted
compactflash:        Not Present
disk0a:              Available  Formatted
disk1a:              Available  Formatted
compactflasha:       Not Present

Mirroring Rommon Variable
BOOT_DEV_SEQ_CONF = disk0::disk1:
BOOT_DEV_SEQ_OPER = disk1:
MIRROR_ENABLE = Y

Syncing Files
Number Left:         5735
Current file:         c12k-base-3.6.0.10I/schema/l2protocols_srp_action.schema
Current state:        File is Syncing

```

Table 3 describes the significant fields shown in the display.

Table 3 *show mirror Field Descriptions*

Field	Description
Mirroring Enabled	Indicates whether mirroring is enabled or disabled.
Configured Primary	If mirroring is enabled, the configured primary disk for mirroring.
Configured Secondary	If mirroring is enabled, the configured secondary disk for mirroring.
Current Mirroring State	Current status of mirroring. Possible values are as follows: Syncing files—Files are being synchronized between the primary and secondary disks. Not Configured—Mirroring is not configured. Mirroring Paused—In this state no mirroring is being done to the secondary device and the disk redundancy has been removed. The values of the BOOT_DEV_SEQ_OPER and MIRROR_ENABLE variables reflect this. Redundant—The primary and secondary disks are totally in synchronization. Any read or write failure on the primary device results in disk redundancy failover such that all operations are performed on the secondary device.
Current Physical Primary	Current primary disk.
Current Physical Secondary	Current secondary disk.
Mirroring Logical Device	Device name used by the mirroring process to intercept all application requests to that named device before passing them through to one of the mirrored physical devices.
Physical Device	Physical disk in router.

Table 3 *show mirror Field Descriptions (continued)*

Field	Description
State	Status of the disk. Possible values are as follows: Available—Disk exists in router and is available. Not present—Disk does not exist in router. “a” partitions of disks are only available after the disk has been formatted with the partition keyword.
Flags	Enabled—Disk mirroring has been enabled on this device and the device is part of the mirroring process. Repaired—During the boot, some minor inconsistencies were discovered on the disk and were repaired to make the file system consistent. Formatted—Disk was formatted before mirroring was enabled.
BOOT_DEV_SEQ_CONF=	ROM Monitor environmental variable for the boot disk sequence. This variable is set when mirroring is enabled through the mirror configuration command. The devices in this ROMMON variable declare the primary and the secondary devices of the mirroring process. The first device is the primary device and the second device is the secondary device in the mirroring process. Note This variable is also shared by the disk backup feature. This variable can also be set or unset using the system boot-sequence command of the disk backup feature. But the use of system boot-sequence and system backup commands is blocked, if mirroring is enabled.
BOOT_DEV_SEQ_OPER=	ROM Monitor environmental variable that reflects the state of the disk redundancy status. When mirroring is enabled and the state is redundant, this variable is set to the primary device followed by the secondary device. When mirroring is not in the redundancy state, then this variable is updated to contain only the primary device.
MIRROR_ENABLE	ROM Monitor environmental variable whose value reflects the mirroring status. If it is set to Y, then mirroring is enabled. If it is set to P, then mirroring is paused. If empty, mirroring is not enabled.

Related Commands

Command	Description
mirror	Configures disk mirroring on a node.
mirror verify	Verifies disk synchronization for disk mirroring on a node.

show reboot

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

```
show reboot {[first | last] {crashinfo | syslog | trace} | graceful | history [reverse] | pcdds} location
node-id
```

Syntax Description		
first		Displays information about the first ungraceful reboot.
last		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		Displays the reboot history information in reverse chronological order.
pcdds		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 <i>rack/slot/module</i> notation.

Defaults No default behavior or values

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following is 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

```

The following is sample output from the **show reboot** command with the **first crashinfo** keywords:

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

```
Crashinfo Timestamp: Thu Jul 19 20:32:57 2007
```

```
20070719 20:32:57
```

```
Crash Reason: Cause code 0x21000010 Cause: Missed deadline, client: sc-reddrv-main,
timeout: 5 Process: wd-critical-mon
Traceback: fc1941a0 fc194290 48200738 482013cc 48201c04 fc1d4fb0 Timezone UTC0
```

```
Exception at 0xfc1944c8 signal 5 c=1 f=3
```

```
Active process(s):
```

```
pkg/bin/wd-critical-mon Thread ID 1 on cpu 0
```



```

pkg/bin/l3test Thread ID 0 on cpu 1

REGISTER INFO
  r0      r1      r2      r3
R0  01000000 4817e8c0 4820e208 000000de
  r4      r5      r6      r7
R4  fc1b4856 7fffffff 4817e738 fc1b4856
  r8      r9      r10     r11
R8  00000000 602cf522 00000000 00000000
  r12     r13     r14     r15
R12 602cf51c 4820e1a0 00000000 00000000
  r16     r17     r18     r19
R16 00000000 00000000 00000000 00000000
  r20     r21     r22     r23
R20 00000000 00000000 48200000 48200000
  r24     r25     r26     r27
R24 48200000 48200000 48200000 48200000
  r28     r29     r30     r31
R28 00000028 00000001 21000010 6029b000
  cnt     lr      msr      pc
R32 00000000 fc194290 0002d932 fc1944c8
  cnd     xer
R36 44000094 20000006

```

SUPERVISOR REGISTERS

Memory Management Registers

Instruction BAT Registers

Index #	Value
IBAT0U #	0x1ffe
IBAT0L #	0x12
IBAT1U #	0
IBAT1L #	0
IBAT2U #	0x30000ffe
IBAT2L #	0xf0000032
IBAT3U #	0xffffc0003
IBAT3L #	0x40011

Data BAT Registers

Index #	Value
DBAT0U #	0x1ffe
DBAT0L #	0x12
DBAT1U #	0
DBAT1L #	0x10000012
DBAT2U #	0x30000ffe
DBAT2L #	0xf000006a
DBAT3U #	0xffffc0003
DBAT3L #	0x40011

Segment Registers

Index #	SR-Value
0 #	0
1 #	0
2 #	0
3 #	0
4 #	0
5 #	0
6 #	0
7 #	0
8 #	0
9 #	0
10 #	0
11 #	0

show reboot

```

12 # 0
13 # 0
14 # 0
15 # 0

Exception Handling Registers
Data Addr Reg # DSISR
0x602cf440 # 0x42000000
SPRG0 # SPRG1 # SPRG2 # SPRG3
0x1 # 0x21000010 # 0x6029b000 # 0
SaveNRestore SRR0 # SaveNRestore SRR1
0xfc1944c4 # 0x2d932

Miscellaneous Registers
Processor Id Reg # 0
HID0 # 0x8410c0bc
HID1 # 0x9001ac80

MSSCR0 # 0x88000
MSSSR0 # 0

STACK TRACE
#0 0xfc194290
#1 0x48200738
#2 0x482013cc
#3 0x48201c04
#4 0xfc1d4fb0

```

Related Commands

Command	Description
reload	Performs a reload of the route processor.

show system backup

To display the system backup details and history, use the **show system backup** command in EXEC or administration EXEC mode.

show system backup [*target-device*] [**details** | **diff**] [**verify**] [**location** {**all** | *node-id*}]

Syntax Description	<i>target-device</i>	(Optional) Displays the backup details and history for the specified device. - On the Cisco XR 12000 Series Router, the supported devices are disk0:, disk1:, and compactflash: (if installed). - On the Cisco CRS-1, the supported devices are disk0: and disk1: (if installed).
	details	(Optional) Lists the software packages and configurations stored on the specified backup device.
	diff	(Optional) Displays the differences between the software packages and configuration files on the backup device, with the packages and configuration files on the current boot device.
	verify	(Optional) Verifies the software packages and configuration files stored on the specified backup device.
	location <i>node-id</i>	(Optional) Displays information for a designated RP node.
	location all	(Optional) Displays information for all RP nodes.

Defaults Enter the **show system backup** command without keywords or arguments to display the date, time and status of the last backup for the current designated secure domain router system controller (DSDRSC). This command also displays the configured primary and secondary boot devices.

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show system backup** command to display details of the current system backup on a local storage device.

- Use the **show system backup** command to display information about the backup performed for the active RP to which you are logged in, including the date, time, and status of the last backup.
- Use the *target-device* argument command to display backup information for a specified device on a RP node.
- Use the **details** keyword to list information about the software packages and configuration files stored on the backup device.
- Use the **diff** keyword to display the differences between the software and configurations on the backup device and the software and configurations on the currently active boot disk.
- Use the **location node-id** keyword and argument to display information for a backup on a specific node. Use the **location all** keywords to display information for backups on all nodes in the system.

Command Modes

- To display information for the current secure domain router (SDR), enter the **show system backup** command in the EXEC mode of that SDR.
- When the command is entered in administration EXEC mode, the backup information for the owner SDR is displayed.

Task ID

Task ID	Operations
root-lr	execute

Examples

In the following example, the **show system backup** command displays the status of the last system backup:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show system backup

System Backup information for node0_0_CPU0 on disk1:
=====
Last Backup Successful
Backup started at Sat Jun 24 12:22:10 2006
  ended at Sat Jun 24 12:42:11 2006
Verify started at Sat Jun 24 12:42:12 2006
  ended at Sat Jun 24 12:48:47 2006
BOOT_DEV_SEQ_CONF=disk0::disk1:
BOOT_DEV_SEQ_OPER=disk0::disk1:
```

In the following example, the **show system backup** command is entered with the **details** keyword to display additional information about the configuration and software package files stored on the backup device. Because this command is entered in administration EXEC mode, the backup information for both the administration and SDR configurations is displayed.

```
RP/0/0/CPU0:router(admin)# show system backup details
```

```

System Backup information for node0_0_CPU0 on disk1:
=====
Last Backup Successful
Backup started at Sat Jun 24 12:22:10 2006
  ended at Sat Jun 24 12:42:11 2006
Verify started at Sat Jun 24 12:42:12 2006
  ended at Sat Jun 24 12:48:47 2006
BOOT_DEV_SEQ_CONF=disk0;;disk1:
BOOT_DEV_SEQ_OPER=disk0;;disk1:
Admin configuration last commit record on disk1:
  Device          Commitid    Time Stamp
  disk1:          2000000010  23:07:59 UTC Fri Jun 09 2006

SDR configuration last commit record on disk1:
  Device          Commitid    Time Stamp
  disk1:          1000000030  11:56:43 UTC Thu Jun 22 2006

Active software packages on disk1:
c12k-os-mpi-3.4.0
c12k-base-3.4.0
c12k-admin-3.4.0
c12k-fwdg-3.4.0
c12k-lc-3.4.0
c12k-rout-3.4.0
c12k-diags-3.4.0
c12k-k9sec-3.4.0
c12k-mcast-3.4.0
c12k-mgbl-3.4.0
c12k-mpis-3.4.0
No Inactive software packages on disk1:

```

In the following example, backup information is displayed for backups located on disk1 in all RPs in the system. In this example, a separate backup was created on disk1 of node 0/3/CPU0 for a non-owner SDR.

```
RP/0/0/CPU0:router(admin)# show system backup disk1: location all
```

```

System Backup information for node0_0_CPU0 on disk1:
=====
Last Backup Successful
Backup started at Sat Jun 24 12:22:10 2006
  ended at Sat Jun 24 12:42:11 2006
Verify started at Sat Jun 24 12:42:12 2006
  ended at Sat Jun 24 12:48:47 2006
BOOT_DEV_SEQ_CONF=disk0;;disk1:
BOOT_DEV_SEQ_OPER=disk0;;disk1:

System Backup information for node0_3_CPU0 on disk1:
=====
Last Backup Successful
Backup started at Sat Jun 24 13:02:23 2006
  ended at Sat Jun 24 13:21:30 2006
Verify started at Sat Jun 24 13:21:30 2006
  ended at Sat Jun 24 13:27:55 2006
BOOT_DEV_SEQ_CONF=disk0;;disk1:
BOOT_DEV_SEQ_OPER=disk0;;disk1:

```

Table 4 describes the significant fields shown in the display.

Table 4 *show system backup Field Descriptions*

Field	Description
BOOT_DEV_SEQ_CONF=	ROM Monitor environmental variable for the boot disk sequence. This variable is defined by the system boot-sequence command. The first disk is the primary device; the second disk is the backup (secondary) device. The value listed in the secondary device is also used as the default backup target device for the system backup command.
BOOT_DEV_SEQ_OPER=	ROM Monitor environmental variable for the boot disks currently in use by the system.

Related Commands

Command	Description
system boot-sequence	Defines the order of boot devices used to bring up a router. The secondary device argument also defines the default backup target device used by the system backup command.
system backup	Performs a backup of software and configuration files.

show variables boot

To display the configuration register setting and boot file setting for the route processors (RPs) in the system, use the **show variables boot** command in administration EXEC mode.

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

Syntax Description	location <i>node-id</i>	Specifies the node to reload. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
	all	Reloads all the nodes in the system.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.4.0	Support was added for the location keyword.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Use the **show variables boot** command to display system boot variables for the router. In administration EXEC mode, this command displays the configuration register setting and boot file setting for the RPs in the system. In EXEC mode, the configuration register setting and boot file setting for the active RP is displayed. 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 command [config-register](#). The boot variable is set in ROM Monitor mode. For more information about ROM Monitor mode, see *Cisco IOS XR ROM Monitor Guide*.

■ show variables boot

Task ID	Task ID	Operations
	root-lr	read

Examples

The following is sample output from the **show variables boot** command:

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

```
Node 0/RP0/CPU0:
```

```
  BOOT variable = disk0:hfr-os-mbi-3.3.30/mbihfr-rp.vm,1;
  CONFREG variable = 0x2
```

```
Node 0/RP1/CPU0:
```

```
  BOOT variable = disk0:hfr-os-mbi-3.3.30/mbihfr-rp.vm,1;
  CONFREG variable = 0x2
```

Related Commands	Command	Description
	config-register	Defines the configuration register setting in administration EXEC mode.
	show variables system	Displays internal system environmental variables set on the router.
	show version	Displays information about the Cisco IOS XR software.

show variables system

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

show variables system

Syntax Description	This command has no arguments or keywords.

Defaults	No defaults behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. Removed the boot keyword.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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

The **boot** keyword was removed from the **show variables system** command in Cisco IOS XR Software Release 3.2. 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

The following is 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
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_RP0_CPU0
EXIT_STATUS=0
SYSMGR_RESTART_REASON=0
AAA_USER=egran
EXEC_PID=18280619
TASKID_MAP_SIZE=72
HOME=/disk0:/usr
TMPDIR=/disk0:/var/tmp
PWD=/disk0:/usr
```

Related Commands

Command	Description
config-register	Defines the configuration register setting in administration EXEC mode.
show variables boot	Displays the configuration register setting and boot file setting for the RPs in the system.
show version	Displays information about the Cisco IOS XR software.

system backup

To back up the system software and configurations to a backup disk, use the **system backup** command in EXEC or administration EXEC mode.

```
system backup [target-device] [synchronous | asynchronous] [format {location {all | node-id} }  
| location {all | node-id}]
```

Syntax Description

<i>target-device</i>	(Optional) Specifies the storage device used for the system backup. If a target device is not specified, then the secondary device defined with the system boot-sequence command is used. If a target device is not specified with either command, then the system backup command returns an error. - The target device cannot be the current boot device. - The target device must be large enough to store the current software set and configuration. - On the Cisco XR 12000 Series Router, the supported storage devices are disk0:, disk1:, and compactflash: (if installed). - On the Cisco CRS-1, the supported storage devices are disk0: and disk1: (if installed).
format	(Optional) Formats a target disk that already contains a system backup. By default, the system backup command formats the target disk if that target disk does not contain a previous system backup. If the target disk already contains a backup, then the disk is not formatted again. The format keyword forces a format of the target device even if it contains a previous system backup.
location <i>node-id</i>	(Optional) Specifies an alternative node location for the backup target disk, such as the standby DSDRSC. By default, the backup files are copied to the target device in the current DSDRSC. Use the location <i>node-id</i> keyword and argument to specify an alternative node for the backup files, such as the standby DSDRSC. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
location all	(Optional) Backs up the software and configuration files to all RPs in the system or SDR. Each RP must contain a disk in the specified target device location, such as disk1.
asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, the command runs in the background, and the EXEC prompt is returned as soon as possible.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned. This is the default mode.

Defaults

The operation is performed in synchronous mode.
The backup files are copied to the secondary device defined with the **system boot-sequence** command.
The backup files are copied to the target device on the current secure domain router system controller (DSDRSC).

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Target Device for the Backup

Use the **system backup** command with the *target-device* argument to specify the local storage device for backup software and configuration files. The *target-device* argument is optional and applies only to the current backup operation.

- If a target storage device is not specified, then the files are backed up to the secondary storage device defined with the **system boot-sequence** command.
- If a target device is not specified with either the **system backup** command or the **system boot-sequence** command, then the backup operation is not allowed.

The *target-device* can be any local storage device except the current boot device, and must be large enough to store the current software set and configuration. On the Cisco XR 12000 Series Router, the supported storage devices are **disk0:**, **disk1:**, and **compactflash:** (if installed). On the Cisco CRS-1 router, the supported storage devices are **disk0:** and **disk1:** (if installed).

Location Node of the Target Device

By default, the backup is created on the specified target device of the active DSDRSC where the command is executed.

- To specify an alternate node for the system backup, such as the standby DSDRSC, use the **system backup** command with the **location node-id** keyword and argument.
- To perform the backup on all router processors (RPs) installed in a specified secure domain router (SDR), use the **system backup** command with the **location all** keywords in EXEC mode.
- To perform the backup on all RPs in all SDRs installed in the system, use the **system backup** command with the **location all** keywords in administration EXEC mode.

**Note**

Each RP or distributed route processor (DRP) impacted by the **system backup** command must contain the specified target device. For example, if the **system backup** command is executed for disk1 on all RPs in the system, then a flash disk must be installed in disk1 of each RP.

Command Modes

- Use the **system backup** command in administration EXEC mode to back up the administration plane configuration, including software and configurations for all SDRs in the system.
- Use the **system backup** command in the EXEC mode of an SDR to back up the software and configurations for a specific SDR.

Commit and Installation Operations Not Allowed During Backup

- Configuration changes are not allowed during the backup process. Any attempts to commit configuration changes are rejected until the backup operation is complete.
- The backup process cannot be performed during an installation operation. If an installation operation is performed while a backup is in process, the backup operation terminates.

Displaying the Current Backup Information

Enter the **show system backup** command to display information about the current backup files. If no backup exists, an error message is displayed.

Task ID	Task ID	Operations
	root-lr	read, write

Examples

The following example shows how to back up the software and configuration files for a Cisco XR 12000 Series Router.

- The command is run in administration EXEC mode, which backs up both the administration and SDR configurations.
- The target device is defined as disk1.
- Because this is the first backup on the device, the disk is formatted.

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# system backup disk1:

Info: node0_0_CPU0: formatting target device
Info: node0_0_CPU0: copying admin configuration
Info: node0_0_CPU0: copying SDR configuration
Info: node0_0_CPU0: copying installed software
Info: node0_0_CPU0: backup complete.
Info: node0_0_CPU0: verifying admin configuration
Info: node0_0_CPU0: verifying installed software
Info: node0_0_CPU0: verify complete.
Info: node0_0_CPU0: command succeeded.
```

Related Commands

Command	Description
show system backup	Displays the system backup settings and history.
system boot-sequence	Defines the order of boot devices used to bring up a router. The secondary device argument also defines the default backup target device used by the system backup command.
system backup	Performs a backup of software and configuration files.

system boot-sequence

To define the order of local storage devices used to boot a router, use the **system boot-sequence** command in EXEC or administration EXEC mode.

system boot-sequence {*primary-device* [*secondary-device*] | **disable**} [**location** {**all** | *node-id*}]

Syntax Description	<i>primary-device</i>	Default device where software packages are installed and run. This device is also the default location for router configurations. The value of the <i>primary-device</i> argument is normally disk0: .
	<i>secondary-device</i>	Secondary (backup) boot device, used by the system backup command to back up system software and configurations. - On the Cisco XR 12000 Series Router, the supported storage devices are disk0:, disk1:, and compactflash: (if installed). - On the Cisco CRS-1, the supported storage devices are disk0: and disk1: (if installed). Note The value of the <i>secondary-device</i> argument must be different from the value of the <i>primary-device</i> argument.
	disable	Temporarily disables the automatic recovery mechanism.
	location <i>node-id</i>	Defines the boot sequence on any RP in the current SDR. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
	location all	Defines the boot sequence on all RPs in all SDRs.

Defaults The primary device is **disk0:**. The (optional) secondary boot device is not defined.

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.4.1	The disable keyword and <i>secondary-device</i> argument were introduced.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **system boot-sequence** command to define the local storage devices used to boot a router. You can define two devices with this command:

- The value of the *primary-device* argument defines the default device where software packages are installed and run. This device is also the default location for router configurations.
- The value of the *secondary-device* argument defines the device used by the **system backup** command to back up system software and configurations. This field is optional.
- The secondary device can also be temporarily defined when the **system backup** command is executed with the *target-device* argument. Use the **system boot-sequence** command with the *secondary-device* argument to permanently define the secondary (backup) device.



Note

The primary and secondary device definitions remain in effect until the **system boot-sequence** command is entered again.

General Usage Guidelines

- The value of the *secondary-device* argument must be different from the value of the *primary-device* argument.
- We recommend disk0 as the primary boot device in the boot sequence, and disk1 as the secondary boot device.
- The boot device specified with the **system boot-sequence** command must be installed in the card, or the command is rejected.

Command Modes

- Use the **system boot-sequence** command in administration EXEC mode to define the boot sequence for all secure domain routers (SDRs) in the system.
- Use the **system boot-sequence** command in EXEC mode to define the boot sequence for a specific SDR.

Location Node

- Use the **location node-id** keyword and argument to define the boot sequence for a specific route processor (RP).
- Use the **location all** keywords to define the boot sequence for all RPs in the SDR. Use this command in administration EXEC mode to define the boot sequence for all RPs in all SDRs.

Disabling Automatic Recovery

Use the **system boot-sequence** command with the **disable** keyword to disable the automatic recovery.



Note

Automatic recovery is supported from Cisco IOS XR Software Release 3.4.1.

Displaying the Current Boot Sequence Settings

Enter the **show system backup** command to display the currently configured boot sequence devices.

■ **system boot-sequence**

Task ID	Task ID	Operations
	root-lr	read, write

Examples

The following example shows how to define the primary and secondary boot device for the active RP (DSC). In this example, the default location for software and configurations is disk0. The location for backups of software and configurations is disk1.

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# system boot-sequence disk0: disk1:
```

Info: node0_0_CPU0: command succeeded.

Related Commands	Command	Description
	system backup	Performs a backup of software and configuration files.
	show system backup	Displays the system backup settings and history.



Bulk Content Downloader (BCDL) Commands on Cisco IOS XR Software

The Bulk Content Downloader (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 and distributed route processors (DRPs).
- MPLS—to download the Label Forwarding Information Base (LFIB) entries to the line card.
- LPTS—to maintain the Internal Forwarding Information Base (IFIB) table on all nodes that do IP forwarding to and from the DRPs.
- 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. This module describes the available **show** commands that you can use to see the status of the BCDL process.

show bcdl

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

show bcdl [*group_name*]

Syntax Description	<i>group_name</i> (Optional) Displays information for a specific BCDL group.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.3	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	sysmgr	read

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

```
RP/0/RP0/CPU0:router# show bcdl ipv4_rib
```

```
grp ipv4_rib, gid 2052, sg cnt 1, agent jid 112, node 0/RP0/CPU0, pulse 23930, new mbr 0
sg  lwg fd csmr hdlr-act dnld-act susp wait-lck  seq pulse-tot pulse-out
0  2053 16    6      no      no      no      0 23950    23926    0
```

Table 5 describes the significant fields shown in the display.

Table 5 *show bcdl Field Descriptions*

Field	Description
group ipv4_rib	Type of download and the Group Services Protocol (GSP) group name.
gid 2052	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 112	Job identifier of the BCDL agent. The JID is numerical identifier for a particular process and remains the same across process restarts.
node 0/RP0/CPU0	Node, expressed in the <i>rack/slot/module</i> notation, in which the agent is running.
pulse 23930	Pulse code used by the producer to pulse the BCDL agent.
new mbr 0	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 non-zero, some thread is waiting for other thread to take control of this subgroup.
seq	Sequence number of the last message sent on this subgroup.
pulse-tot	Total number of pulses sent by the producer to the BCDL agent.
pulse-out	Total number of outstanding pulses that have not yet been processed by the BCDL agent.

show bcdl consumers

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

show bcdl consumers [*group_name*]

Syntax Description	<i>group_name</i> (Optional) Displays information for a specific BCDL group.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.3	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	sysmgr	read

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

```
RP/0/RP0/CPU0:router# show bcdl consumers ipv4_rib
```

```
group ipv4_rib, gsp gid 2029, 3 consumers, agent jid 113, node 0/5/CPU0
(expected 3 consumers to reply, received 3 replies)
pid      node    asg csg  lwg sus  messages      bytes  errs name
823389   0/5/CPU0    0   0 2030   N    20559    1518476    0 fib_mgr
45129    0/1/CPU0    0   0 2030   N     1922    222892    496 fib_mgr
45129    0/3/CPU0    0   0 2030   N     1922    222892    498 fib_mgr
```

Table 6 describes the significant fields shown in the display that are not described in Table 5.

Table 6 *show bcdl consumers Field Descriptions*

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

show bcdl queues [*group_name*]

Syntax Description	<i>group_name</i> (Optional) Displays information for a specific BCDL group.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.3	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	sysmgr	read

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

```
RP/0/RP0/CPU0:router# show bcdl queues ipv4_rib
```

```
group ipv4_rib, gsp gid 2052, 6 consumers, agent jid 112, node 0/RP0/CPU0
(expected 6 consumers to reply, received 6 replies)
```

pid	node	asg	csg	lwg	sus	msgs_in_q	bytes_in_q	errs	name
417925	0/RP0/CPU0	0	0	2053	N	0	0	0	fib_mgr
209029	0/RP1/CPU0	0	0	2053	N	0	0	0	fib_mgr
106595	0/4/CPU0	0	0	2053	N	0	0	0	fib_mgr
114785	0/4/CPU1	0	0	2053	N	0	0	0	fib_mgr

```
82008  0/6/CPU0  0  0 2053  N      0      0  0 fib_mgr
82008  0/1/CPU0  0  0 2053  N      0      0  0 fib_mgr
```

Table 5 and Table 6 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 EXEC mode.

show bcdl tables [*group_name*]

Syntax Description	<i>group_name</i> (Optional) Displays information for a specific BCDL group.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.3	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	sysmgr	read

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

```
RP/0/RP0/CPU0:router# show bcdl tables ipv4_rib
```

```
grp ipv4_rib, gid 2052, sg cnt 1, agent jid 112, node 0/RP0/CPU0, pulse 26587, new mbr 0
  sg lwg fd csmr hdlr-act dnld-act susp wait-lck seq pulse-tot pulse-out
    0 2053 16 6 no no no 0 26607 26583 0
sgs: 1, table_cnt: 1, table_mid_cnt: 6, buf size: 124
Showing table info for 1 subgroups
sg 0: has 1 tables (messages: 0, bytes: 0)
  table 0xe0000000: 6 members, dnld act: 0, messages: 26607, bytes: 3447976
```



```

cnsmr 0: pid 417925 on node 0/RP0/CPU0
cnsmr 1: pid 82008 on node 0/6/CPU0
cnsmr 2: pid 82008 on node 0/1/CPU0
cnsmr 3: pid 209029 on node 0/RP1/CPU0
cnsmr 4: pid 106595 on node 0/4/CPU0
cnsmr 5: pid 114785 on node 0/4/CPU1

```

Table 7 describes the significant fields shown in the display that are not described in Table 5 or Table 6.

Table 7 *show bcdl tables Field Descriptions*

Field	Description
sgs	Number of subgroups.
table_cnt	Number of tables in this subgroup.
sg	Specific subgroup for which information is provided.
has 1 tables	Number of tables in this subgroup.
messages	Messages sent that are not associated with a particular table ID.
bytes	Bytes sent that are not associated with a particular table ID.
table	Specific table ID for which information is provided.
6 members	Number of consumers associated with this table.
dnld act	Indicates whether the convergence flag has been sent or not
messages	Number of messages sent for a particular table.
bytes	Number of bytes sent for a particular table.
cnsmr 0: pid 417925 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 EXEC mode.

```
show bcdl trace [group_name] [event] [timing] [grpsnd] [wrapping | unique] [hexdump] [last n]
[reverse] [stats] [tailf] [verbose] [file1 filename1 original location {node-id | all} [...[file4
filename4 original location {node-id | all}]] | location1 {node-id | all} [...[location4 {node-id
| all}]]]
```

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.
event	(Optional) Displays event trace entries.
timing	(Optional) Displays timing trace entries.
grpsnd	(Optional) Displays group send trace entries.
wrapping	(Optional) Displays wrapping entries.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
hexdump	(Optional) Displays traces in hexadecimal format.
last n	(Optional) Displays the last <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 filename original location {node-id all}	(Optional) Specifies a filename and original location of the file to display.
location node-id	(Optional) Specifies the RP node for which to display the execution path monitoring information. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
all	Displays mirroring information for all RP nodes in the router.

Defaults

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.3	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
sysmgr	read

Examples

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

```
RP/0/RP0/CPU0:router# show bcdl trace ipv4_rib location 0/0/cpu0 | inc /a/
```

```
Jul  7 09:02:25.658 bcdl/a/ipv4_rib 0/0/CPU0 t1  E  bytes critical 524288, normal 262144,
max suspend 60
Jul  7 09:02:25.658 bcdl/a/ipv4_rib 0/0/CPU0 t1  E  buffer size set to 65200
Jul  7 09:02:25.981 bcdl/a/ipv4_rib 0/0/CPU0 t1  E  group_create bcdl_ipv4_rib returns 0,
gid is 2055
Jul  7 09:02:30.806 bcdl/a/ipv4_rib 0/0/CPU0 t3  E  queuing new consumer: pid 172153, node
0/0/CPU0
Jul  7 09:02:30.807 bcdl/a/ipv4_rib 0/0/CPU0 t3  E  add new member: pid 172153, node
0/0/CPU0 nmc 0 -> 1
Jul  7 09:02:31.812 bcdl/a/ipv4_rib 0/0/CPU0 t5  E  attempt open producer connection sg 0
Jul  7 09:02:31.895 bcdl/a/ipv4_rib 0/0/CPU0 t5  E  bind sg 0 to producer, fd 14, handle
0x48230e08
Jul  7 09:02:31.895 bcdl/a/ipv4_rib 0/0/CPU0 t5  E  sbe: gid 2055, lwg_s: 0, lwg 2056,
node 0/0/CPU0, ent 1, rc 11, rr 1
Jul  7 09:02:31.895 bcdl/a/ipv4_rib 0/0/CPU0 t5  E  send_bcdl_event: sending BCDL_EVENT,
rc 11(connection init), entries 1
Jul  7 09:02:31.942 bcdl/a/ipv4_rib 0/0/CPU0 t3  E  processing table request
Jul  7 09:02:31.943 bcdl/a/ipv4_rib 0/0/CPU0 t3  E  add 1 table tags, first tag 0xe0000000
Jul  7 09:02:31.945 bcdl/a/ipv4_rib 0/0/CPU0 t3  E  create_table_entry: create 0xe0000000,
in sg 0, with pid 172153, node 0/0/CPU0
Jul  7 09:02:31.945 bcdl/a/ipv4_rib 0/0/CPU0 t3  E  Call p_t_f to add table 0xe0000000 to
sg 0 inherit FALSE
```

■ show bcdl trace



CDP Commands on Cisco IOS XR Software

This chapter 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, refer to the *Implementing CDP on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

cdp

To enable the Cisco Discovery Protocol (CDP) globally or on a 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 arguments or keywords.

Defaults

CDP is disabled.

Command Modes

Global configuration
Interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The enable and disable keywords were removed.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

The following interface types do not support CDP:

- 802.1Q VLAN subinterfaces
- ATM interfaces and ATM subinterfaces
- Bundle Interfaces
- Loopback interfaces
- Service interfaces
- Tunnel Interfaces

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 Packet-over-SONET/SDH (POS) interface 0/0/0/1:

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

The following example shows how to disable CDP on Packet-over-SONET/SDH (POS) interface 0/0/0/1:

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

Related Commands	Command	Description
	show cdp	Displays global CDP information, including 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 global 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 arguments or keywords.

Defaults Version 2 is enabled.

Command Modes Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	The v2 keyword was removed.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 CDP on a supported interface.
	show cdp	Displays global CDP information, including 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 global configuration mode. To remove the **cdp holdtime** global 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 holdtime *seconds*

no cdp holdtime

Syntax Description	<i>seconds</i>	Holdtime to be sent in the CDP update packets. Range is 10 seconds to 255 seconds.

Defaults	<i>seconds</i> : 180

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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 timer** 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
```

The following example shows how to use the **no** form of the command to set the holdtime to the default of 180 seconds:

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

Related Commands

Command	Description
cdp timer	Specifies how often the software sends CDP updates.
show cdp	Displays global CDP information, including 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 global 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 arguments or keywords.

Defaults CDP adjacency table logging is disabled.

Command Modes Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 CDP information, including timer and holdtime information.

cdp timer

To specify how often the software sends Cisco Discovery Protocol (CDP) updates, use the **cdp timer** command in global configuration mode. To remove the **cdp timer** global 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. Range is 5 to 254 seconds. The default is 60 seconds.

Defaults	<i>seconds</i> : 60 seconds

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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 CDP packet sent by your networking device before discarding it.
show cdp	Displays global CDP information, including timer and holdtime information.

clear cdp counters

To reset Cisco Discovery Protocol (CDP) traffic counters to zero (0), use the **clear cdp counters** command in EXEC mode.

clear cdp counters location *node-id*

Syntax Description	location <i>node-id</i>	Clears CDP traffic counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults	The counters are set to zero.

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	cdp	read, write

Examples	The following example shows how to clear CDP counters. The show cdp traffic output shows that all traffic counters have been reset to zero (0).

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


CDP counters:

```
Packets output: 0, Input: 0
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: 0, Input: 0
Unrecognize Hdr version: 0, File open failed: 0
```

Related Commands

Command	Description
clear cdp table	Clears and resizes the table that contains CDP information about neighbors.
show cdp traffic	Displays traffic information between devices gathered using CDP.

clear cdp table

To clear and automatically resize the table that contains Cisco Discovery Protocol (CDP) information about neighbors, use the **clear cdp table** command in EXEC mode.

clear cdp table location *node-id*

Syntax Description

location <i>node-id</i>	Clears and resizes the CDP table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **clear cdp table** command to clear and resize the CDP table that contains the neighbor entries. The new table size is calculated according to the recommended hash table size, as seen in the **show cdp** command output.

Task ID

Task ID	Operations
cdp	read, write

Examples

The following example shows how to clear and resize the CDP table. The output of the [show cdp neighbors](#) command before and after use of the **clear cdp table** command shows that all information has been deleted from the table:

```
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
TBA04341195(151a Mg0/RP1/CPU0/0    171        T S         WS-C2924  0/1
```

```
RP/0/RP0/CPU0:router# clear cdp table
```

```
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
```

The **show cdp** command shows that the table has been resized:

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

```
Global CDP information:
```

```
  Sending CDP packets every 60 seconds
  Sending a holdtime value of 180 seconds
  Sending CDPv2 advertisements is enabled
```

Related Commands

Command	Description
show cdp	Displays global CDP information, including timer and holdtime information.
show cdp neighbors	Displays information about neighboring devices discovered by CDP.

show cdp

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

show cdp

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/0/0/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 8 describes the significant fields shown in the display.

Table 8 *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 CDP that is used to communicate with neighboring devices to CDPv1.
cdp holdtime	Specifies the time for which the receiving device should hold a CDP packet sent by your networking device before discarding it.
cdp timer	Specifies how often the software sends CDP updates.
clear cdp table	Clears and resizes the table that contains CDP information about neighbors.
show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using CDP.
show cdp interface	Displays information about the interfaces on which CDP is enabled.
show cdp neighbors	Displays information about neighboring devices discovered by CDP.
show cdp traffic	Displays traffic information between devices gathered using CDP.

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 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.

Defaults

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

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
cdp	read, write

Examples

The following is 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 9 describes the significant fields shown in the display.

Table 9 *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 as <i>rack/slot/module/port</i> .
Port ID (outgoing port)	Location of the port in use by the interface.
Holdtime	Time (in seconds) for which the device directs the neighbor to hold a CDP advertisement before discarding it. This field is controlled by the cdp holdtime command.
Version	Software version.
advertisement version	Version number of the advertising protocol.
VTP Management Domain	VLAN Trunking Protocol (VTP) domain name of neighbor device.
Native VLAN	VLAN ID.
Duplex	Duplex setting: half or full.

 show cdp entry

Related Commands	Command	Description
	show cdp	Displays global CDP information, including timer and holdtime information.
	show cdp interface	Displays information about the interfaces on which CDP is enabled.
	show cdp neighbors	Displays information about neighboring devices discovered by CDP.
	show cdp traffic	Displays traffic information between devices gathered using CDP.

show cdp interface

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

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

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.
	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/module</i> notation.

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

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

■ **show cdp interface**

Task ID	Task ID	Operations
	cdp	read, write

Examples

The following is 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 is 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 10](#) describes the significant fields shown in the display.

Table 10 *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.
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 CDP information, including timer and holdtime information.
	show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using CDP.
	show cdp neighbors	Displays information about neighboring devices discovered by CDP
	show cdp traffic	Displays traffic information between devices gathered using CDP.

show cdp neighbors

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

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

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.
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/module</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.

Defaults

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. When used with the detail keyword, the output was modified to display IPv6 neighbors.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

Task ID**Task ID Operations**

cdp	read

Examples

The following is 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
cisco_1	Mg0/0/CPU0/0	139	T S	WS-C2924M	Fa0/6
cisco_2	PO0/3/0/0	173	R	CRS-1	PO0/3/0/0
TBA04110127	Gi0/7/0/0	173	T S	WS-C6506	3/9
cisco_3	Gi0/7/0/2	171	R	CRS-1	Gi0/4/0/2

[Table 11](#) describes the significant fields shown in the display.

Table 11 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.

Table 11 *show cdp neighbors Field Descriptions (continued)*

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 is sample output for IPv4 and IPv6 neighbors from the **show cdp neighbors detail** command:

```
RP/0/0/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: POS0/4/0/3
Port ID (outgoing port): POS0/2/0/3
Holdtime : 177 sec

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

advertisement version: 2
```

Table 12 describes the significant fields shown in the display.

Table 12 *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 Connectionless Network Service (CLNS) protocol conventions.
Platform	Product name and number of the neighbor device.

Table 12 *show cdp neighbors detail Field Descriptions (continued)*

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 CDP information, including timer and holdtime information.
show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using CDP.
show cdp interface	Displays information about the interfaces on which CDP is enabled.
show cdp traffic	Displays traffic information between devices gathered using CDP.

show cdp traffic

To display information about the traffic gathered between devices using Cisco Discovery Protocol (CDP), use the **show cdp traffic** command in 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/module</i> notation.

Defaults	Displays CDP information aggregated across all nodes.

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	cdp	read

Examples

The following is 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 13 describes the significant fields shown in the display.

Table 13 *show cdp traffic Field Descriptions*

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

Table 13 *show cdp traffic Field Descriptions (continued)*

Field	Definition
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 CDP information, including timer and holdtime information.
show cdp entry	Displays information about a specific neighboring device or all neighboring devices discovered using CDP.
show cdp interface	Displays information about the interfaces on which CDP is enabled.
show cdp neighbors	Displays information about neighboring devices discovered by CDP.



Clock Commands on Cisco IOS XR Software

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

For more information about manually setting the router clock, see *Cisco IOS XR Getting Started Guide*.

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 *Cisco IOS XR System Management Configuration Guide*.

clock read-calendar

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

clock read-calendar

Syntax Description This command has no arguments or keywords.

Defaults Read calendar is disabled.

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

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

```
14:31:57.089 PST Tue Feb 10 2005
```

Related Commands

Command	Description
clock set	Sets the software clock settings.
clock update-calendar	Sets the calendar from the software clock.
show clock	Displays the clock settings.
update-calendar	Periodically updates the calendar from NTP.

clock set

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

Defaults Clock is not set.

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** *hh:mm:ss day month year* form of the command:

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

```
14:12:00.114 JST Fri Feb 10 2005
```

This example shows how to set the software clock using the **clock set** *hh:mm:ss month day year* form of the command:

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

```
14:38:00.069 PST Tue Feb 10 2005
```

Displaying the Clock Settings

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

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

```
14:38:11.292 PST Tue Feb 10 2005
```

Displaying the Available Months

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

```
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 summer-time	Configures the system to switch automatically to summer time (daylight saving time).
clock timezone	Sets the time zone for display.
show clock	Displays the clock settings.

clock summer-time

To configure the system to switch automatically to summer time (daylight saving time), use the **clock summer-time** command in global configuration mode. To remove the **clock summer-time** setting, use the **no** form of this command.

clock summer-time *zone* { **date** { *date month year hh:mm date month year hh:mm* | *month date year hh:mm month date year hh:mm* } | **recurring** { *week day month hh:mm week day month hh:mm* } } [*offset*]

no clock summer-time

Syntax Description

<i>zone</i>	Name of the time zone (for example, PDT) to be displayed when summer time is in effect. Table 14 on page 91 lists common time zone acronyms used for the <i>zone</i> argument.
date	Indicates that summer time should start on the first specific date listed in the command and end on the second specific date in the command.
<i>date</i>	Date of the month.
<i>month</i>	Month.
<i>year</i>	Year (no abbreviation).
<i>hh:mm</i>	Time (24-hour format) in hours and minutes.
recurring	Indicates that summer time should start and end on the corresponding specified days every year.
<i>week</i>	Week of the month (values are 1 to 5 , first or last).
<i>day</i>	Day of the week.
<i>offset</i>	(Optional) Number of minutes to add during summer time. The default is 60 minutes (1 hour).

Defaults

Summer time is not configured.
offset: 60

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **clock summer-time** command if you want the system to switch automatically to summer time (for display only):

- Use the **recurring** form of the command to apply the rules on the configured day each year. If **clock summer-time zone recurring** is specified without parameters, the summer time rules default to United States standards. The default for the *offset* argument is 60 minutes.
- Use the **date** form to specify a start and end date for summer time if you cannot use the first form.

In both forms of the command, the first part of the command specifies when summer time begins, and the second part specifies when it ends. All times are relative to the local time zone. The start time is relative to standard time. The end time is relative to summer time. If the starting month is after the ending month, the system assumes that you are in the Southern Hemisphere.

Task ID

Task ID	Operations
host-services	read, write

Examples

The following example specifies that summer time starts on the first Sunday in April at 02:00 and ends on the last Sunday in October at 02:00. The **recurring** keyword indicates that the rules apply every year.

```
RP/0/RP0/CPU0:router(config)# clock summer-time PDT recurring 1 Sunday April 2:00 last
Sunday October 2:00
```

If you live where summer time does not follow the pattern in the first example, you could set it to start on October 12, 2005 at 02:00 and end on April 26, 2006 at 02:00, with the following example. The **date** keyword indicates that the rules apply for the current year only.

```
RP/0/RP0/CPU0:router(config)# clock summer-time PDT date 12 October 2005 2:00 26 April
2006 2:00
```

Related Commands

Command	Description
clock set	Sets the software clock settings.
clock timezone	Sets the time zone for display.

clock timezone

To set the time zone for display, use the **clock timezone** command in global configuration mode. To remove the **clock timezone** setting, use the **no** form of this command.

clock timezone *zone* *hours-offset* [*minutes-offset*]

no clock timezone

Syntax Description	<i>zone</i>	Name of the time zone to be displayed when standard time is in effect.
	<i>hours-offset</i>	Hours offset from Coordinated Universal Time (UTC). Range is from –23 to +23.
	<i>minutes-offset</i>	(Optional) Minutes offset from UTC.

Defaults	UTC

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Use the **clock timezone** command only to display the time zone when setting the time manually. The system keeps time internally in UTC.

Table 14 lists common time zone acronyms used for the *zone* argument.

Table 14 Common Time Zone Acronyms

Acronym	Time Zone Name and UTC Offset
Europe	
GMT	Greenwich Mean Time, as UTC.
BST	British Summer Time, as UTC plus 1 hour.
IST	Irish Summer Time, as UTC plus 1 hour.
WET	Western Europe Time, as UTC.
WEST	Western Europe Summer Time, as UTC plus 1 hour.
CET	Central Europe Time, as UTC plus 1 hour.
CEST	Central Europe Summer Time, as UTC plus 2 hours.
EET	Eastern Europe Time, as UTC plus 2 hours.
EEST	Eastern Europe Summer Time, as UTC plus 3 hours.
MSK	Moscow Time, as UTC plus 3 hours.
MSD	Moscow Summer Time, as UTC plus 4 hours.
United States and Canada	
AST	Atlantic Standard Time, as UTC minus 4 hours.
ADT	Atlantic Daylight Time, as UTC minus 3 hours.
ET	Eastern Time, either as EST or EDT, depending on place and time of year.
EST	Eastern Standard Time, as UTC minus 5 hours.
EDT	Eastern Daylight Saving Time, as UTC minus 4 hours.
CT	Central Time, either as CST or CDT, depending on place and time of year.
CST	Central Standard Time, as UTC minus 6 hours.
CDT	Central Daylight Saving Time, as UTC minus 5 hours.
MT	Mountain Time, either as MST or MDT, depending on place and time of year.
MST	Mountain Standard Time, as UTC minus 7 hours.
MDT	Mountain Daylight Saving Time, as UTC minus 6 hours.
PT	Pacific Time, either as PST or PDT, depending on place and time of year.
PST	Pacific Standard Time, as UTC minus 8 hours.
PDT	Pacific Daylight Saving Time, as UTC minus 7 hours.
AKST	Alaska Standard Time, as UTC minus 9 hours.
AKDT	Alaska Standard Daylight Saving Time, as UTC minus 8 hours.
HST	Hawaiian Standard Time, as UTC minus 10 hours.

Table 14 Common Time Zone Acronyms (continued)

Acronym	Time Zone Name and UTC Offset
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).

Table 15 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 15 Single-Letter Time Zone Designators

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

Table 15 *Single-Letter Time Zone Designators (continued)*

Letter Designator	Word Designator	Difference from UTC
Y	Yankee	UTC minus 12 hours.
L	Lima	UTC plus 11 hours.
M	Mike	UTC plus 12 hours.

Task ID**Task ID****Operations**

host-services

read, write

Examples

The following example shows how to set the time zone to PST and offset 8 hours behind UTC:

```
RP/0/RP0/CPU0:router(config)# clock timezone PST -8
```

The following example shows how to set the time zone to Atlantic Time (AT) for Newfoundland, Canada, which is 3.5 hours behind UTC:

```
RP/0/RP0/CPU0:router(config)# clock timezone AT -3 30
```

Related Commands

Command	Description
clock set	Sets the software clock settings.
clock summer-time	Configures the system to switch automatically to summer time (daylight saving time).
clock timezone	Sets the time zone for display.
show clock	Displays the clock settings.

clock update-calendar

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

clock update-calendar

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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	Copies the hardware (calendar) clock settings into the software clock.

locale country

To set the default country of use, use the **locale country** command in global configuration mode. To remove the **locale 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.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



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

locale language *language*

no locale language

Syntax Description

<i>language</i>	Specifies the language, where <i>language</i> is a two-character code. Case is not important.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



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/RP1/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 EXEC mode.

show clock [detail]

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

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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.

Table 16 describes the leading symbols that precede the **show clock** command display.

Table 16 *show clock Display Leading Symbol Descriptions*

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

Task ID

Task ID	Operations
basic-services	read

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 2005
```

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 2005
```

```
Timezone: PST8PST Timesource: User configured
```

Related Commands

Command	Description
clock set	Sets the software clock settings.

show clock sync

To show the time difference between the clocks on route processors (RPs) and other line cards (LCs) in a Cisco XR 12000 Series Router, use the **show clock sync** command in EXEC command mode.

show clock sync

Syntax Description	This command has no arguments or keywords.

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

Command Modes	EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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

The **show clock sync** command verifies that the cards in a Cisco XR 12000 Series Router are synchronized with the primary RP. When this command is run, the primary RP queries the clocks on each card in the system and displays the time difference between each card and the primary RP. If the time setting on the card is different from the time on the primary RP, the display shows if the clock on the card is being adjusted to synchronize with the primary RP.

**Note**

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

Task ID

Task ID	Operations
ip-services	read
basic-services	read

Examples

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

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

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

Table 17 describes the significant fields shown in the display.

Table 17 *show clock sync Field Descriptions*

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

Related Commands

Command	Description
clock set	Sets the software clock settings.
show clock	Displays the clock settings.

■ show clock sync



Configuration Management Commands on Cisco IOS XR Software

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

For detailed information about configuration management concepts, tasks, and examples, see *Cisco IOS XR Getting Started Guide*.

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 arguments or keywords.

Defaults No default behavior or values

Command Modes Any configuration mode

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **abort** command to terminate a configuration session and return to EXEC mode from any configuration mode. This command causes all uncommitted configuration changes to be discarded. You will not be prompted to commit the changes.

Task ID This command requires the task ID for the feature or configuration submode 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 pos 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
	clear (config)	Discards changes to the target configuration that have not yet been committed, without exiting the configuration session.
	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 administration EXEC mode, use the **admin** command in EXEC mode.

admin

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. A note about correct usage was added.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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


Note

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

Task ID	Task ID	Operations
	admin	read, write, execute

Examples

The following example shows how to enter administration EXEC mode:

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

To use administration configuration mode, use the **configure** command in administration 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 global configuration mode. To delete an alias, use the **no** form of this command.

```
alias alias-name [(param1, param2, ..., paramx)] content1 [;content2; ...; contentx]

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>param1, paramx</i>	(Optional) Parameters assigned to the alias. These parameters are filled in at execution time.
<i>content1, contentx</i>	Original command syntax. Valid abbreviations of the original command syntax can be entered for the <i>content</i> argument.

Defaults

No command aliases are configured.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The <i>parameter</i> argument was added.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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, in any mode or submode.
- 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 submode, 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 here:

```
RP/0/RP0/CPU0:router# (config)# alias 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 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/RP0/CPU0:Feb 21 04:42:57.017 : config[65689]: %MGBL-LIBTARCFG-6-COMMIT : Co
nfiguration committed by user 'lab'. Use 'show configuration commit changes 1000000022'
to view the changes.
RP/0/RP0/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, cisco's-pos, for interface POS1/0/2/3 and then how to use that alias to shut down the interface:

```
RP/0/RP0/CPU0:router(config)# alias cisco's-pos POS1/0/2/3
RP/0/RP0/CPU0:router(config)# interface cisco's-pos
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 EXEC mode:

```
RP/0/RP0/CPU0:router(exec)# shint_both(POS1/2/3/4)
```

Two commands are issued, as follows:

```
RP/0/RP0/CPU0:router(exec)# show interface POS1/2/3/4; show run interface POS1/2/3/4
```

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 global configuration mode.

apply-template *template-name* [*param1* [...*param5*]]

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>param1 ... param5</i>	Up to five template parameters.

Defaults No templates are applied to the target configuration.

Command Modes Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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-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 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 crs1
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 (EXEC)

To reset command functions, use the **clear** command in administration EXEC mode or in EXEC mode.

clear *feature*

Syntax Description	<i>feature</i> System feature or functionality to reset.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Use the **clear** command in EXEC mode to reset and clear the contents of a feature. To display a list of the available clear commands, use the question mark (?) online help function.



Tip

The **clear** command can also be used in global configuration mode to clear the contents of a target configuration session without exiting configuration mode. See the **clear (config)** command.

Task ID	This command requires the task ID for the feature or configuration submode impacted by the command.

Examples

The following example shows how to use a **clear** command. In this example, the **clear logging** command clears the logging buffer. The **show logging** command verifies that the logging buffer has been cleared.

```
RP/0/RP0/CPU0:router# clear logging

Clear logging buffer [confirm] [y/n] :y

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

Syslog logging: enabled (5 messages dropped, 0 flushes, 0 overruns)
Console logging: level debugging, 201 messages logged
Monitor logging: level debugging, 0 messages logged
Trap logging: level informational, 0 messages logged
Buffer logging: level debugging, 0 messages logged

Log Buffer (16384 bytes):
```

Related Commands

Command	Description
clear (config)	Discards changes to the target configuration that have not yet been committed, without exiting the configuration session.

clear (config)

To discard changes to the target configuration that have not yet been committed without exiting the configuration session, use the **clear** command in any configuration mode.

clear [*feature*]

Syntax Description

feature (Optional) System feature or functionality to reset.

Defaults

No default behavior or values

Command Modes

Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **clear** command in any configuration mode to discard changes to a target configuration session without exiting from global configuration mode.



Tip

The **clear** command can also be used in administration EXEC mode or EXEC mode to reset the contents of a feature. See the **clear (EXEC)** command.

Task ID

This command requires the task ID for the feature or configuration submode impacted by the command.

Examples

The following example shows how to discard uncommitted changes to the target configuration without exiting the configuration session. In the following example, an IPv4 address is configured on Packet-over-SONET/SDH (POS) interface 0/2/0/0. The **show configuration** command displays the uncommitted changes to the target configuration. The **clear** command discards the uncommitted changes. The **show configuration** verifies that the changes made to the target configuration were discarded.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface pos 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)# show configuration
Building configuration...
interface POS0/2/0/0
  ipv4 address 1.1.1.1 255.0.0.0
!
end

RP/0/RP0/CPU0:router(config)# clear
RP/0/RP0/CPU0:router(config)# show configuration
Building configuration...
end
```

Related Commands

Command	Description
abort	Ends a configuration session without saving changes to the target configuration.
clear (EXEC)	Resets command functions in administration EXEC mode or in EXEC mode.
commit	Merges the target configuration to the running configuration.
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 from the terminal session.

clear comment

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

clear comment

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Any configuration

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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
```

clear comment

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

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

Task ID

This command requires the task ID for the feature or configuration submode 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 EXEC or administration 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.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. This command was earlier named clear configuration rollback points .
	Release 3.3.0	Added support for administration EXEC mode.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

clear configuration commits

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.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

clear configuration inconsistency

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

clear configuration inconsistency

Syntax Description This command has no arguments or keywords.

Defaults Administration EXEC mode: Clears the inconsistency alarms for the admin plane configuration.
EXEC mode: Clears the inconsistency alarms for an SDR configuration.

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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, modular services card (MSC), 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/0/0/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/0/0/CPU0:router(config)# hostname router2
RP/0/0/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 startup** command to populate the target configuration with the contents of the previous failed configuration from the startup configuration.

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

SDR Usage

To clear the inconsistency alarms for the admin plane configuration, enter the **clear configuration inconsistency** command in administration EXEC mode.

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

Task ID

Task ID	Operations
config-services	execute

Examples

The following example shows how to clear the inconsistency alarms for the admin plane configuration by entering the **configuration inconsistency** command in administration EXEC mode:

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

Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
Syncing ADMIN commit database with running configuration...OK
Re-initializing cache files...OK
Updating Commit Database. Please wait...[OK]
```

The following example shows how to clear the inconsistency alarms for an SDR configuration. The command is entered in 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
Syncing commit database with running configuration...OK
```

```
Re-initializing cache files...OK
Updating Commit Database. Please wait...[OK]
```

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

```
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 2006
2	alarm	inconsistency alarm cleared	Thu Jun 22 15:42:30 2006
3	alarm	inconsistency alarm raised	Sun Jul 9 13:39:57 2006
4	alarm	inconsistency alarm cleared	Sun Jul 9 14:15:48 2006
5	alarm	inconsistency alarm raised	Sat Jul 15 18:18:26 2006
6	alarm	inconsistency alarm cleared	Sat Jul 15 19:21:03 2006

Related Commands

Command	Description
load configuration failed startup	Populates the target configuration with the contents of the previous failed configuration from the startup configuration.
show configuration failed startup	Displays information about a configuration that failed at startup.
show configuration history alarm	Displays a history of the configuration inconsistency alarms that were set or cleared.

clear configuration inconsistency replica

To resolve configuration inconsistencies on a replica node, use the **clear configuration inconsistency replica** command in EXEC or administration 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 rack/slot/module notation.

Defaults

Administration EXEC mode: Resolves any configuration inconsistencies for the admin plane configuration.

EXEC mode: Resolves any configuration inconsistencies for an SDR configuration.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

In administration EXEC mode, the replica node for the **clear configuration inconsistency replica** command is the standby designated system controller (DSC). In EXEC mode, the replica nodes are the route processors (RPs) or distributed route processors (DRPs) that can become the designated secure domain router system 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 the admin plane configuration, enter the **clear configuration inconsistency replica** command in administration EXEC mode.

To clear configuration inconsistencies for an SDR configuration, enter the **clear configuration inconsistency replica** command in 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 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 configuration inconsistencies on a standby node.

clear configuration sessions

To clear (end) an active configuration session, use the **clear configuration sessions** command in EXEC or administration EXEC mode.

clear configuration sessions *session-id*

Syntax Description	<i>session-id</i>	Identifier for the configuration session to be terminated.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **clear configuration sessions** command to clear a configuration session. This command can be used to end the configuration sessions of another user. Any uncommitted changes to a user's target configuration are discarded.

Use the [show configuration sessions](#) command to identify active configuration sessions.

When a configuration session is cleared, a message is displayed on the terminal of the terminated user. For example:

```
RP/0/0/CPU0:router(config)# This configuration session was terminated by user 'user_a'
from line 'aux0_0_CPU0'
```


Task ID	Task ID	Operations
	config-services	execute

Examples

The following example shows how to clear an active configuration session. In this example, the **show configuration sessions** command displays the active configuration session. The **clear configuration sessions** command clears the active configuration session.

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

Current Configuration Session	Line	User	Date	Lock
00000211-002c409b-00000000	con0_RP1_CPU0	UNKNOWN	Mon Feb 2 01:02:09 2004	

```
RP/0/RP0/CPU0:router# clear configuration sessions 00000211-002c409b-00000000
```

```
session ID '00000211-002cb09b-00000000' terminated
```

Related Commands	Command	Description
	show configuration sessions	Displays the active configuration sessions.

commit

To commit the target configuration to the active (running) configuration, use the **commit** command in any configuration mode.

commit [**replace**] [**best-effort**] [**force**] [**label** *line*] [**comment** *line*] [**confirmed** *seconds* | *minutes* | *minutes*] [**save-running** **filename** *file_path*]

Syntax Description	replace	(Optional) Replaces the entire running configuration with the contents of the target configuration.
	best-effort	(Optional) Merges the target configuration with the running configuration and commits only valid changes (best effort). Some configuration changes might fail due to semantic errors.
	force	(Optional) Forces a commit operation in low-memory conditions.
	label <i>line</i>	(Optional) Assigns a meaningful label. This label is displayed (instead of the autogenerated commit ID) in the output for the show configuration commit list .
	comment <i>line</i>	(Optional) Assigns a comment to a commit. This text comment is displayed in the commit entry displayed in the output for the show configuration commit list command with the optional detail keyword.
	confirmed <i>seconds</i> <i>minutes</i> <i>minutes</i>	(Optional) Commits the configuration on a trial basis for the time specified in seconds or minutes. Note The confirmed option is not available in administration configuration mode.
	save-running filename <i>file_path</i>	(Optional) Saves the running configuration to a specified file.

Defaults The default behavior is pseudo-atomic, meaning that all changes must succeed for the entire commit operation to succeed. If any errors are found, none of the configuration changes take effect.

Command Modes Any configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The replace keyword was added.
	Release 3.3.0	The confirmed <i>minutes</i> keyword and argument were added. The confirmed option is not available in administration configuration mode.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.

Release	Modification
Release 3.6.0	No modification.
Release 3.7.0	Support was added for the save-running filename <i>file_path</i> keywords and argument in global configuration mode.
Release 3.8.0	Support was added for the save-running filename <i>file_path</i> keywords and argument in administration configuration mode.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Changes made during a configuration session are inactive until the **commit** command is entered. By default, the commit operation is pseudo-atomic, and not completely atomic. This means that the router attempts to apply the configuration first. If the configuration fails, the entire configuration is rolled back, meaning that any already applied configuration is also rolled back.

To replace the default numeric ID for the commit, use the optional **label** keyword. This label is displayed (instead of the autogenerated commit ID) in the output for the **show configuration commit list** command.

Enter an optional comment with the **comment** keyword to provide additional information about the commit action. This comment is displayed in the output for the **show configuration commit list** command with the **detail** keyword.

Use the optional **confirmed minutes** keyword and argument to commit a configuration on a trial basis for a minimum of 30 seconds and a maximum of 300 seconds (5 minutes). During the trial configuration period, enter **commit** to confirm the configuration. If **commit** is not entered, then the system reverts to the previous configuration when the trial time period expires. The confirmed option is not available in administration configuration mode.

You can use the **commit** command in conjunction with the **load** command. Load a new configuration with the **load** command, and use the **commit** command with the **replace** keyword to have the loaded configuration become the active (running) configuration.

Use the optional **save-running filename** *file_path* keywords and argument to save the running configuration to a specified file. To configure automatic saving of the configuration file on every commit, use the **configuration commit auto-save** command. If automatic saving of the configuration file is already enabled, specifying **save-running filename** *file_path* with the **commit** command has no additional effect.



Caution

Saving the running configuration to a file is CPU intensive.



Note

If you use the **commit** command without previously loading a target configuration, a blank configuration is committed.

Task ID

This command requires the task ID for the feature or configuration submenu impacted by the command.

Examples

Committing the Target Configuration to the Active Running Configuration

The following example shows how to commit the target configuration to the active running configuration. In the following example, the **commit** command saves changes to the router hostname.

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

```
RP/0/RP0/CPU0:Feb 21 04:42:57.017 : config[65689]: %MGBL-LIBTARCFG-6-COMMIT : Configuration committed by user 'user_a'. Use 'show configuration commit changes 1000000033' to view the changes.
```

Adding a Comment to a Configuration Commit

The following example shows how to use the **commit** command with the optional **comment** keyword and **line** argument to assign a text description to the commit operation. The comment is then displayed in the output of the **show configuration commit list detail** command.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# hostname router2
RP/0/RP0/CPU0:router(config)# commit comment new name for router
```

```
RP/0/RP0/CPU0:Feb 21 04:42:57.017 : config[65689]: %MGBL-LIBTARCFG-6-COMMIT : Configuration committed by user 'user_a'. Use 'show configuration commit changes 1000000226' to view the changes.
```

```
RP/0/RP0/CPU0:router2(config)# end
RP/0/RP0/CPU0:router2# show configuration commit list detail
```

```
1) CommitId: 1000000226          Label: NONE
   UserId:   user_a              Line:  con0_RP1_CPU0
   Client:   CLI                 Time:  12:59:26 UTC Wed Feb 04 2004
   Comment:  new name for router

2) CommitId: 1000000225          Label: NONE
   UserId:   user_a              Line:  con0_RP1_CPU0
   Client:   CLI                 Time:  12:58:32 UTC Wed Feb 04 2004
   Comment:  NONE
```

Changing the Commit ID to a Text Label

The following example shows how to use the **commit** command with the optional **label** keyword and **line** argument to change the commit ID to a text label for easier identification. The label is then displayed in the output of the **show configuration commit list** command.

```
RP/0/RP0/CPU0:router2# configure
RP/0/RP0/CPU0:router2(config)# hostname router3
RP/0/RP0/CPU0:router2(config)# commit label new_name
```

```
RP/0/RP0/CPU0:Feb 21 04:42:57.017 : config[65689]: %MGBL-LIBTARCFG-6-COMMIT : Configuration committed by user 'user_a'. Use 'show configuration commit changes 1000000227' to view the changes.
```

```
RP/0/RP0/CPU0:router3(config)# end
RP/0/RP0/CPU0:router3# show configuration commit list
```

SNo.	Label/ID	User	Line	Client	Time Stamp
1	new_name	user_a	con0_RP1_C	CLI	13:00:53 UTC Wed Feb 04 2004
2	1000000226	user_a	con0_RP1_C	CLI	12:59:26 UTC Wed Feb 04 2004
3	1000000225	user_a	con0_RP1_C	CLI	12:58:32 UTC Wed Feb 04 2004

Commit a Configuration for a Specified Time

The following example shows how to use the **commit** command with the optional **confirmed** keyword and *number* argument. The configuration changes are committed only for the specified number of seconds. You can then either confirm the commit operation or discard the changes.

```
RP/0/RP0/CPU0:router2# configure
RP/0/RP0/CPU0:router2(config)# hostname router3
RP/0/RP0/CPU0:router2(config)# commit confirmed 30
RP/0/RP0/CPU0:router3(config)# end
```

Related Commands

Command	Description
abort	Ends a configuration session without saving changes to the target configuration.
clear (EXEC)	Resets command functions in administration EXEC mode or in EXEC mode.
clear (config)	Discards changes to the target configuration that have not yet been committed, without exiting the configuration session.
configuration commit auto-save	Configures automatic saving of the running configuration to a specified file on every commit.
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.
load	Populates the target configuration with the contents of a previously saved configuration file.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

configuration commit auto-save

To enable automatic saving of the running configuration to a specified file on every commit, use the **configuration commit auto-save** command in global configuration mode. To disable automatic saving of the running configuration to a specified file on every commit, use the **no** form of the command.



Caution

Saving the running configuration to a file is CPU intensive.

configuration commit auto-save filename *file_path*
no configuration commit auto-save

Syntax Description	filename <i>file_path</i> Specifies the location to which to save the running configuration.

Defaults	No default behavior or values

Command Modes	Global configuration Administration configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.8.0	This command was first supported in administration configuration mode.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **configuration commit auto-save** command configures the system to save the running configuration to the specified file and location every time a **commit** command is run. Alternatively, you can save the configuration on a one-time basis by specifying the **save-running** keyword when you run the **commit** command.

Task ID	Task ID	Operations
	config-services	write

Examples

The following example shows how to configure the system to save the running configuration to the file disk0:/usr whenever the **commit** command is used:

```
RP/0/RP0/CPU0:router(config)# configuration commit auto-save filename disk0:/usr
```

Related Commands

Command	Description
commit	Merges the target configuration to the running configuration.

configure

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

Defaults

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

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

Global Configuration Mode

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

Administration Configuration Mode

Use the **configure** command in administration EXEC mode to enter administration configuration mode and create a new target configuration. From administration configuration mode, you can enter any administration configuration submode. Configuration changes entered in administration configuration 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 administration configuration 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 EXEC or Administration 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 EXEC or administration EXEC prompt, issue the **end** or **exit** command; you are prompted to commit any uncommitted changes.

To leave configuration mode and return directly to EXEC or administration 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 EXEC mode and then enter interface configuration submode to configure an IPv4 address for Packet-over-SONET/SDH (POS) interface 0/1/0/0. In the example, the **commit** command commits the configuration, and the **end** command terminates the configuration session and return the router to EXEC mode.

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

The following example shows how to enter administration configuration mode and then configure an SDR. In this example, the user also enters SDR configuration submode. This example is for a Cisco XR 12000 Series Router.

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/0/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/5/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# end
```

Related Commands

Command	Description
abort	Ends a configuration session without saving changes to the target configuration.
clear (EXEC)	Resets command functions in administration EXEC mode or in EXEC mode.
clear (config)	Discards changes to the target configuration that have not yet been committed, without exiting the configuration session.
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.
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 *comment*

no description

Syntax Description

<i>comment</i>	Comment or a description applied to the interface. The maximum number of characters is 1022.

Defaults

No description is configured.

Command Modes

Interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

■ description (interface)

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.

```
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)# description Management Ethernet Interface
```

Related Commands

Command	Description
show interfaces	Displays statistics for all interfaces configured on the router or access server.

do

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

do *exec-command*

Syntax Description	<i>exec-command</i>	EXEC mode command to be executed.

Defaults	No default behavior or values

Command Modes	Any configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Use the **do** command in any configuration mode or configuration submode to execute EXEC mode commands.

To display the various 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 under the **do** command.

Task ID	Task ID	Operations
	Task ID for the EXEC command that you are using	read

Examples

The following example shows how to execute an 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 pos 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 EXEC or administration EXEC mode, use the **end** command in any configuration mode.

end

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	Any configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Use the **end** command to exit any configuration mode and return directly to EXEC or administration 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 EXEC or administration 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 EXEC or administration 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 EXEC or administration 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 pos 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.
commit	Merges the target configuration to the running configuration.
clear (config)	Discards changes to the target configuration that have not yet been committed, without exiting the configuration session.
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.
show configuration (config)	Displays the contents of the target configuration.

end-template

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

end-template

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values.

Command Modes	Template configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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** keyword and *template-name* 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 EXEC or administration 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 arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC Any configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Use the **exit** command to exit any configuration mode from the current configuration mode to the next higher command mode.

To log off from a terminal session, enter the **exit** command in EXEC or administration EXEC mode.

When exiting from global or administration configuration mode to EXEC or administration 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 EXEC or administration 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 EXEC or administration 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 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 pos 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 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.
commit	Merges the target configuration to the running 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 global configuration mode.

hostname *name*

Syntax Description

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

Defaults

The factory-assigned default hostname is “ios.”

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The hostname is used in prompts and default configuration filenames.

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

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to change the router hostname:

```
RP/0/RP0/CPU0:router(config)# hostname crs1
```

load

To populate the target configuration with the contents of a previously saved configuration file, use the **load** command in global configuration or administration configuration mode.

load *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.

Defaults

If the full path of the file is not specified, the present working directory is used.

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **load** command to populate the target configuration with the contents of a previously saved configuration. When loading a file, you must specify the device, directory path, and filename of the configuration file.

Use the **commit** command in conjunction with the **load** command. Load a new configuration with the **load** command, and use the **commit** command with the **replace** keyword to have the loaded configuration become the active (running) configuration.

Use the **show configuration failed (config)** command with the optional **load** keyword to display syntax errors that occurred during the last load operation.

Task ID**Task ID****Operations**

config-services

read, write

Examples

The following example shows how to load a target configuration file into the current configuration session. The current configuration session is then populated with the contents of the file.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# load disk1:myconfig.cfg
RP/0/RP0/CPU0:router(config)# show config
```

```
Building configuration...
interface POS 0/3/0/0
  description My Pos Interface
  ipv4 address 10.10.11.20 255.0.0.0
!
end
```

Related Commands**Command****Description****commit**

Merges the target configuration to the running configuration.

**show configuration
failed load**

Displays syntax errors that occurred during the last load operation.

load commit changes

To populate the target configuration with changes from previous configuration commits, use the **load commit changes** command in global configuration or administration configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	Added support for administration configuration mode.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **load commit changes** 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.

load commit changes

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 global configuration or administration configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	Support was added for the keyword commit . Support was added for the keyword startup . Support was added for the keyword and argument previous <i>number-of-reloads</i> . Support was added for the keyword noerror .
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

load configuration failed

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
```

Related Commands	Command	Description
	show configuration (config)	Use the show configuration failed command in EXEC mode to display the failed items in the last configuration commit, including reasons for the error.

load configuration removed

To populate the target configuration with the contents of the previous removed configuration, use the **load configuration removed** command in global configuration or administration configuration mode.

load configuration removed *config-id*

Syntax Description	<i>config-id</i>	Identifier of the removed configuration to load.

Command Modes	Global configuration Administration configuration

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>Release 3.5.0</td><td>This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.</td></tr><tr><td>Release 3.6.0</td><td>No modification.</td></tr><tr><td>Release 3.7.0</td><td>No modification.</td></tr><tr><td>Release 3.8.0</td><td>No modification.</td></tr></table>	Release	Modification	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.	Release 3.6.0	No modification.	Release 3.7.0	No modification.	Release 3.8.0	No modification.
Release	Modification										
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.										
Release 3.6.0	No modification.										
Release 3.7.0	No modification.										
Release 3.8.0	No modification.										

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>. Use the load configuration removed command to populate the target configuration with the contents of the removed configuration during installation operations.

Task ID	<table><tr><th>Task ID</th><th>Operations</th></tr><tr><td>config-services</td><td>read, write</td></tr></table>	Task ID	Operations	config-services	read, write
Task ID	Operations				
config-services	read, write				

Examples	The following example shows how to populate the target configuration with the contents of the removed configuration during installation: <pre>RP/0/RP0/CPU0:router(config)# load configuration removed 20070316021626.cfg</pre>

Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>show configuration persistent</td><td>Displays the configuration removed during installation operations.</td></tr></table>	Command	Description	show configuration persistent	Displays the configuration removed during installation operations.
Command	Description				
show configuration persistent	Displays the configuration removed during installation operations.				

load rollback changes

To populate the target configuration with the contents of a previous configuration, use the **load rollback changes** command in global configuration or administration configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	Added support for administration configuration mode.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The Cisco IOS XR software provides online help for standard Cisco IOS XR command-line interface (CLI) commands using manual (man) pages. To display manual pages, use the **man** command in 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	Displays all commands in the feature. Use the man feature command to list the available feature names.
<i>feature-name</i>	(Optional) Feature name to match. The <i>feature-name</i> argument does not display man pages, but displays a list of command names that match the feature name.
keyword <i>keywords</i>	Enters 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. The <i>keywords</i> argument does not display man pages, but displays a list of command names that match the keywords.

Defaults

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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, refer to the *Upgrading and Managing Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

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** keyword and *feature-name* argument display all commands that match the feature. For example, entering **man feature hfr-base-1** displays all commands that match the hfr-base-1 feature. The **keyword** keyword and *keywords* argument display all commands that contain the 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.

more

To display the contents of a file, use the **more** command in EXEC or administration EXEC mode.

more [/ascii | /binary | /ebcdic] *filesystem:directory-path* [**location** *node-id* | **location** **all**]

Syntax Description	/ascii	(Optional) Displays a binary file in ASCII format.
	/binary	(Optional) Displays a file in hexadecimal or text format.
	/ebcdic	(Optional) Displays a binary file in ebcdic format.
	<i>filesystem:directory-path</i>	File system location of the file to be displayed. Include the file system alias for the <i>filesystem</i> argument, followed by a colon, and the directory path of the file to be displayed.
	location <i>node-id</i>	(Optional) Displays the contents of a file on a designated node.
	location all	(Optional) Displays the contents of a file from all nodes.

Defaults No default behavior or values

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **more** command to display any text file, especially an ASCII file stored on the router or accessible through the network. The file can be a configuration file or any other text file.

Filtering Output

The output displayed by the **more** command can be filtered using the options shown in [Table 18](#).

Table 18 **Filtering Options**

Command	Purpose
more filesystem: begin <i>regular-expression</i>	Begins unfiltered output of the more command with the first line that contains the regular expression.
more filesystem: exclude <i>regular-expression</i>	Displays output lines that do not contain the regular expression.
more filesystem: include <i>regular-expression</i>	Displays output lines that contain the regular expression.

Adding a Filter at the --More-- Prompt

You can also specify a filter at the --More-- prompt of a **more** command output. To filter output from the --More-- prompt, enter a forward slash (/) followed by a regular expression. The filter remains active until the command output finishes or is interrupted (using **Ctrl-Z** or **Ctrl-C**).

- A second filter cannot be specified at a --More-- prompt if a filter has already been specified at the original command or at a previous --More-- prompt.
- The minus sign (–) preceding a regular expression displays output lines that do not contain the regular expression.
- The plus sign (+) preceding a regular expression displays output lines that contain the regular expression.



Note

After you specify a filter for a **more** command, you cannot specify another filter at the next --More-- prompt. The first specified filter remains until the **more** command output finishes or until you interrupt the output. The use of the **begin** keyword does not constitute a filter.

Task ID

Task ID	Operations
filesystem	execute

Examples

The following is partial sample output from the **more** command. The output displays a configuration file saved on the hard disk drive.

```
RP/0/RP0/CPU0:router# more harddisk:/user/alternate.cfg

!! Last configuration change at 15:52:55 UTC Fri Feb 13 2004 by UNKNOWN
!
line console
  exec-timeout 0 0
!
interface MgmtEth0/RP1/CPU0/0
  ipv4 address 10.32.45.154 255.0.0.0
!
interface POS0/1/0/0
  ipv4 address 10.32.45.155 255.0.0.0
  keepalive disable
!
```

■ **more**

```
interface POS0/1/0/1
  ipv4 address 10.32.45.156 255.0.0.0
  keepalive disable
!
interface POS0/1/0/2
/ ip
  ipv4 address 10.32.45.157 255.0.0.0
  keepalive disable
!
interface POS0/1/0/3
  ipv4 address 10.32.45.158 255.0.0.0
  keepalive disable
!
interface POS0/2/0/0
  ipv4 address 10.32.45.159 255.0.0.0
  keepalive disable
!
--More--
```

The following is partial sample output from the **more disk0:config.backup | begin ipv4** command. The output begins with unfiltered output from the first line that contains the regular expression “ipv4.” In this example, a new search is specified that begins with output lines that contain the regular expression “ipv4.”

```
RP/0/RP0/CPU0:router# more disk0:config.backup | begin ipv4
```

```
  ipv4 address 2.2.2.2 255.255.255.255
!
interface pos0/3/1/0
  shutdown
!
interface pos0/3/1/2
  shutdown
!
interface POS0/2/1/0
  ipv4 address 1.1.1.1 255.255.255.0
  keepalive disable
!
interface POS0/2/1/1
  ipv4 address 1.1.1.1 255.255.255.0
  keepalive disable
!
interface POS0/2/1/2
  ipv4 address 1.1.1.1 255.255.255.0
  keepalive disable
!
interface POS0/2/1/3
  shutdown
!
/ipv4
filtering...
  ipv4 address 1.1.1.1 255.255.255.0
  proxy-arp disable
  shutdown
!
interface pos 0/1/0/0
  ipv4 address 1.1.1.1 255.255.255.0
  proxy-arp disable
!
route ipv4 0.0.0.0/0 12.25.26.5
route ipv4 223.255.254.254/32 12.25.0.1
end
```

The following is partial sample output of the **more** command on the sample file config.backup in disk0:. The command usage is **more disk0:config.backup | include log**. At the --More-- prompt, a new search is specified that begins with output lines that contain the regular expression “aaa.”

```
RP/0/RP0/CPU0:router# more disk0:config.backup | include log

logging trap
logging trap informational
logging console debugging
logging history size 1
.
.
.

/aaa
filtering...
aaa authentication login default none
```

The following is partial sample output from the **more disk0:myconfig/file | exclude** command. The output excludes lines that contain the regular expression “alias.” In this example, at the --More-- prompt, a new search is specified, beginning with output lines that contain the regular expression “ipv4 address.”

```
RP/0/RP0/CPU0:router# more disk0:myconfig/file | exclude alias

Building configuration...
!! Last configuration change at 18:17:00 UTC Thu May 16 2004 by lab
!
hostname router
line console
  exec-timeout 0 0
  width 132
  length 0
  session-timeout 0
/ipv4 address
filtering...
ipv4 address 10.10.1.1 255.255.255.255
!
interface Loopback200
  ipv4 address 10.20.1.1 255.255.255.255
!
interface pos0/0/0/0
  ipv4 address 10.30.1.1 255.255.0.0
  keepalive 100
!
interface preconfigure POS0/1/0/1
  shutdown
end
```

Related Commands

Command	Description
show	Displays system status and configuration.

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 arguments or keywords.

Defaults No default behavior or values

Command Modes Any subconfiguration mode

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **pwd** command to determine within which configuration submode you are currently located.

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 pos 0/6/4/5
RP/0/RP0/CPU0:router(config-if)# pwd

interface POS0/6/4/5
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 EXEC or administration EXEC mode.

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

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>comment</i>	(Optional) Assigns a text comment to this rollback. <i>comment</i> can be up to 60 characters long.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	This command was added to administration EXEC mode.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

Task ID**Task ID Operations**

root-lr (EXEC)	read, write
root-system (administration 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_RP0_C	Rollback	02:41:08 UTC Sun Sep 26 2004
2	1000000008	lab	con0_RP0_C	CLI	02:40:30 UTC Sun Sep 26 2004
3	1000000007	lab	con0_RP0_C	CLI	02:39:54 UTC Sun Sep 26 2004
4	1000000006	lab	con0_RP0_C	Rollback	02:38:40 UTC Sun Sep 26 2004
5	1000000005	lab	con0_RP0_C	CLI	02:37:35 UTC Sun Sep 26 2004
6	1000000004	lab	con0_RP0_C	CLI	02:37:04 UTC Sun Sep 26 2004
7	1000000003	lab	con0_RP0_C	CLI	02:34:53 UTC Sun Sep 26 2004
8	1000000002	UNKNOWN	con0_RP0_C	CLI	23:51:30 UTC Fri Sep 24 2004
9	1000000001	UNKNOWN	con0_RP0_C	CLI	23:08:31 UTC Fri Sep 24 2004

```
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 100000010' to view the changes.
```

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

Rolling Back to a Span of Configuration Commits

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

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

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

Related Commands

Command	Description
load rollback changes	Populates the target configuration with the contents of a previous configuration.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

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.

Defaults

No default behavior or values

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 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **root** command to return directly to configuration mode from any configuration submode.

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 pos 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 global configuration or administration configuration mode.

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

Syntax Description	running	(Optional) 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.

Defaults	No default behavior or values

Command Modes	Global configuration Administration configuration

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

To save a configuration to a file, use the **save configuration** *device:directory-path* 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 EXEC 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]
```

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

The following example shows the configuration saved to disk1 from administration EXEC mode:

```
RP/0/RP0/CPU0:router(admin-config)# save configuration disk1:sample4
```

```
Destination file name (control-c to abort): [/sample4]?
```

```
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 a failed configuration.
save configuration merge	Saves the changes for a merged configuration to a file.
save configuration removed	Saves the contents of a removed configuration to a file.
save rollback changes	Saves rollback changes for a commit ID or a group of commits.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

save configuration changes

To save the changes of a configuration to a file, use the **save configuration changes** command in global configuration or administration configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.4.0	No modification.
Release 3.5.0	This command was added to administration configuration mode.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 EXEC 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]
```

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

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 a failed configuration.
save configuration merge	Saves the changes for a merged configuration to a file.
save configuration removed	Saves the contents of a removed configuration to a file.
save rollback changes	Saves rollback changes for a commit ID or a group of commits.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

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 global configuration or administration configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration
 Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

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.
save configuration failed	Saves the contents of a failed configuration.
save configuration merge	Saves the changes for a merged configuration to a file.
save configuration removed	Saves the contents of a removed configuration to a file.
save rollback changes	Saves rollback changes for a commit ID or a group of commits.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration history	Display history of configuration changes.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

save configuration failed

To save the contents of the failed configuration, use the **save configuration failed** command in global configuration or administration configuration mode.

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

Syntax Description	load	(Optional) Saves the failed configuration (syntax errors) in the last reload.
	noerror	(Optional) Saves the failed items in the last commit (excludes the error reasons).
	startup	(Optional) Saves the failed configuration during startup.
	previous <i>number</i>	(Optional) 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.
	<i>device:directory-path</i>	Storage device and directory path of the configuration file to be saved.

Defaults No default behavior or values

Command Modes Global configuration
Administration configuration

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.4.0	No modification.
	Release 3.5.0	The startup keyword was added in administration configuration mode.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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(admin-config)# save configuration failed disk1:/configs
```

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.
save configuration merge	Saves the changes for a merged configuration to a file.
save configuration removed	Saves the contents of a removed configuration to a file.
save rollback changes	Saves rollback changes for a commit ID or a group of commits.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration history	Display history of configuration changes.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

save configuration merge

To save the contents of a merged configuration to a file, use the **save configuration** command in global configuration or administration configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

To save a merged configuration to a file, use the **save configuration merge** *device:directory-path* command.

Task ID

Task ID	Operations
config-services	read

Examples

The following example shows the configuration saved to disk0:

```
RP/0/RP0/CPU0:router(admin-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 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.
	save configuration failed	Saves the contents of a failed configuration.
	save configuration removed	Saves the contents of a removed configuration to a file.
	save rollback changes	Saves rollback changes for a commit ID or a group of commits.
	show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
	show configuration commit list	Displays information about the configuration commits stored in the commit database.
	show configuration history	Display history of configuration changes.
	show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

save configuration removed

To save the contents of a removed configuration to a file, use the **save configuration removed** command in global configuration or administration configuration mode.

save configuration removed {*removed-configuration-file*} *device:directory-path*

Syntax Description

<i>removed-configuration-file</i>	Specifies the name of the removed configuration file.
<i>device:directory-path</i>	Storage device and directory path of the configuration file to be loaded into the target configuration.

Defaults

No default behavior or values

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

When a package is deactivated, the configuration belonging to that package is removed from the running configuration and saved to a file. To save a copy of the removed configuration file, use the **save configuration removed** {*removed-configuration-file*} *device:directory-path* command.

Task ID

Task ID	Operations
config-services	read

Examples

To view a list of the available removed configuration files, use the **save configuration removed** command followed by a question mark:

```
RP/0/RP0/CPU0:router(config)# save configuration removed ?

20051208042507.cfg  Removed configuration.
20051208044553.cfg  Removed configuration.
<cr>
```

In the following example, a removed configuration is saved to disk0 and assigned the filename “sample3”:

```
RP/0/RP0/CPU0:router(config)# save configuration removed 20051208042507.cfg 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	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.
save configuration failed	Saves the contents of a 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 commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration history	Display history of configuration changes.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

save rollback changes

To save the rollback changes, use the **save rollback changes** command in global configuration or administration configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration
Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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(admin-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.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration history	Display history of configuration changes.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

set default-afi

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

Defaults

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

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 settings for the current session.
show default-afi-safi-vrf	Displays the default AFI, SAFI, and VRF settings 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 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.

Defaults

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

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 route** 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 settings for the current session.
set default-vrf	Sets the default VRF settings for the current session.
show default-afi-safi-vrf	Displays the default AFI, SAFI, and VRF settings 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 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.

Defaults The default VRF setting is set to empty.

Command Modes EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	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.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/0/0/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. Because the default VRF was set to “dft_vrf”, the results for that VRF are displayed.

```
RP/0/0/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 **none** (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/0/0/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 settings 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 settings for the current session.

show

To display information about the system configuration or operational state, use the **show** command in EXEC mode, administration EXEC mode, or any configuration mode.

show *command* [**|** **begin** *regular-expression* **|** **exclude** *regular-expression* **|** **file** *filesystem:* **|** **include** *regular-expression*]

Syntax Description

<i>command</i>	Supported show command.
 	Vertical bar (the “pipe” symbol) indicates that an output processing specification follows.
<i>regular-expression</i>	(Optional) Regular expression found in show command output.
begin	(Optional) Begins unfiltered output of the show command with the first line that contains the regular expression.
exclude	(Optional) Displays output lines that do not contain the regular expression.
file <i>filesystem:</i>	(Optional) Writes the output lines that contain the regular expression to the specified file on the specified file system. Include the file system alias for the <i>filesystem</i> argument, followed by a colon, and the directory path and filename.
include	(Optional) Displays output lines that contain the regular expression.

Defaults

No defaults behavior or values

Command Modes

EXEC
Administration EXEC
Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show** commands display information about the system and its configuration. To display a list of the available **show** commands, use the question mark (?) online help function.

Filtering Output

Table 19 shows the search options for the **show** command.

Table 19 Show Command Search Options

Command	Purpose
show command begin <i>regular-expression</i>	Begins unfiltered output of the show command with the first line that contains the regular expression.
show command exclude <i>regular-expression</i>	Displays output lines that do not contain the regular expression.
show command include <i>regular-expression</i>	Displays output lines that contain the regular expression.
show command file <i>filesystem:</i>	Writes the output lines that contain the regular expression to the specified file on the specified file system.

Adding a Filter at the --More-- Prompt

You can also specify a filter at the --More-- prompt of a **show** command output. To filter output from the --More-- prompt, enter a forward slash (/) followed by a regular expression. The filter remains active until the command output finishes or is interrupted (using **Ctrl-Z** or **Ctrl-C**).

- If a filter is specified at the original command or a previous --More-- prompt, a second filter cannot be applied.
- The use of the keyword **begin** does not constitute a filter.
- The minus sign (–) preceding a regular expression displays output lines that do not contain the regular expression.
- The plus sign (+) preceding a regular expression displays output lines that contain the regular expression.

Task ID

This command requires the task ID for the feature used with the **show** command. For example, the command **show interfaces** requires read privileges in the interface task ID.

Examples

The following example shows output from the **show interface | include protocol** command. In this example, the **show interface** command includes only lines in which the regular expression “protocol” appears:

```
RP/0/RP0/CPU0:router# show interface | include protocol

Null0 is up, line protocol is up
0 drops for unrecognized upper-level protocol
```

```

POS0/2/0/0 is administratively down, line protocol is administratively down
0 drops for unrecognized upper-level protocol
POS0/2/0/1 is administratively down, line protocol is administratively down
0 drops for unrecognized upper-level protocol
POS0/2/0/2 is administratively down, line protocol is administratively down
0 drops for unrecognized upper-level protocol
POS0/2/0/3 is administratively down, line protocol is administratively down
0 drops for unrecognized upper-level protocol
FastEthernet0/RP0/CPU0/0 is administratively down, line protocol is administratively
down
FastEthernet0/RP0/CPU0/0 is administratively down, line protocol is administratively
down
0 drops for unrecognized upper-level protocol
    
```

On most systems, the **Ctrl-Z** key combination can be entered at any time to interrupt the output and return to EXEC mode. For example, issue the **show running-config | begin hostname** command to start the display of the running configuration file at the line containing the hostname setting, then use **Ctrl-Z** when you get to the end of the information you are interested in.

The following is sample output from the **show configuration running | begin line** command. The output begins with unfiltered output from the first line that contains the regular expression “line.” In this example, at the --More-- prompt, a new search is specified that begins with output lines that contain the regular expression “ipv4.”



Note

The use of the keyword **begin** does not constitute a filter.

```

RP/0/RP0/CPU0:router# show configuration running | begin line

Building configuration...
line console
  exec-timeout 120 120
!
logging trap
--More--
/ipv4
filtering...
route ipv4 0.0.0.0 255.255.0.0 pos0/2/0/0
interface pos0/2/0/0
  ipv4 address 172.19.73.215 255.255.0.0
end
    
```

Related Commands

Command	Description
more	Displays output from a text file.

show aliases

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

show aliases

Syntax Description	This command has no arguments or keywords.

Defaults	Displays all aliases currently configured on the system.

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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

Task ID	Task ID	Operations
	basic-services	read

Examples	The following is 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:
```

show aliases

```
ipv4_brief          show ipv4 interface brief

interface mode aliases:
  sample_int        pos 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.

Defaults

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

Command Modes

Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 merge** command from any configuration mode to display the result of merging the target configuration with the running configuration.

■ show configuration (config)

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 POS0/3/0/3
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 POS0/3/0/3
  description faq
  ipv4 address 10.10.11.20 255.0.0.0
end
```

The following is sample output from the **show configuration** command with the optional **merge** keyword. In the following example, the **show configuration merge** command is entered during an 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 POS0/3/0/3
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 POS0/0/0/0
  ipv4 address 1.2.3.4 255.0.0.0
exit
interface POS0/3/0/3
  description faq
  ipv4 address 1.1.1.1 255.0.0.0
  shutdown
end
```

Related Commands

Command	Description
commit	Merges the target configuration to the running configuration.
load	Populates the target configuration with the contents of a previously saved configuration file.
show configuration running	Displays the contents of the committed configuration.
show configuration running-config	Displays the contents of the committed configuration.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.

Command	Description
show configuration history	Display history of configuration changes.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration failed startup	Displays information about a configuration that failed at startup.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
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 global configuration or administration configuration mode.

show configuration changes [diff]

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

Defaults	No default behavior or values

Command Modes	Global configuration Administration configuration

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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/0/0/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
- !
- interface POS0/3/0/0
-  description
-  shutdown
- !
- interface POS0/4/0/0
-  shutdown
- !
- router static
-  address-family ipv4 unicast
-    0.0.0.0/0 255.255.255.224
-  !
- !
- xml agent tty
end
```

show configuration commit changes

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

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

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

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC Administration configuration Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. Command name was modified to include the configuration keyword. This command was previously named show commit changes .
	Release 3.3.0	Support was added for administration EXEC and administration configuration modes. Support was added for the keyword diff .
	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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

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

Task ID

Task ID	Operations
config-services	read

Examples

The following is sample output from the **show configuration commit list** command. The output displays commit IDs.

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

SNo.	Label/ID	User	Line	Client	Time Stamp
~~	~~~~~	~~~~	~~~~	~~~~~	~~~~~
1	1000000077	lab	con0_RP1_C	CLI	15:42:45 UTC Fri Jan 30 2004
2	1000000076	lab	con0_RP1_C	Rollback	15:30:39 UTC Fri Jan 30 2004
3	1000000075	lab	con0_RP1_C	Rollback	15:25:26 UTC Fri Jan 30 2004
4	1000000074	lab	con0_RP1_C	Rollback	15:04:29 UTC Fri Jan 30 2004
5	1000000073	lab	con0_RP1_C	CLI	14:49:07 UTC Fri Jan 30 2004
6	1000000072	lab	con0_RP1_C	CLI	14:48:35 UTC Fri Jan 30 2004

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

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

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

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

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

```
Building configuration...
no hw-module node 0/RP0/CPU0 shutdown
hostname router
logging trap
no logging console
logging history size 1
alias exec shrun show configuration running
alias exec shver show version
```

■ show configuration commit changes

```
interface MgmtEth0/RP1/CPU0/0
  ipv4 address 12.25.34.10 255.255.0.0
  no shutdown
!
interface preconfigure MgmtEth0/RP0/CPU0/0
  no shutdown
!
no route ipv4 0.0.0.0/0 12.7.0.1
route ipv4 0.0.0.0/0 12.25.0.1
route ipv4 223.255.254.254/32 12.25.0.1
telnet ipv4 server enable
end
```

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

+ indicates an added line.

- indicates a deleted line.

indicates a modified line.

```
router# show configuration commit changes last 1 diff
```

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

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

Related Commands

Command	Description
rollback configuration	Rolls back the configuration to a previous commit.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.

show configuration commit list

To display information about the configuration commits stored in the commit database, use the **show configuration commit list** command in EXEC, administration EXEC, administration configuration, or global configuration mode.

show configuration commit list [*number-of-commits*] [**detail**]

Syntax Description

<i>number-of-commits</i>	(Optional) Number of commits (beginning with the most recent commit) that are available for rollback.
detail	(Optional) Displays detailed commit information, including comments.

Defaults

If this command is entered without any optional arguments or keywords, the output displays information about all the configuration commits stored in the commit database.

Command Modes

EXEC
Administration EXEC
Administration configuration
Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. This command replaces the show rollback points command, which was available in previous releases.
Release 3.3.0	Support was added for the administration EXEC and administration configuration modes.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show configuration commit list** command to list the commit IDs (up to 100) that are available for rollback.

show configuration commit list



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.

Task ID

Task ID Operations

config-services	read

Examples

The following is sample output from the **show configuration commit list** command. The output displays the commit IDs that are available for rollback.

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

SNo.	Label/ID	User	Line	Client	Time Stamp
1	1000000010	UNKNOWN	con0_RP1_C	Rollback	02:25:53 UTC Fri Feb 06 2004
2	1000000009	UNKNOWN	con0_RP1_C	CLI	02:23:09 UTC Fri Feb 06 2004
3	1000000008	UNKNOWN	con0_RP1_C	CLI	02:22:54 UTC Fri Feb 06 2004
4	1000000007	UNKNOWN	con0_RP1_C	CLI	02:22:18 UTC Fri Feb 06 2004
5	1000000006	UNKNOWN	con0_RP1_C	CLI	02:07:21 UTC Fri Feb 06 2004
6	1000000005	UNKNOWN	con0_RP1_C	CLI	01:59:50 UTC Fri Feb 06 2004
7	1000000004	UNKNOWN	con0_RP1_C	CLI	01:58:13 UTC Fri Feb 06 2004
8	1000000003	UNKNOWN	con0_RP1_C	CLI	01:58:04 UTC Fri Feb 06 2004
9	1000000002	UNKNOWN	con0_RP1_C	CLI	10:41:31 UTC Wed Feb 04 2004
10	1000000001	UNKNOWN	con0_RP1_C	CLI	10:41:14 UTC Wed Feb 04 2004

Table 20 describes the significant fields shown in the display.

Table 20 *show configuration commit list Field Descriptions*

Field	Description
SNo.	Serial number of the commit entry.
Label/ID	If a label was assigned to a commit, the first 10 characters of the label display; otherwise, the autogenerated commit ID displays.
User	User who executed the commit.
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.
Client	The management interface used to make the commit.
Time Stamp	Time and date when the commit was executed.

Related Commands

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

Command	Description
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration history	Display history of configuration changes.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration failed startup	Displays information about a configuration that failed at startup.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

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.

Defaults

Displays the details of the failed configuration including error reasons.

Command Modes

Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.1	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 is sample output from the **show configuration** command with the optional **failed** keyword. 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 is sample output from the **show configuration** command with the optional **failed** and **no errors** keywords. 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 running	Displays the contents of the committed configuration.
show configuration running-config	Displays the contents of the committed configuration.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration history	Display history of configuration changes.
show configuration failed startup	Displays information about a configuration that failed at startup.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

show configuration failed incompatible

To display any configurations that were removed from the running configuration because they were not understood by the software being activated, use the **show configuration failed incompatible** command in EXEC or administration EXEC mode.

show configuration failed incompatible

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Any configurations in the running configuration that are not understood by new software being installed are removed from the running configuration. To see which configurations were removed, use the **show configuration failed incompatible** command.

Task ID	Task ID	Operations
	config-services	read

Related Commands	Command	Description
	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 EXEC or administration EXEC mode.

show configuration failed remove

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	config-services	read

Examples The following example shows a failed commit operation:

```
RP/0/0/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
```

■ show configuration failed remove

```
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/0/0/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 running	Displays the contents of the committed configuration.
show configuration running-config	Displays the contents of the committed configuration.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration history	Display history of configuration changes.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

show configuration failed rollback

To display information about a configuration that failed in the last rollback operation, use the **show configuration failed rollback** command in EXEC or administration EXEC mode.

show configuration failed rollback

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was first introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	config-services	read
	root-lr	read

Related Commands	Command	Description
	show configuration (config)	Displays the contents of the target configuration.
	show configuration running	Displays the contents of the committed configuration.
	show configuration running-config	Displays the contents of the committed configuration.

■ show configuration failed rollback

Command	Description
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration history	Display history of configuration changes.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
show configuration sessions	Displays the active configuration sessions.
show running-config	Displays the current running (active) configuration.

show configuration failed startup

To display information about a configuration that failed at startup, use the **show configuration failed** command in EXEC or administration EXEC mode.

show configuration failed startup [**noerror** | **previous** *number*]

Syntax Description	noerror	(Optional) Displays the configuration that failed at startup without an error reason.
	previous <i>number</i>	(Optional) Displays the previous failed startup configuration or configurations. The <i>number</i> argument is a value from 1 to 4, which displays the failed startup configurations in previous <i>number</i> of sessions.

Defaults	If no keywords are specified, this command displays the details of the failed startup configuration including error reasons.

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.1	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.2	No modification.
	Release 3.3.0	Support was added for the previous <i>number</i> keyword and argument.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	config-services	read

■ show configuration failed startup

Related Commands	Command	Description
	show configuration (config)	Displays the contents of the target configuration.
	show configuration running	Displays the contents of the committed configuration.
	show configuration running-config	Displays the contents of the committed configuration.
	show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
	show configuration commit list	Displays information about the configuration commits stored in the commit database.
	show configuration history	Display history of configuration changes.
	show configuration failed (config)	Displays information about a configuration that failed during the last commit.
	show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
	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 EXEC, administration EXEC, administration configuration, or global configuration 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.
detail	(Optional) Displays detailed information, including comments.
first number	(Optional) Displays the first <i>x</i> events. Replace <i>number</i> with the number of events to display.
last number	(Optional) Displays the last <i>x</i> events. Replace <i>number</i> with the number of events to display.
rebase	(Optional) Displays commit database consolidation events.
reverse	(Optional) Displays the most recent events first.
shutdown	(Optional) Displays shutdown events.
startup	(Optional) Displays startup events, including alternate configurations, failed configurations, and other events.

Defaults 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

- EXEC
- Administration EXEC
- Administration configuration
- Global configuration

Command History	Release	Modification
	Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.5.0	The backup and rebase keywords were added.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	Support for the oir keyword was removed.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** options to display a specified number of events. Use the **reverse** keyword to display the newest events at the top of the list.

After an upgrade to Cisco IOS XR Release 3.6, the **show configuration history** command in administration EXEC mode does not display any information from before the upgrade. To see information about commits prior to the upgrade, use the **show configuration commit list** command in administration EXEC mode.

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 2006
2      startup     configuration applied               Thu Jun 22 15:23:32 2006
3      OIR config  restore                             Thu Jun 22 15:23:25 2006
4      OIR config  restore                             Thu Jun 22 15:23:33 2006
5      OIR config  restore                             Thu Jun 22 15:23:33 2006
6      OIR config  restore                             Thu Jun 22 15:23:34 2006
7      OIR config  restore                             Thu Jun 22 15:23:34 2006
8      OIR config  restore                             Thu Jun 22 15:23:35 2006
9      OIR config  restore                             Thu Jun 22 15:23:36 2006
10     OIR config  restore                             Thu Jun 22 15:23:37 2006
11     OIR config  restore                             Thu Jun 22 15:23:37 2006
12     OIR config  restore                             Thu Jun 22 15:23:38 2006
13     OIR config  restore                             Thu Jun 22 15:23:38 2006
14     OIR config  restore                             Thu Jun 22 15:23:39 2006
15     OIR config  restore                             Thu Jun 22 15:23:39 2006
16     OIR config  restore                             Thu Jun 22 15:23:40 2006
17     OIR config  restore                             Thu Jun 22 15:23:40 2006
18     OIR config  restore                             Thu Jun 22 15:23:42 2006
19     OIR config  restore                             Thu Jun 22 15:23:42 2006
20     OIR config  restore                             Thu Jun 22 15:23:42 2006
21     OIR config  restore                             Thu Jun 22 15:23:43 2006
--More--

```

In the following example, the **show configuration history startup** 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 2006
2	startup	configuration applied	Sat Jul 1 15:02:24 2006
3	startup	configuration applied	Sat Jul 8 17:36:52 2006
4	startup	configuration applied	Sun Jul 9 13:40:27 2006
5	startup	configuration applied	Sat Jul 15 18:18:54 2006

In the following example, the **show configuration history commit** command is used with the **detail** keyword 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 2006
   Commit ID: 1000000001 Label:
   User: lab               Line: vty0
   Client: CLI             Comment:

2) Event: commit           Time: Thu Jun 22 16:58:18 2006
   Commit ID: 1000000002 Label:
   User: lab               Line: vty2
   Client: CLI             Comment:

3) Event: commit           Time: Thu Jun 22 16:58:39 2006
   Commit ID: 1000000003 Label:
   User: lab               Line: vty2
   Client: CLI             Comment:

4) Event: commit           Time: Sat Jul 1 15:29:31 2006
   Commit ID: 1000000001 Label:
   User: lab               Line: vty0
   Client: CLI             Comment:

5) Event: commit           Time: Sat Jul 1 15:32:25 2006
   Commit ID: 1000000002 Label:
   User: lab               Line: vty0
--More--
```

Table 21 describes the significant fields shown in the display.

Table 21 *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.

Table 21 *show configuration history Field Descriptions (continued)*

Field	Description
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 running	Displays the contents of the committed configuration.
show configuration running-config	Displays the contents of the committed configuration.
show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
show configuration commit list	Displays information about the configuration commits stored in the commit database.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.
show configuration failed startup	Displays information about a configuration that failed at startup.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
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 EXEC or administration EXEC mode.

show configuration inconsistency replica location *node-id*

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 rack/slot/module notation.

Defaults

Administration EXEC mode: Displays configuration inconsistencies for the admin plane configuration.
EXEC mode: Displays configuration inconsistencies for an SDR configuration.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

In administration EXEC mode, the replica node for the **show configuration inconsistency replica** command is the standby designated system controller (DSC). In EXEC mode, the replica nodes are the route processors (RPs) or distributed route processors (DRPs) that can become the designated secure domain router system controller (DSDRSC).

Use the **show configuration inconsistency replica** command, before performing a manual failover 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 replica node.

show configuration persistent

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

show configuration persistent [*diff*]

Syntax Description

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

Defaults

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

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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* argument if you want to check if there is a difference between the running configuration and the persistent configuration.

Task ID

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
```

■ show configuration persistent

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

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

Building configuration...
router vrrp
interface TenGigE0/1/0/1.1
vrrp 1 preempt delay 300
!
interface TenGigE0/1/0/1.2
vrrp 1 preempt delay 300
!
interface TenGigE0/1/0/1.3
vrrp 1 preempt delay 300
```

Related Commands

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

show configuration removed

To display a configuration removed during installation operations, use the **show configuration removed** command in EXEC or administration EXEC mode.

show configuration removed *config-id*

Syntax Description	<i>config-id</i>	Name of removed configuration. Type ? to see a list of the names of all removed configurations.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	This command was added to the administration EXEC mode.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	config-services	read

Examples	The following example shows a removed configuration: RP/0/RP0/CPU0:router# show configuration removed 20060301112919.cfg xml agent tty

```
show configuration removed
```

```
http server
end
```

Related Commands	Command	Description
	commit	Merges the target configuration to the running configuration.
	load	Populates the target configuration with the contents of a previously saved configuration file.
	show configuration (config)	Displays the contents of the target configuration.
	show configuration running	Displays the contents of the committed configuration.
	show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
	show configuration commit list	Displays information about the configuration commits stored in the commit database.
	show configuration history	Display history of configuration changes.
	show configuration failed (config)	Displays information about a configuration that failed during the last commit.
	show configuration failed startup	Displays information about a configuration that failed at startup.
	show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
	show configuration sessions	Displays the active configuration sessions.
	show running-config	Displays the current running (active) configuration.

show configuration rollback changes

To display changes that would be made by the **rollback configuration** command or to display the list of commit IDs, use the **show configuration rollback** command in EXEC, administration EXEC, administration configuration, or global configuration mode.

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

Syntax Description	<i>commit-id</i>	Name of configuration. When a specific <i>commit-id</i> is specified, only the changes that would occur if only the specified commit is rolled back are displayed.
	to <i>commit-id</i>	Displays the changes that will occur to the running configuration if the system is rolled back to the configuration specified with the <i>commit-id</i> argument.
	last <i>number-of-commits</i>	Displays the changes that will occur to the running configuration if the system is rolled back to the last number of commits specified with the <i>number-of-commits</i> argument.
	diff	(Optional) Displays added lines, changed lines, and deleted lines.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC Administration configuration Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command name was modified to include the configuration keyword. The show rollback points command was deprecated and replaced by the show configuration commit list command.
	Release 3.3.0	Support was added for the keyword diff .
	Release 3.4.0	No modification.
	Release 3.5.0	This command was added to administration EXEC mode.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

**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 *commit-id* argument without the **to** keyword to display the changes for a particular commit. This can be useful for troubleshooting actions of the **rollback configuration** command.

Examples

The following is sample output from the **show configuration rollback changes** command with the **to** keyword and the *commit-id* argument. The output displays the configuration changes that would occur if the configuration were to be rolled back to the configuration commit specified for the *commit-id* argument.

```
RP/0/RP0/CPU0:router# show configuration rollback changes to 1000000007

Building configuration...
hostname old-name
end
```

The following is sample output from the **show configuration rollback changes** command with **last** keyword and *number-of-commits* argument. The output displays the configuration changes that would occur if the configuration were to be rolled back to the number of configuration commits specified for the *number-of-commits* argument.

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

Building configuration...
hostname orig_name
interface POS0/1/0/1
 shutdown
!
end
```

The following is sample output from the **show configuration rollback changes** command with the **diff** keyword.

In the display, the following symbols signify changes:

- + indicates an added line.
- indicates a deleted line.
- # indicates a modified line.

```
router# show configuration rollback changes last 1 diff

Building configuration...
 interface Loopback1000
#  ipv4 address 1.1.1.1 255.255.255.255
!
end
```

Related Commands	Command	Description
	load rollback changes	Populates the target configuration with the contents of a previous configuration.
	rollback configuration	Rolls back the configuration to a previous commit.

show configuration running

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

show configuration running [*config-keyword*]

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

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>. Use the show configuration running command to display the currently active configuration.

Task ID	Task ID	Operations
	basic-services	read

Examples	The following example shows the currently running (committed) configuration: <pre>RP/0/0/CPU0:router(admin)# show configuration running</pre> <pre>Building configuration... username lab</pre>


```
secret 5 $1$XNWt$j8RscNdncKSRoMSnqSpbj/
group root-system
!
end
```

Related Commands	Command	Description
	commit	Merges the target configuration to the running configuration.
	load	Populates the target configuration with the contents of a previously saved configuration file.
	show configuration (config)	Displays the contents of the target configuration.
	show configuration running-config	Displays the contents of the committed configuration.
	show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
	show configuration commit list	Displays information about the configuration commits stored in the commit database.
	show configuration history	Display history of configuration changes.
	show configuration failed (config)	Displays information about a configuration that failed during the last commit
	show configuration failed startup	Displays information about a configuration that failed at startup.
	show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
	show configuration sessions	Displays the active configuration sessions.
	show running-config	Displays the current running (active) configuration.

show configuration running-config

To display the running configuration, use the **show configuration running-config** command in EXEC mode.

show configuration running-config [*config-keyword*]

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

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>. Use the <i>config-keyword</i> argument to display the running configuration for a specific keyword only.

Task ID	Task ID	Operations
	basic-services	read

Examples	The following example shows the currently running (committed) configuration: <pre>RP/0/0/CPU0:router# show configuration running-config</pre> Building configuration...

```

!! Last configuration change at 15:36:31 UTC Thu Nov 17 2005 by lab
   sessions  Users with active configuration sess
!n
hostname router
line consolestartup  Sh
  exec-timeout 0 0configuration
!
logging console debugging
|      Ou
snmp-server community public RW
<cr>
RP/0/0/
ipv4 source-routeadmin)#show confi
key chain IPSLA ?
  key 10
    key-string password 1
  ipv4 address 10.0.0.0 255.255.255.0
  encapsulation ppp
  keepalive disable
!
interface POS0/7/0/0
  shutdown
!
interface POS0/7/0/1
  shutdown
!
interface POS0/7/0/2
  shutdown
!
interface POS0/7/0/3
  shutdown
!
route ipv4 0.0.0.0/0 12.7.0.1
ipsla
  responder
!
!
end

```

Related Commands	Command	Description
	commit	Merges the target configuration to the running configuration.
	load	Populates the target configuration with the contents of a previously saved configuration file.
	show configuration (config)	Displays the contents of the target configuration.
	show configuration running	Displays the contents of the committed configuration.
	show configuration commit changes	Displays the changes made to the running configuration by previous configuration commits.
	show configuration commit list	Displays information about the configuration commits stored in the commit database.
	show configuration history	Display history of configuration changes.
	show configuration failed (config)	Displays information about a configuration that failed during the last commit.

■ show configuration running-config

Command	Description
show configuration failed startup	Displays information about a configuration that failed at startup.
show configuration rollback changes	Displays changes that would be made by the rollback configuration command or displays the list of commit IDs.
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 administration EXEC mode or in EXEC mode.

show configuration sessions [detail]

Syntax Description	detail	(Optional) Displays detailed information.

Defaults	No defaults behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	Support was added for the detail keyword.
	Release 3.4.0	No modification.
	Release 3.5.0	<i>Session</i> changed to <i>Current Configuration Session</i> in the display output.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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 is 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 22](#) describes the significant fields shown in the display.

Table 22 *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.

Related Commands

Command	Description
clear configuration sessions	Clears an active configuration session.

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 EXEC mode.

show default-afi-safi-vrf

Syntax Description This command has no arguments or keywords.

Defaults No defaults behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	Display of the default VPN routing and forwarding (VRF) instance was supported.
	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.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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](#)
- [set default-safi](#)
- [set default-vrf](#)

Task ID	Task ID	Operations
	basic-services	read

Examples

The following is 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 setting for the current session.
set default-safi	Sets the default SAFI setting for the current session.
set default-vrf	Sets the default VRF setting for the current session.

show history

To display a history of commands executed in EXEC, administration EXEC, administration configuration, or global configuration mode use the **show history** command in one of the supported modes.

show history [detail]

Syntax Description	detail	(Optional) Displays detailed history information.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC Administration configuration Global configuration

Command History	Release	Modification
	Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

The **show history** command displays a history of the command entered for the current command mode. For example, enter the **show history** command to display a history of commands entered in EXEC mode. Enter the **show history** command in global configuration mode to display a history of the commands entered in global configuration mode.

Task ID	Task ID	Operations
	config-services	read
	basic-services	read

Examples

In the following example, the **show history** command is run in EXEC mode to display a history of the command entered in EXEC mode:

```
RP/0/RP0/CPU0:router# show history
configure
admin
show history
```

In the following example, the **show history** command is run in global configuration mode to display a history of the command entered in global configuration mode:

```
RP/0/RP0/CPU0:router(config)# show history
interface pos 0/1/0/0
ipv4 address 10.0.0.0
root
end
describe line default autocommand config
line default autocommand configure
end
show history
```

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) Displays only a single command or a subset of commands available under a specified command mode.
sanitized	(Optional) Displays a sanitized configuration for safe distribution and analysis.

Defaults

The **show running-config** command without any arguments or keywords displays the entire contents of the running configuration file.

Command Modes

EXEC
Administration EXEC
Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

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

The following 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--
```

The following is sample output from the **show running-config** command that displays a subset of the running configuration. In the following 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
```

The following is sample output from the **show running-config sanitized** command that displays a sanitized version of the running configuration. The sanitized configuration can be used to share a configuration without exposing some configuration details.

```
RP/0/RP1/CPU0:router# show running-config sanitized
```

```
Building configuration...
```

```
!! Last configuration change at 05:26:50 UTC Thu Jan 19 2006 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.
show configuration running-config	Displays the contents of the running configuration.

show xml schema

To browse the XML schema and data, use the **show xml schema** command in EXEC mode.

show xml schema

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 The following 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
xml-schema[config]:> exit help

Related Commands	Command	Description
	copy xml-schema	Copies the XML schema files on the router as a tar ball file (.tar.gz).

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* [*param1* [...*param5*]]

no template *name*

Syntax Description

<i>name</i>	Unique name for the template to be created.
<i>param1</i> ... <i>param5</i>	Up to five template parameters.

Defaults

No templates are defined.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/RP1/CPU0:router(config-if-pre)# ipv4 address 10.3.32.154 255.0.0.0
RP/0/RP1/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** keyword and *name* argument.

The following is sample output from the **show running-config** command with the **template** keyword and *name* 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.



Distributed Route Processor Commands on Cisco IOS XR Software

Distributed route processors (DRPs) can be installed individually or in pairs. This module describes the commands used to create redundant DRP pairs.

DRP Overview

The DRP card and its associated physical layer interface module (PLIM) function as an additional route processor (RP) in the Cisco CRS-1 router. The DRP does not perform any of the control and management functions performed by the RP; therefore, it can never be the designated system controller (DSC) in a multishelf system. However, the DRP can be configured for the following purposes:

- The DRP can act as the designated secure domain router system controller (DSDRSC) in a secure domain router (SDR). An SDR is a part of the Cisco CRS-1 routing system that functions as a complete router, running its own routing protocols and forwarding IP packets between its interfaces.
- DRPs are not supported on the Cisco XR 12000 Series Router.
- SDRs were previously known as logical routers (LRs). The name was changed beginning with Cisco IOS XR Software Release 3.3.0.
- The DRP can provide additional processing capacity for any of the routing processes that run on the RP (for example, BGP, OSPF, IS-IS, MPLS, LDP, IP multicast, and so on).

Related Documents

For additional information, refer to the following Cisco Systems documents:

- *Configuring Secure Domain Routers on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*, for instructions on using DRPs in a secure domain router configuration.
- *Process Placement on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*, for instructions on configuring process placement and DRPs.
- *Cisco CRS-1 Carrier Routing System 16-Slot Line Card Chassis System Description*, for DRP hardware description and requirements.
- *Installing the Cisco CRS-1 Carrier Routing System 16-Slot Line Card Chassis*, for instructions on installing DRP and DRP PLIM cards.

location (drp)

To assign nodes to a DRP pair, use the **location** command in DRP pairing configuration mode. To remove the node from a DRP pair, use the **no** form of this command.

location *partially-qualified-nodeid* *partially-qualified-nodeid*

no location

Syntax Description

partially-qualified-nodeid Specifies the nodes to be assigned to the specified DRP pair.

The *node-id* argument is entered in the *rack/slot/** notation. Node IDs are always specified at the slot level, so the wildcard (*) is used to specify the CPU.

Defaults

No default behavior or values

Command Modes

DRP pairing configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **location** command in DRP pairing configuration mode to assign nodes to a DRP pair. The following rules apply to DRP pairing assignments:

- To create a DRP pair name, use the **pairing (drp)** command.
- Two nodes are assigned to each DRP pair. For example: **location 0/2/* 0/3/***.
- DRPs are always specified at a slot level. The wildcard (*) is used to specify the CPU.
- To be added to a DRP pair, the *node-id* must belong to the owner SDR. If a node is already assigned to a non-owner SDR, the node must be removed from the non-owner SDR before it can be assigned to a DRP pair.
- A *node-id* cannot be used by more than one DRP pair.

- Only two nodes can be assigned to a DRP pair. In the following example, only the last **location 0/0/*** takes effect:

```
(admin-config)# pairing pair1
(admin-config-pairing:pair1)# location 0/1/* 0/4/*
(admin-config-pairing:pair1)# location 0/0/* 0/4/*
(admin-config-pairing:pair1)# commit
```

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

Task ID	Task ID	Operations
	system	read, write

Examples

The following example shows how to enter DRP pairing configuration mode, create a DRP pair named “drp1”, and assign node 0/3/* and node 0/4/* to the DRP pair:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# pairing drp1
RP/0/RP0/CPU0:router(admin-config-pairing:drp1)# location 0/3/* 0/4/*
```

The following example shows how to remove a DRP pair:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# pairing drp1
RP/0/RP0/CPU0:router(admin-config-pairing:drp1)# no location
```

Related Commands	Command	Description
	location (SDR)	Adds or removes a node from an SDR configuration.
	pairing (drp)	Creates a DRP pair and enters DRP pairing configuration mode.
	pair (SDR)	Adds or removes a DRP pair from an SDR configuration.
	sdr	Creates or modifies an existing secure domain router.

pairing (drp)

To specify a distributed route processor (DRP) pair and enter DRP pairing configuration mode, use the **pairing** command in administration configuration mode. To remove a named DRP pair from the configuration, use the **no** form of this command.

pairing *pair-name*

no pairing *pair-name*

Syntax Description

<i>pair-name</i>	Name of the DRP pair. The name can a maximum of 32 alphanumeric characters. The characters “_” or “-” are also allowed. All other characters are invalid.

Defaults

No default behavior or values

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **pairing** *pair-name* command to create a DRP pair or modify an existing DRP pair.



Note

The *pair-name* argument creates a DRP pair if the *pair-name* specified does not already exist.

After the **pairing** *pair-name* command is issued, the router enters DRP pairing configuration mode. From DRP pairing configuration mode, you can specify the nodes for the DRP pair using the **location (drp)** command. The locations specified are added to the DRP pair, or modify the existing pair.

Use the **no** form of the command to remove a DRP pair configuration. When a DRP pair is removed from the configuration, the nodes are returned to the owner SDR.

Task ID	Task ID	Operations
	system	read, write

Examples

The following example shows how to enter DRP pairing configuration mode to configure a DRP pair:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# pairing drp1
RP/0/RP0/CPU0:router(admin-config-pairing:drp1)# location 0/3/* 0/4/*
```

The following example shows how to remove a DRP pair:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# no pairing drp1
```

Related Commands	Command	Description
	location (drp)	Adds or removes a node from a DRP pair.
	sdr	Creates or modifies an existing secure domain router.
	location (SDR)	Adds or removes a node from an SDR configuration.
	pair (SDR)	Adds or removes a DRP pair from an SDR configuration.



File System Commands on Cisco IOS XR Software

This chapter describes the Cisco IOS XR software commands used to manage file systems.



Caution

The commands in this chapter 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 chapter is not required and can result in router downtime, loss of service, and a corrupted database.

cd

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

Defaults

The default file directory is disk0:/usr.

Command Modes

EXEC

Command History

Releases	Modifications
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The present working directory is the directory used when EXEC commands that have an optional *filesystem* 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 the contents of a file system.
pwd	Displays the current working directory of the cd command.
show filesystem	Displays the layout and contents of a file system.

cfs check

To perform a check of the Configuration File System (CFS), use the **cfs check** command in EXEC or administration EXEC mode.

cfs check

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 designated secure domain router system controller (DSDRSC) 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]
```

clear-classic-config

To clear or truncate the Cisco IOS software running configuration stored in NVRAM, use the **clear-classic-config** command in EXEC mode.

clear-classic-config

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **clear-classic-config** command to clear space on the NVRAM, if the Cisco IOS software configuration is no longer needed or to boot the Cisco IOS software with no configuration.

Task ID	Task ID	Operations
	config-services	execute

Examples The following example shows how to clear the Cisco IOS software running configuration stored in NVRAM:

```
RP/0/0/CPU0:router# clear-classic-config
```

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 | location 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 (Cisco XR 12000 Series Router only). • compactflasha:—Copies from the compactflasha: file system partition (Cisco XR 12000 Series Router only). • 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[:password]@] location]/directory]/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@] location]/directory]/filename</i>. • running-config—Copies from the current system configuration. • tftp:—Copies from a TFTP network server. The syntax is tftp:<i>[[//location]/directory]/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/module</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

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Releases	Modifications
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. Support was added to copy to a designated node or to all nodes. Hardware partition support was added.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	Support was added to copy XML schema files.
Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: .
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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:

" () * , / : < > ? \ |

The maximum length allowed by the Cisco CRS-1 router for a filename is 254 characters including the path. If a filename longer than 254 characters is specified, the filename is truncated to 254 characters.

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 keywords **location all**.

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 23 describes the network protocols supported by Cisco IOS XR software.

Table 23 *Network Protocols Supported by Cisco IOS XR Software*

Prefix	Name	Description
tftp:	Trivial File Transfer Protocol	TFTP is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).
ftp:	File Transfer Protocol	FTP is an application protocol, part of the TCP/IP protocol stack, and is used for transferring files between network nodes. FTP requires a username and password.
rcp:	Remote Copy Protocol	The rcp protocol allows users to copy files to and from a file system residing on a remote host or server on the network. The rcp protocol uses TCP to ensure the reliable delivery of data. The rcp protocol downloads require a username.

Additional usage guidelines are in the following sections:

- [Invalid Combinations of Source and Destination, page 265](#)
- [Using TFTP, page 266](#)
- [Using FTP, page 266](#)
- [Using rcp, page 266](#)

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** | **location all**]

Example:

```
RP/0/RP0/CPU0:router# copy tftp://1.1.1.1/images/crs_software.pie disk1:
```



Note

Some Cisco IOS XR software 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** | **location all**]

Example:

```
RP/0/RP0/CPU0:router# copy ftp://john:secret@10.1.1.1/images/crs_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 Rtrl
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 Rtrl
```

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.

Table 24 shows the syntax and example for the **copy** command when used with FTP, rcp, and TFTP network servers.

Table 24 Syntax and Examples of the copy Command

Type	Syntax and Example
FTP	copy ftp://username:password@{hostname ipaddress}/directory-path/pie-name target-device [location node-id location all] Example: RP/0/RP0/CPU0:router# copy ftp://john:secret@10.1.1.1/images/comp-crs-full.pie disk1:
rcp	copy rcp://username@{hostname ipaddress}/directory-path/pie-name target-device [location node-id location all] Example: RP/0/RP0/CPU0:router# copy rcp://john@10.1.1.1/images/comp-crs-full.pie disk1:
TFTP	copy tftp://{hostname ipaddress}/directory-path/pie-name target-device [location node-id location all] Example: RP/0/RP0/CPU0:router# copy tftp://10.1.1.1/images/comp-crs-full.pie disk1:

Using xml-schema

Use the **xml-schema** keyword to obtain the most up-to-date XML schemas (.xsd files) from the router. This 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** option 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# copy ftp://john:secret@10.1.1.1/images/comp-crs-full.pie disk1:
```

Related Commands

Command	Description
cd	Changes the default directory or file system.
dir	Displays the contents of a file system.
show configuration failed (config)	Displays information about a configuration that failed during the last commit.

delete

To delete files, use the **delete** command in EXEC or administration EXEC mode.

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

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.
	filesystem:	(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.
	filename	Filename of the file to be deleted.
	location node-id	Deletes a file from a designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
	location all	Deletes a file from all nodes.

Defaults	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	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. Support was added to delete files from a node or from all nodes.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: .
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 default directory or file system.
dir	Displays the contents of a file system.
squeeze	Permanently deletes flash files by squeezing a flash file system.
undelete	Recovers a file marked “deleted” on a flash file system.

dir

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

dir [/all | /ena | /recurse] [*filesystem*:] [*filename*] {**location** *node-id* | **location** **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>	Displays a lists of files from a directory on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
location all	Displays a lists of files from a directory on all nodes.

Defaults

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

Command Modes

EXEC
Administration EXEC

Command History

Releases	Modifications
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. Support was added to display a list of files from a directory on a node or from all nodes.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: .
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 2003  boot_28_Aug_2003_11_21_49
5533      drwx  4096      Thu Aug 28 11:38:54 2003  boot_28_Aug_2003_11_38_54
5538      drwx  4096      Fri Sep  5 13:28:54 2003  boot_05_Sep_2003_13_28_54
5543      drwx  4096      Mon Sep  8 08:55:52 2003  boot_08_Sep_2003_06_59_08
--More--
```

Related Commands

Command	Description
cd	Changes the default directory or file system.
pwd	Displays the current working directory of the cd command.
show filesystem	Displays the layout and contents of a file system.

erase nvram:

To erase the NVRAM file system, use the **erase nvram:** command in EXEC mode.

erase nvram: [ena | format] [location node-id]

Syntax Description	ena	Erases the classic-rommon-vars file and the classic-config file in addition to the NVRAM file system. These files that are allocated in the NVRAM but are not part of the NVRAM file system.
	format	(Optional) Formats the entire NVRAM.
	location node-id	Erases the NVRAM on the specified node, such as the standby RP, from the active RP.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



Caution

Using the **erase nvram:** command permanently removes the files.

Task ID	Task ID	Operations
	filesystem	execute

 **erase nvram:**

Examples

The following example shows how to erase the NVRAM file system:

```
RP/0/RP0/CPU0:router# erase nvram:
```

```
Erase operation will destroy IOS/ENA files in "nvram":.. Continue? [confirm]y
```

Related Commands

Command	Description
delete	Deletes a file from a flash memory device.

erase nvram-raw:

To format the NVRAM raw data partition with a '0' value, use the **erase nvram-raw:** command in EXEC or administration EXEC mode.

erase nvram-raw: [**location** {*node-id* | **all**}]

Syntax Description	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/module</i> notation. Use the all keyword to indicate all nodes.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

The NVRAM is divided into two partitions. The first partition, consisting of 1 megabyte (MB), is used by the existing NVRAM file-system partition. The second partition, consisting of 1 MB, is a raw data partition and is used by the Kernel Dumper to store reboot historical logs, critical crash information, syslog, and Kernel Dumper traces. The **erase nvram-raw:** command formats the raw data partition of the NVRAM.

Task ID	Task ID	Operations
	filesystem	execute

Examples	The following example shows how to erase the raw data partition of the NVRAM file system:

```
RP/0/RP0/CPU0:router# erase nvram-raw:
```

 erase nvram-raw:**Related Commands**

Command	Description
delete	Deletes a file from a flash memory device.

format

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

format *filesystem:* [**partition**] [*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: , compactflash: , and compactflasha: .
partition		(Optional) Creates a partition on a hard disk. This option is not available when the bootflash: keyword is entered for the <i>filesystem:</i> argument.
<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.
location <i>node-id</i>		(Optional) Specifies the node where the file system is located. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
all		(Optional) Specifies all nodes where the file system is located.
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.
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.

Defaults	The default monlib file is the one included with the Cisco IOS XR software. <i>spare-number:</i> 0

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. Support was added to create a hard disk partition.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.

Release	Modification
Release 3.5.0	No modification.
Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: .
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Before you can use a new flash memory card, you must format it.



Caution

Formatting a storage device deletes all data on that device.



Note

The file systems that are available on the router and the formatting options available for file systems differ according to platform.

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.

As of Cisco IOS XR Release 3.6.0, 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.

If you partition disk0:, disk1: or the compactflash:, the size of the partitions are as indicated in [Table 25](#):

Table 25 **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%

The size of the three hard disk partitions are as follows:

- Primary partition (harddisk:)—30%
- Secondary partition (harddiska:)—60%
- Third partition (harddiskb:)—10%

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.

Related Commands

Command	Description
fsck	Checks a file system for a damage and repairs any problems.

fsck

To check a file system for damage, use the **fsck** command in EXEC or administration EXEC mode.

fsck *filesystem:* [**location** *node-id*]

Syntax Description

<i>filesystem:</i>	Name of the file system to check, followed by a colon. Possible values are disk0: , disk0a: , disk1: , disk1a: , harddisk: , harddiska: , harddiskb: , and compactflash: , compactflasha: .
location <i>node-id</i>	(Optional) Specifies the node where the file system is located. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. Support was added to check the hard-disk A file system for damage and repair any problems.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: . The command checks the file system, but does not repair the file system.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	filesystem	execute

Examples

The following example shows how to check the file system on flash disk0: for damage:

```
RP/0/RP0/CPU0:router# fsck disk0:
```

```
Phase 1 - Read and compare FATs
```

```
Phase 2 - Check cluster chains
```

```
Phase 3 - Check directories
```

```
Phase 4 - Check for lost files
```

```
157280 kb used, 843344 kb free, 2541 files, 190 directories
```

```
Filesystem is clean.
```

Related Commands

Command	Description
show filesystem	Displays the layout and contents of a file system.

mkdir

To create a new directory on a file system, use the **mkdir** command in EXEC or administration EXEC mode.

mkdir *filesystem:* [**location** *node-id* | **location** **all**]

Syntax Description

filesystem:	File system on which to create a new directory.
location <i>node-id</i>	(Optional) Creates a new directory on a file system on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
location all	(Optional) Creates a new directory on a file system on all RP and DRP nodes.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Releases	Modifications
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. Support was added to create a new directory on a file system on a designated node or on all nodes.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: .
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 2004  newdir
37146      drwx  4096      Sun Dec 14 15:30:48 2003  malloc_dump
43030      drwx  4096      Wed Dec 24 11:20:52 2003  tracebacks
43035      drwx  4096      Thu Jan  8 18:59:18 2004  sau
51026      drwx  4096      Sat Dec 27 02:52:46 2003  tempA
51027      drwx  4096      Sat Dec 27 02:04:10 2003  dir.not.del
-430307552 -rwx   342      Fri Jan 16 10:47:38 2004  running-config
-430305504 -rwx  39790      Mon Jan 26 23:45:56 2004  cf.dat
```

```
39929724928 bytes total (39883231232 bytes free)
```

Related Commands	Command	Description
	dir	Displays the contents of a file system.
	rmdir	Removes an existing directory in a flash file system.

pwd

To display the present working directory, use the **pwd** command in EXEC mode.

pwd

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Releases	Modifications
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 default directory or file system.
dir	Displays the contents of a file system.

rmdir

To remove an existing directory, use the **rmdir** command in EXEC or administration EXEC 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>	Removes a directory from the designated node.
location all	Removes a directory from all nodes.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Releases	Modifications
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. Support was added to remove a directory from a node or from all nodes.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: .
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 2003  malloc_dump
43030      drwx  4096      Wed Dec 24 11:20:52 2003  tracebacks
43035      drwx  4096      Thu Jan  8 18:59:18 2004  sau
51026      drwx  4096      Sat Dec 27 02:52:46 2003  tempA
51027      drwx  4096      Sat Dec 27 02:04:10 2003  dir.not.del
-430307552 -rwx   342      Fri Jan 16 10:47:38 2004  running-config
-430305504 -rwx  39790      Mon Jan 26 23:45:56 2004  cf.dat
```

```
39929724928 bytes total (39883235328 bytes free)
```

Related Commands

Command	Description
delete	Deletes a file from a flash memory device.
dir	Displays the contents of a file system.
mkdir	Creates a new directory on a flash file system.

show filesystem

To display the layout and contents of file systems, use the **show filesystem** command in EXEC or administration EXEC mode.

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: , compactflash: .
firmware	(Optional) Displays the firmware level.
stats	(Optional) Displays device statistics.
verbose <i>level</i>	(Optional) Changes the device driver verbose level.
location <i>node-id</i>	(Optional) Displays the layout and contents of file systems on the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
location all	(Optional) Displays the layout and contents of file systems on all nodes.

Defaults

The file system for the active RP is displayed.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. Support was added to display the layout and contents of file systems on all nodes.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	The following file systems were added: disk0a: , disk1a: , and compactflasha: .
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 is 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 is sample output from the **show filesystem** command using the optional **location** keyword and **node-id** 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 26 describes the significant fields shown in the display.

Table 26 *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 EXEC or administration EXEC mode.

show media [*location node-id* | *all*]

Syntax Description

location <i>node-id</i>	(Optional) Displays the disk storage media on the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
location <i>all</i>	(Optional) Displays the disk storage media on all nodes.

Defaults

The disk storage media for the active RP is displayed.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

Task ID

Task ID	Operations
filesystem	read

Examples

The following sample output disk displays the disk storage media for the active RP:

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

```
Media Information for 0/RP0/CPU0.
```

Mountpoint	FsType	State	DrvrPid	Mirror	Flags
=====					
/disk0:	FAT16	Mounted	0024598	Enabled	
/disk0a:	FAT16	Not Present			
/disk1:	FAT16	Mounted	0024599		

```

/disk1a:      FAT16  Not Present
/harddisk:    FAT32  Mounted          0143421
/harddiska:   FAT32  Not Present
/harddiskb:   FAT32  Not Present

```

The following sample output displays the disk storage media on all nodes:

RP/0/RP0/CPU0:router# **show media location all**

Media Information for 0/4/CPU0.

Mountpoint	FsType	State	DrvrPid	Mirror	Flags
/disk0:	FAT16	Mounted	0024598	Enabled	
/disk0a:	FAT16	Not Present			
/disk1:	FAT16	Not Present			
/disk1a:	FAT16	Not Present			
/harddisk:	FAT32	Mounted	0061493		
/harddiska:	FAT32	Not Present			
/harddiskb:	FAT32	Not Present			

Media Information for 0/4/CPU1.

Mountpoint	FsType	State	DrvrPid	Mirror	Flags
/disk0:	FAT16	Mounted	0024598	Enabled	
/disk0a:	FAT16	Not Present			
/disk1:	FAT16	Not Present			
/disk1a:	FAT16	Not Present			
/harddisk:	FAT32	Mounted	0036919		
/harddiska:	FAT32	Not Present			
/harddiskb:	FAT32	Not Present			

Media Information for 0/RP0/CPU0.

Mountpoint	FsType	State	DrvrPid	Mirror	Flags
/disk0:	FAT16	Mounted	0024598	Enabled	
/disk0a:	FAT16	Not Present			
/disk1:	FAT16	Mounted	0024599		
/disk1a:	FAT16	Not Present			
/harddisk:	FAT32	Mounted	0143421		
/harddiska:	FAT32	Not Present			
/harddiskb:	FAT32	Not Present			

Media Information for 0/RP1/CPU0.

Mountpoint	FsType	State	DrvrPid	Mirror	Flags
/disk0:	FAT16	Mounted	0024598	Enabled	
/disk0a:	FAT16	Not Present			
/disk1:	FAT16	Mounted	0024599		
/disk1a:	FAT16	Not Present			
/harddisk:	FAT32	Mounted	0131133		
/harddiska:	FAT32	Not Present			
/harddiskb:	FAT32	Not Present			

Table 27 describes the significant fields shown in the display.

Table 27 *show media Field Descriptions*

Field	Description
Mountpoint	File system name.
FsType	File system type.
State	State of the storage media.

Table 27 *show media Field Descriptions (continued)*

Field	Description
DrvrPid	Process ID of the media driver.
Mirror	Indicates if disk mirroring is enabled or not.
Flags	Where disk mirroring is enabled, indicates whether the partition has been repaired, formatted, or the driver has been restarted.

Related Commands

Command	Description
mirror	Configures disk mirroring on a node.
mirror pause	Temporarily pauses disk mirroring on a node.

squeeze

To permanently erase files tagged as “deleted” or “error” on a flash file system, use the **squeeze** command in EXEC mode.

squeeze *filesystem:*

Syntax Description	<i>filesystem:</i> Name of the file system, followed by a colon.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

When flash memory is full, you might need to rearrange the files so that the space used by the files marked “deleted” can be reclaimed. (This “squeeze” process is required for linear flash memory cards to make sectors contiguous; the free memory must be in a “block” to be usable.)

When you enter the **squeeze** command, the router copies all valid files to the beginning of flash memory and erases all files marked “deleted.” After the squeeze process is completed, you can write to the reclaimed flash memory space.



Caution

After performing the squeeze process you cannot recover deleted files using the **undelete** command.

In addition to removing deleted files, the **squeeze** command removes any files that the system has marked as “error.” An error file is created when a file write fails (for example, the device is full). To remove error files, you must use the **squeeze** command.

Rewriting flash memory space during the squeeze operation may take several minutes.

Task ID	Task ID	Operations
	basic-services	execute

Examples

The following example shows how to permanently erase files tagged as “deleted” or “error” on the bootflash file system:

```
RP/0/0/CPU0:router# squeeze bootflash:
```

```
All deleted files will be removed. Continue? [confirm] y  
Squeeze operation may take a while. Continue? [confirm] y
```

```
Squeeze under progress 30  
Squeeze of bootflash: complete
```

Related Commands	Command	Description
	delete	Deletes a file from a flash memory device.
	dir	Displays the contents of a file system.
	undelete	Recovers a file marked “deleted” on a flash file system.

undelete

To recover a file marked “deleted” on a flash file system, use the **undelete** command in EXEC mode.

undelete *index filesystem:*

Syntax Description	<i>index</i>	Number that indexes the file in the dir command output.
	<i>filesystem:</i>	File system containing the file to undelete, followed by a colon.

Defaults	The default file system is the one specified by the cd command.

Command Modes	EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

For flash file systems, when you delete a file, Cisco IOS XR software simply marks the file as deleted, but it does not erase the file. The **undelete** command allows you to recover a deleted file on a specified flash memory device. You must undelete a file by its index, because you could have multiple deleted files with the same name. For example, the “deleted” list could contain multiple configuration files with the name router-config. You undelete by index to indicate which of the many router-config files from the list to undelete. Use the **dir** command to learn the index number of the file you want to undelete.

You cannot undelete a file if a valid (undeleted) file with the same name exists. Instead, you first delete the existing file and then undelete the file you want. For example, if you had an undeleted version of the router-config file and you wanted to use a previous, deleted version instead, you could not simply undelete the previous version by index. You would first delete the existing router-config file and then undelete the previous router-config file by index. You can delete and undelete a file up to 15 times.

undelete

On flash file systems, if you try to recover the configuration file pointed to by the CONFIG_FILE environment variable, the system prompts you to confirm recovery of the file. This prompt reminds you that the CONFIG_FILE environment variable points to an undeleted file. To permanently delete all files marked “deleted” on a flash memory device, use the **squeeze** command.

Task ID	Task ID	Operations
	filesystem	execute

Examples

The following example recovers the deleted file whose index number is 1 on the bootflash file system:

```
RP/0/0/CPU0:router# undelete 1 bootflash:
```

Related Commands

Command	Description
cd	Changes the default directory or file system.
delete	Deletes a file from a flash memory device.
dir	Displays the contents of a file system.
pwd	Displays the current working directory of the cd command.
squeeze	Permanently deletes flash files by squeezing a flash file system.

unmount

To render a media device safe to be removed, use the **unmount** command in EXEC or administration EXEC mode.

unmount *filesystem:* [**location** *node-id*] [**undo**]

Syntax Description	<i>filesystem:</i>	File system to unmount, followed by a colon. Possible values are disk0: , disk1: , harddisk: , and compactflash: .
	location <i>node-id</i>	(Optional) Specifies a node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
	undo	Remounts the device if it is not removed and reinserted.

Defaults No default behavior or values

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **unmount** command before removing the media device. The command unmounts all partitions and ensures that no further access is made to the device. Use the **undo** option to remount the device if it is not removed and reinserted.

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

Examples The following example unmounts the disk0: file system so that it can be safely removed:

```
RP/0/0/CPU0:router# unmount disk0:
```

Related Commands	Command	Description
	cd	Changes the default directory or file system.
	delete	Deletes a file from a flash memory device.
	dir	Displays the contents of a file system.
	pwd	Displays the current setting of the cd command.
	squeeze	Permanently deletes flash files by squeezing a flash file system.



Hardware Redundancy and Node Administration Commands on Cisco IOS XR Software

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.

ce tftp server

To enable Trivial File Transfer Protocol (TFTP) on a specific directory, or to enable files to be written to the TFTP server, use the **ce tftp server** command in administration configuration mode.

ce tftp server {**homedir** *name* | **write**}

Syntax Description

homedir <i>name</i>	Specifies the home directory for TFTP server.
write	Enables files to be written to the TFTP server.

Defaults

No default behavior or values

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.0	This command was introduced on the Cisco CRS-1.
Release 3.2	No modification.
Release 3.3.0	The ce tftp server enable EXEC mode command was replaced by the ce tftp server command in administration configuration mode.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
root-system	read, write

Examples

The following example shows how to enable files to be written to the TFTP server:

```
RP/0/RP0/CPU0:router(config)# ce tftp server write
```

The following example shows how to enable TFTP on a specific directory. In this example, the directory is called “dir”:

```
RP/0/RP0/CPU0:router(config)# ce tftp server homedir dir
```

clear mbus-statistics location

To clear Mbus firmware statistics on a specific node, use the **clear mbus-statistics location** command in administration EXEC mode.

clear mbus-statistics location {*node-id* | **all**}

Syntax Description

<i>node-id</i>	Identifies the location of the node whose Mbus interface counters you want to clear. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
Note	Enter the show platform command to see the location of all nodes installed in the router.
all	Clears Mbus interface counters for all nodes installed in the router.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
sysmgr	execute

Examples

The following example shows how to clear all Mbus interface counters on a specific node:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# clear mbus-statistics location 0/0/CPU0
```

dsc serial

To define serial ID for a rack, use the **dsc serial** command in administration configuration mode. To remove a serial ID entry from the designated shelf controller (DSC) table, use the **no** form of this command.

dsc serial *serial_Id* **rack** *rack_num*

no dsc serial *serial_Id* **rack** *rack_num*

Syntax Description

<i>serial_Id</i>	Defines a serial ID for a rack. The serial ID is included as an entry in the DSC table. Range is from 0 through 16 characters.
rack <i>rack_num</i>	Identifies the rack whose ID you are configuring to be the serial ID.
Note	For systems that include two line card chassis and one fabric chassis, the line card chassis IDs are 0 and 1, and the fabric chassis ID is F0.

Defaults

No default behavior or values

Command Modes

Administration configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	The task ID was updated to system.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

For more information about identifying and selecting a DSC on a Cisco CRS-1 router, Cisco XR 12000 Series Router, or Cisco CRS-1 Multishelf System, refer to *Cisco IOS XR Getting Started Guide*.

**Note**

The serial ID is the hardware serial number that identifies the chassis.

Use the **show running-config** command to display and verify the defined serial ID for a rack.

Task ID

Task ID	Operations
system	read, write

Examples

The following example shows how to define the serial ID for a rack:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# dsc serial TBC0610991700000 rack 1
```

Related Commands

Command	Description
show dsc	Displays the current DSC configuration for the shelf or for the system.
show running-config	Displays the current running (active) configuration.

env disable

To disable environment monitoring on the chassis, use the **env disable** command in administration configuration mode. To reenable environment monitoring after it has been disabled, use the **no** form of this command.

env disable

no env disable

Syntax Description This command has no arguments or keywords.

Defaults Environment monitoring is enabled.

Command Modes Administration configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	This command was first supported on the Cisco XR 12000 Series Router. The env disable command was moved from the root-system task ID to the system task ID.
	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.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

By default, environment monitoring related to temperature and voltage is enabled on a router running Cisco IOS XR software. If environmental monitoring is disabled, you are not alerted if the router overheats.

Task ID	Task ID	Operations
	system	read, write

Examples

The following example shows how to disable environment monitoring with the **env disable** command:

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

Related Commands

Command	Description
env power-supply disable	Enables power supply monitoring on the chassis.

env power-supply disable

To disable power supply monitoring on the chassis, use the **env power-supply disable** command in administration configuration mode. To disable power supply monitoring, use the **no** form of this command.

env power-supply disable

no env power-supply disable

Syntax Description

This command has no arguments or keywords.

Defaults

Power supply monitoring is enabled.

Command Modes

Administration configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	The env power-supply command was moved from the root-system task ID to the system task ID. The threshold {restart voltage shutdown voltage} keywords and arguments were added to the env power-supply command.
Release 3.4.0	No modification.
Release 3.4.1	The threshold {restart voltage shutdown voltage} keywords and arguments were removed, and the command was changed to env power-supply disable . Power supply monitoring was enabled by default.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

env power-supply disable

Task ID	Task ID	Operations
	system	read, write

Examples

The following example shows how to disable power supply monitoring with the **env power-supply disable** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# env power-supply disable
```

Related Commands	Command	Description
	env disable	Disables environment monitoring on the chassis.

facility-alarm contacts

To set or unset facilities for processing alarms related to temperature and power supply conditions, use the **facility-alarm contacts** command in administration EXEC mode.

facility-alarm contacts {all | critical | major | minor} {audio | both | visual} {on | off}

Syntax Description		
	all	Sets the facility alarm contacts so that an audio and visual alarm alerts the user to a facility alarm of any severity.
	critical	Sets the facility alarm contacts so that an audio and visual alarm alerts the user to critical facility alarms.
	major	Sets the facility alarm contacts so that an audio and visual alarm alerts the user to major facility alarms.
	minor	Sets the facility alarm contacts so that an audio and visual alarm alerts the user to minor facility alarms.
	audio	Sets the facility alarm contacts so that an audio alarm alerts the user to alarms of the specified severity.
	both	Sets the facility alarm contacts so that an audio and visual alarm alerts the user to alarms of the specified severity.
	visual	Sets the facility alarm contacts so that a visual alarm alerts the user to alarms of the specified severity.
	on	Enables facility alarm contacts configuration.
	off	Disables facility alarm contacts configuration.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
root-system	read

Examples

The following example shows how to enable an audio alarm to alert the user when a critical facility-alarm occurs:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# facility-alarm contacts critical audio on
```

Related Commands

Command	Description
show fpd package	Displays audio and visual facility alarm information for the router.

hw-module boot override

To place the standby RP into ROM Monitor mode so that you can update the ROMMON software in a single chassis system to a compatible ROM Monitor version, use the **hw-module boot override** command in administration configuration mode. To remove an RP from ROM Monitor mode, use the **no** form of this command.

hw-module boot override

no hw-module boot override

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Administration configuration

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1.
	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.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Before you can upgrade a single-chassis system to Cisco IOS XR Software Release 3.3.0 or later release, you need to first upgrade the ROM Monitor software to a compatible version. If you do not perform this upgrade in a single-chassis system, the standby RP fails to boot and an error message appears. To avoid boot failure, you need to use the **hw-module boot override** command to place the standby RP into ROM Monitor mode, and update the ROMMON software as required.

For ROM Monitor requirements for Cisco IOS XR Software Release 3.01 and later releases, refer to Software/Firmware Compatibility Matrix at the following URL:

http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html

Use the **show platform** command to view a summary of the nodes in the router, including status information.

hw-module boot override

Task ID	Task ID	Operations
	root-system	read, write
	root-lr	read, write

Examples

The following example shows how to boot the standby RP to upgrade its ROMMON software to a more recent ROM Monitor version:

```
RP/0/RP0/CPU0:router# admin  
RP/0/RP0/CPU0:router(admin)# configure  
RP/0/RP0/CPU0:router(admin-config)# hw-module boot override
```

Related Commands	Command	Description
	show platform	Displays information and status for each node in the system.

hw-module location (Cisco XR 12000 Series Router)

To configure various hardware attributes for a specific node, or for all nodes installed in the router, use the **hw-module location** command. The syntax and tasks performed by the **hw-module location** command differ, depending on the command mode you are running when you enter the **hw-module location** command.

To reset a specific node or all nodes on the router, or to put a node into maintenance mode, use the **hw-module location** command in EXEC mode as follows:

```
hw-module location {node-id {maintenance-mode | reload [path | warm]}} | all reload [path]
```

To reset a specific node or all nodes, use the **hw-module location** command in administration EXEC mode as follows:

```
hw-module location {node-id | all} reload [path | warm]
```

To disable the power, monitor, or shutdown states of the hardware on a specific node, or on all nodes installed in the router, use the **hw-module location** command in administration configuration mode, as follows:

```
hw-module location {node-id | all} {power disable | reset auto disable | shutdown}
```

Syntax Description

<i>node-id</i>	Node whose hardware attributes you want to configure. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation. Note Enter the show platform command to see the location of all nodes installed in the router.
all	Indicates that you want to configure the hardware attributes for all nodes installed in the router.
reload	Resets power-cycle, reloads hardware, or both on a specific node.
<i>path</i>	Specifies a specific image you want to download onto the specific node or nodes. Replace <i>path</i> with the TFTP or disk path to the image you want to download.
warm	Specifies a warm reload of the node.
maintenance-mode	Brings the node down and puts the node into maintenance mode.
power disable	Disables the power state on the specified node.
reset auto disable	Disables the automonitor state on the specified node or nodes.
shutdown	Disables the shutdown state on the specified node.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC
Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	The maintenance-mode keyword was added in EXEC mode.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

**Note**

By default, the node remains powered until you specify that you want it powered down with the **hw-module location node-id power disable** command.

Task ID

Task ID	Operations
root-lr	read (in EXEC mode, administration EXEC mode, and administration configuration mode) write (in administration configuration mode)
sysmgr	execute (in EXEC mode and administration EXEC mode) read (in administration configuration mode) write (in administration configuration mode)

Examples

The following example shows how to reset the hardware on all nodes in the router:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# hw-module location all reload
```

```
WARNING: This will take the requested node out of service.
Do you wish to continue?[confirm(y/n)]
```

The following example shows how to disable the auto monitor state on all nodes installed in the router:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# hw-module location all reset auto disable
```

hw-module location (Cisco CRS-1)

To configure various hardware attributes for a specific node, or for all nodes installed in the router, use the **hw-module location** command. The syntax and tasks performed by the **hw-module location** command differ, depending on the command mode you are running when you enter the **hw-module location** command.

To reset a specific node, or to put a node into maintenance mode, use the **hw-module location** command in EXEC mode as follows:

```
hw-module location node-id {maintenance-mode | reload {path | warm | suppress {on | off}}}
```

To reset a specific node or all nodes, use the **hw-module location** command in administration EXEC mode as follows:

```
hw-module location node-id reload {path | warm}
```

Syntax Description		
	<i>node-id</i>	Node whose hardware attributes you want to configure. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
		Note Enter the show platform command to see the location of all nodes installed in the router.
	maintenance-mode	Brings the node down and puts the node into maintenance mode.
	reload	Resets power-cycle, reloads hardware, or both on a specific node.
	<i>path</i>	Specifies a specific image you want to download onto the specific node or nodes. Replace <i>path</i> with the TFTP or disk path to the image you want to download.
	warm	Specifies a warm reload of the node.
	suppress on off	Disables or reenables a warm reload of the node.

Defaults No default behavior or values

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1.
	Release 3.4.0	The maintenance-mode keyword was added in EXEC mode.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

**Note**

By default, the node remains powered until you specify that you want it powered down with the **hw-module location node-id power disable** command.

**Note**

Before reloading nodes on a Cisco CRS-1 router, we recommend using the **cfs check** command to check the sanity of the configuration file system and attempt to recover from internal inconsistencies. You need to enter the **cfs check** command on each secure domain router (SDR) that has nodes impacted by the reload.

Task ID

Task ID	Operations
root-lr	execute (in EXEC mode)
sysmgr	execute (in EXEC mode and administration EXEC mode)

Examples

The following example shows how to reset the hardware on a specific node from EXEC mode:

```
RP/0/RP0/CPU0:router # hw-module location 0/1/CPU0 reload
```

The following example shows how to reset the hardware on a specific node from Administration EXEC mode:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# hw-module location 0/3/CPU0 reload
```

hw-module port

To enable a SONET/SDH port to be used for Spatial Reuse Protocol (SRP), use the **hw-module port** command in global configuration mode. To disable SRP and enable the port for Packet-over-SONET/SDH (POS), use the **no** form of this command.

hw-module port *port-id* **srp** **location** [**preconfigure**] *node-id*

no hw-module port *port-id* **srp** **location** [**preconfigure**] *node-id*

Syntax Description

<i>port-id</i>	Number that identifies the physical port on a line card. - For the OC-192 physical layer interface module (PLIM), the range is from 0 through 3. - For the OC-48 PLIM, the range is from 0 through 15.
srp	Sets the port in Spatial Reuse Protocol (SRP) mode
location	Indicates a specific node location.
preconfigure	(Optional) Specifies the preconfigure option. Note Use the preconfigure option only if a node has not yet been inserted into the specified location.
<i>node-id</i>	Identifies the location of the node on which you want to enable an SRP port, in the <i>rack/slot/module</i> notation.

Defaults

SRP is disabled on all SONET/SDH ports.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
Release 3.4.0	The hw-module port command was supported on the OC-48 PLIM.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

hw-module port

Use the [show platform](#) command to view a summary of the nodes in the router, including status information.

Task ID	Task ID	Operations
	root-lr	read, write

Examples

The following example shows how to enable a SONET/SDH port to be used for SRP:

```
RP/0/RP0/CPU0:router# configure  
RP/0/RP0/CPU0:router(config)# hw-module port 1 srp location 0/1/CPU0
```

Related Commands	Command	Description
	show platform	Displays information and status for each node in the system.

hw-module power

To power on a specified line card or disable the node power-on feature, use the **hw-module power** command in administration configuration mode. To power off a line card, use the **no** form of this command.

hw-module power [**disable**] **location** *node-id*

no hw-module power [**disable**] **location** *node-id*

Syntax Description	disable	(Optional) Disables the power state
	location <i>node-id</i>	Identifies the node you want to power on, or whose node power-on feature you want to disable. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults	Power is on for all nodes.

Command Modes	Administration configuration

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

The **hw-module power** command is available for line cards only; it is not available for router processor (RP) cards.

Use the [show platform](#) command to view a summary of the nodes in the router, including status information.

Task ID	Task ID	Operations
	root-system	read, write
	root-lr	read, write

Examples

The following example shows how to power on a line card:

```
RP/0/RP0/CPU0:router # admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# hw-module power location 0/1/0
```

The following example shows how to disable the power-on feature for a line card:

```
RP/0/RP0/CPU0:router # admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# hw-module power disable location 0/SM3/SP
```

Related Commands

Command	Description
show platform	Displays information and status for each node in the system.

hw-module power disable

To disable the node power-on feature on a specific line card, use the **hw-module power disable** command in administration configuration mode. To reenable the node power-on feature on a line card, use the **no** form of this command.

hw-module power disable location *node-id*

no hw-module disable location *node-id*

Syntax Description

location <i>node-id</i>	Identifies the node whose power-on feature you want to disable. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults

Power is on for all nodes.

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the [show platform](#) command to view a summary of the nodes in the router, including status information.

The **hw-module power disable** command is available for line cards only; it is not available for RP cards.

Task ID

Task ID	Operations
sysmgr	read, write
root-lr	read, write

Examples

The following example shows how to disable the node power-on feature on a line card:

```
RP/0/0/CPU0:router # admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# hw-module power disable location 0/0/CPU0
```

Related Commands

Command	Description
show platform	Displays information and status for each node in the system.

hw-module reset auto

To reset a specific node, use the **hw-module reset auto** command in administration configuration mode. To disable the reset feature on a specific node, use the **no** form of this command.

hw-module reset auto [**disable**] **location** *node-id*

no hw-module reset auto [**disable**] **location** *node-id*

Syntax Description

disable	(Optional) Disables the node reset feature on the specified node.
location <i>node-id</i>	Identifies the node you want to reload. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

The node reset feature is enabled for all nodes.

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **hw-module reset auto** command is used to reload Cisco IOS XR software on a specific node. The node reloads with the current running configuration and active software set for that node.

Task ID

Task ID	Operations
root-system	read, write
root-lr	read, write

Examples

The following example shows how to reload a node:

```
RP/0/RP0/CPU0:router # admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# hw-module reset auto location 0/2/CPU0

RP/0/RP0/CPU0:router# RP/0/RP0/CPU0:Apr  2 22:04:43.659 : shelfmgr[294]: %S
HELFMGR-3-USER_RESET : Node 0/2/CPU0 is reset due to user reload request
```

Related Commands

Command	Description
hw-module power	Powers on a specified node. (Cisco CRS-1 router only)
hw-module shutdown	Administratively shuts down a specified node.

hw-module reset auto disable

To disable the node reset feature on a specific node, use the **hw-module reset auto disable** command in administration configuration mode. To reenable the reset feature on a specific node, use the **no** form of this command.

hw-module reset auto disable location *node-id*

no hw-module reset auto disable location *node-id*

Syntax Description

disable	(Optional) Disables the node reset feature on the specified node.
location <i>node-id</i>	Identifies the node you want to reload. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

The node reset feature is enabled for all nodes.

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
sysmgr	read, write
root-lr	read, write

Examples

The following example shows how to disable the reload feature on a node:

```
RP/0/0/CPU0:router # admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# hw-module reset auto disable location 0/0/CPU0
```

Related Commands

Command	Description
hw-module power	Powers on a specified node. (Cisco CRS-1 router only)
hw-module shutdown	Administratively shuts down a specified node.

hw-module service firewall location

To configure the firewall role as the role for a node, use the **hw-module service firewall location** command in global configuration mode. To remove the firewall role from a node, use the **no** form of this command.

hw-module service firewall location *node-id*

no hw-module service firewall location *node-id*

Syntax Description

<i>node-id</i>	Location in which you want the firewall role configured. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **hw-module service firewall** command to configure the firewall role as the role for a node. The firewall role supports the firewall and VRF-Aware Service Infrastructure (VASI) services. A firewall or VASI interface service instance is activated on a service card only if the firewall role is configured as the role for the service card's location. A service card can be configured with only one role at a time. If you change the role of a service card, the card reboots in a mode that enables it to run the different services supported by the new role.

Use the **service-location** command to associate a service instance with a service card.

Use the **show services role** command to display the roles configured on service card locations.

The MSB is automatically reset to 1 whenever the firewall service role is reloaded.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to configure the firewall service role on the MSB:

```
RP/0/0/CPU0:router(config)# hw-module service firewall location 0/3/CPU0
```

Related Commands

Command	Description
firewall	Configures a virtual firewall in Cisco IOS XR software.
interface vasi	Configures a VASI interface and enters interface configuration mode.
service-location (firewall, VASI)	Associates a physical interface with a firewall or VASI interface service instance,
show services role	Displays the configured roles of the service cards.

hw-module service maintenance-mode location

To configure the router to take a specific node into maintenance mode in the event of disaster recovery, use the **hw-module service maintenance-mode location** command in global configuration mode. To reset this configuration, use the **no** form of the command.

hw-module service maintenance-mode location *node-id*

no hw-module service maintenance-mode location *node-id*

Syntax Description

<i>node-id</i>	Location of the service card that you want to move into offline mode. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

In case of disaster recovery, the router reloads a failed line card if MDR is unsuccessful, and does not put the line card in maintenance mode.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

In the event that a line card fails, the router attempts to restart all the processes on the line card without disrupting the traffic flow. This is called a Minimum Disruptive Restart (MDR). If the MDR does not recover the line card, the router reloads the line card. You can configure the router to place the line card into maintenance mode after an unsuccessful MDR, instead of reloading it. Use the **hw-module service maintenance-mode location** command to configure the router to take a specified line card into maintenance mode after an unsuccessful MDR, instead of reloading the line card.

Maintenance mode is a mode in which only the processes that are required for collecting useful data for debugging run.

hw-module service maintenance-mode location

Task ID	Task ID	Operations
	root-lr	read, write

Examples

The following example shows how to move the card at 0/1/CPU0 into maintenance mode:

```
RP/0/0/CPU0:router# configure  
RP/0/0/CPU0:router(config)# hw-module service maintenance-mode location 0/1/CPU0
```

Related Commands

Command	Description
hw-module location (Cisco CRS-1)	Configures various hardware attributes for nodes.
hw-module location (Cisco XR 12000 Series Router)	Configures various hardware attributes for nodes.
show services role	Displays the configured roles of the service cards.

hw-module service offline location

To configure offline mode as the role for a specific node, use the **hw-module service offline** command in global configuration mode. To disable offline mode, use the **no** form of the command.

hw-module service offline location *node-id*

no hw-module service offline location *node-id*

Syntax Description

<i>node-id</i>	Location of the service card that you want to move into offline mode. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Offline mode disables all configured service instances on a service card. If there is a service active on the service card, the service switches over to a standby location if a standby is configured.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to move the card at 0/1/CPU0 into offline mode:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# hw-module service offline location 0/1/CPU0
```

 hw-module service offline location

Related Commands	Command	Description
	show services role	Displays the configured roles of the service cards.

hw-module shutdown

To administratively shut down a specific node, use the **hw-module shutdown** command in administration configuration mode. To return a node to the up state, use the **no** form of this command.

hw-module shutdown location *node-id*

no hw-module shutdown location *node-id*

Syntax Description

location <i>node-id</i>	Identifies the node you want to shut down. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults

Nodes are in the up state.

Command Modes

Administration configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	This command was supported on the Cisco XR 12000 Series Router.
	This command was modified from the hw-module node shutdown command. The node keyword was replaced by the location keyword, which was moved to the end of the command string.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Nodes that are shut down still have power, but cannot load or operate Cisco IOS XR software.



Note

Route processors (RPs) cannot be administratively shut down.

■ hw-module shutdown

Enter the **show platform** command in EXEC mode to display the results of the **hw-module shutdown** command.

Task ID	Task ID	Operations
	root-system	read, write (on the Cisco CRS-1)
	sysmgr	read, write (on the Cisco XR 12000 Series Router)
	root-lr	read, write

Examples

The following example shows how to administratively shut down the node 0/2/CPU0:

```
RP/0/RP0/CPU0:router # admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# hw-module shutdown location 0/2/CPU0
```

The following example shows how to bring up a node using the **no** form of the **hw-module shutdown** command:

```
RP/0/RP0/CPU0:router # admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# no hw-module shutdown location 0/2/CPU0
```

Related Commands

Command	Description
hw-module power	Powers on a specified node. (Cisco CRS-1 router only)
hw-module power disable	Disables the node power-on feature on a specific node. (Cisco XR 12000 Series Router only)
hw-module reset auto	Reloads a specified node. (Cisco CRS-1 only)
hw-module reset auto disable	Disables the node reset feature on a specific node. (Cisco XR 12000 Series Router only)

hw-module subslot reload

To reload Cisco IOS XR software on a specific subslot, use the **hw-module subslot reload** command in EXEC mode.

hw-module subslot *subslot-id* **reload**

Syntax Description	<i>subslot-id</i>	Specifies the subslot to be restarted. The <i>subslot-id</i> argument is entered in the <i>rack/slot/subslot</i> notation.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

This command reloads Cisco IOS XR software on the specified shared port adapter (SPA) and restarts the SPA interfaces. The SPA reloads with the current running configuration and active software set for the SPA.

Task ID	Task ID	Operations
	root-lr	read, write

Examples	The following example shows how to restart the SPA in slot 2, subslot 1:

```
RP/0/RP1/CPU0:router# hw-module subslot 0/2/1 reload
```

hw-module subslot reload

Related Commands

Command	Description
hw-module subslot shutdown	Administratively shuts down a SPA.

hw-module subslot shutdown

To administratively shut down a specific shared port adapter (SPA), use the **hw-module subslot shutdown** command in global configuration 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/slot/subslot</i> notation.
powered	(Optional) Retains power to the specified subslot.
unpowered	(Optional) Powers down completely the specified subslot.

Defaults

Shutdown is powered if no option is specified.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

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

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-Ir	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/RP1/CPU0:router# configure  
RP/0/RP1/CPU0:router(config)# hw-module subslot 0/2/1 shutdown powered
```

Related Commands

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

redundancy switchover

To cause the primary (active) route processor (RP) to fail over to the redundant standby RP, use the **redundancy switchover** command in EXEC or administration EXEC mode. To disable the forced failover, use the **no** form of this command.

redundancy switchover [**location** *node-id*]

no redundancy switchover [**location** *node-id*]

Syntax Description

location <i>node-id</i>	(Optional) Specifies the primary RP on which to force a failover. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	This command was first supported on the Cisco XR 12000 Series Router. The redundancy switchover command was moved from the system task ID to the root-lr task ID.
Release 3.4.0	No modification.
Release 3.5.0	This command was supported in administration EXEC mode.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **redundancy switchover** command to trigger a failover 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 failover, 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 failover 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 redundancy status of the RPs.

service-location (firewall, VASI)

To associate a physical location on a service card with a firewall, or VRF-Aware Service Infrastructure (VASI) interface service instance, and, optionally, to configure a standby location for service failover, use the **service-location** command in the appropriate service configuration mode. To remove the association, use the **no** form of this command.

service-location preferred-active *node-id* [**preferred standby** *node-id* [**auto-revert**]]

no service-location preferred-active *node-id* [**preferred standby** *node-id* [**auto-revert**]]

Syntax Description	preferred-active <i>node-id</i>	Specifies the physical location of the service card on which you prefer that the service should be active. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	preferred-standby <i>node-id</i>	(Optional) Specifies a standby physical location for the service. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	auto-revert	(Optional) Specifies that the service revert to the preferred active firewall when the active node comes back up after a switchover.
	Note Do not use auto-revert with more than 100 contexts in your configuration.	

Defaults No default behavior or values

Command Modes Firewall configuration
VASI interface configuration

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **service-location** command to specify the location of the service card to handle a VASI virtual interface. The **service-location** command can be configured on either of the interface halves, but if it is configured on both, the locations given must match exactly. If the **service-location** command is not configured, both halves of the pair remain down.

Task ID	Task ID	Operations
	firewall	read, write

Examples

The following example shows how to create a firewall named “fw1” in Cisco IOS XR software and associate it with the physical location at 0/0/cpu0:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# firewall fw1
RP/0/0/CPU0:router(config-firewall)# service-location preferred-active 0/0/CPU0
preferred-standby 0/1/CPU0 auto-revert
```

The following example shows how to use the **service-location** command to enable a VASI interface:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# interface vasileft 1
RP/0/0/CPU0:router(config-if)# vrf red
RP/0/0/CPU0:router(config-if)# ipv4 address 10.1.2.171 255.255.255.0
RP/0/0/CPU0:router(config-if)# service-location preferred-active 0/0/CPU0
preferred-standby 0/1/CPU0 auto-revert
```

Related Commands

Command	Description
default-interface-name	Configures the default interface that represents any unprotected interface in the router.
failure-action	Configures the action to take if a failure or misconfiguration occurs.
firewall	Configures a virtual firewall in Cisco IOS XR software.
firewall (interface)	Configures the firewall attachment.
interface vasi	Configures a VASI interface and enters interface configuration mode.
show services role	Displays the configured roles of the service cards.
show services redundancy	Displays all configured services and their active and standby physical locations,

show dsc

To display the current designated shelf controller (DSC) configuration for the shelf or for the system, enter the **show dsc** command in administration EXEC mode.

show dsc [**all** | **mine** | **location** *node-id*]

Syntax Description

all	(Optional) Displays DSC information from all available nodes in the system.
mine	(Optional) Displays information about the current node.
location <i>node-id</i>	(Optional) Displays DSC information for a specific node. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	The node keyword was replaced by the location keyword. The show dsc command was moved from the root-system task ID to the system task ID.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

For more information about identifying and selecting a DSC on a Cisco CRS-1 router, Cisco XR 12000 Series Router, or Cisco CRS-1 Multishelf System, refer to *Cisco IOS XR Getting Started Guide*.

Task ID	Task ID	Operations
	system	read

Examples

The following is sample output from the **show dsc mine** command on a Cisco CRS-1 router:

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

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

```

NODE          ROLE          PRIORITY      TBEACON    PRESENT    MIGRATION
=====
0/0/CPU0      DSC             3             2000       YES        ENABLED
-----
```

Table 28 describes the significant fields shown in the display.

Table 28 *show dsc Field Descriptions*

Field	Description
NODE	Location of the node, in the <i>rack/slot/module</i> notation.
ROLE	Role this node is performing. Because the show dsc command shows the DSC node, the ROLE is always DSC.
PRIORITY	DSC priority assigned to this node.
TBEACON	Current DSC beacon timeout value.
PRESENT	Indicates whether the node is present in the slot.
SERIAL ID	Serial ID assigned to this node.
MIGRATION	Displays the current DSC migration functionality to the standby card. Can be one of the following: - ENABLE—Migration process is enabled - UNKNOWN—Migration configuration is unknown.

The following is sample output from the **show dsc all** command on a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router(admin)# show dsc all
```

```

NODE          ROLE          PRIORITY      TBEACON    PRESENT    MIGRATION
=====
0/0/CPU0      DSC             3             2000       YES        ENABLED
-----
0/5/CPU0      NON-DSC         5             2000       YES        ENABLED
-----
```

Table 28 describes the significant fields shown in the display.

Related Commands

Command	Description
dsc serial	Defines a serial ID for a rack.

show environment

To display environmental monitor parameters for the system, use the **show environment** command in EXEC mode or administration EXEC mode.

On the Cisco CRS-1 router, in EXEC mode:

```
show environment [all | last | leds | location {all | node-id} | table | temperatures | voltages]
[node-id]
```

On the Cisco CRS-1 router, in administration EXEC mode:

```
show environment [all | fans | last | leds | location {all | node-id} | power-supply | table |
temperatures | trace | voltages] [node-id]
```

On the Cisco XR 12000 Series Router, in EXEC mode:

```
show environment [all | table | temperatures | voltages] [last] [node-id]
```

On the Cisco XR 12000 Series Router, in administration EXEC mode:

```
show environment [all | fans | last | leds | power-supply | table | temperatures | voltages]
[node-id]
```

Syntax Description

all	(Optional) Displays information for all environmental monitor parameters.
last	(Optional) Displays information for prior environmental monitor parameters.
fans	(Optional) Displays information about the fans.
leds	(Optional) Displays monitor parameters for LEDs on all cards in the node.
location {all node-id}	(Optional) Displays all environmental monitor parameters for the specified location only.
table	(Optional) Displays environmental parameter ranges.
temperatures	(Optional) Displays system temperature information.
power-supply	(Optional) Displays power supply voltage and current information.
trace	(Optional) Displays trace data for environment monitoring.
voltages	(Optional) Displays system voltage information.
<i>node-id</i>	(Optional) Identifies the node whose information you want to display. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults

All environmental monitor parameters are displayed.

Command Modes

EXEC
Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	The optional <i>node-id</i> argument was supported on the Cisco CRS-1.
		The show environment command was moved from the root-system task ID to the system task ID.
	Release 3.4.0	No modification.
	Release 3.5.0	The trace keyword was added on the Cisco CRS-1 in administration EXEC mode.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	Support was added for the location , all , and <i>node-id</i> keywords and argument.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 is sample output from the **show environment** command with the **temperatures** keyword:

```
RP/0/RP0/CPU0:router# show environment temperatures
```

R/S/I	Modules	Inlet Temperature (deg C)	Exhaust Temperature (deg C)	Hotspot Temperature (deg C)
0/2/*	host	31, 27	43, 45	48
	cpu			31
	fabricq0			46
	fabricq1			44
	ingressq			34
	egressq		41	43
	ingresspse			35
	egresspse			42
	plimasic	30, 31	42	
0/RP1/*	host	38		44
	cpu			36
	ingressq			42
	fabricq0			43
0/SM0/*	host	29, 29		41, 33

Table 29 describes the significant fields shown in the display.

Table 29 *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_num/slot_num/*</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)	Displays the current temperature of the hotspot in degrees Celsius.

The following is sample output from the **show environment** command the with the **leds** keyword:

```
RP/0/RP0/CPU0:router# show environment leds

0/2/*: Module (host) LED status says: OK
0/2/*: Module (plimasic) LED status says: OK
0/SM0/*: Module (host) LED status says: OK
```

Table 30 describes the significant fields shown in the display.

Table 30 *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.

show fpd package

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

show fpd package

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Administration EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.4.1	The show fpd package command output was updated to display the ROMMON images.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 partial sample output from the **show fpd package** command:

RP/0/0/CPU0:Router# **admin**

RP/0/0/CPU0:Router(admin)# **show fpd package**

```
=====
                        Field Programmable Device Package
=====
```

Card Type	FPD Description	Type	Subtype	SW Version	Min Req HW Vers
CRS1-SIP-800	JACKET FPGA swv2.0	lc	fpga	2.0	0.0
	FPGA swv2.0 hwv80	lc	fpga	2.0	0.80
8-10GBE	FPGA swvA.0	lc	fpga	10.0	0.0
Route Processor	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
SC	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
HQ Route Processor	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
Shelf Controller GE	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
Route Processor B	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
Shelf Controller GE2	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
DRP	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
DRP_B	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.43	0.0
	ROMMONA swv1.43 sp	lc	rommonA	1.43	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
S1S2S3	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
S1S3	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0

	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
S2	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
Fabric HS123	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
Fabric HS123 Star	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
Fabric HS13 Star	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
Fabric QQS123	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
LED	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
YYY-XXXIface	ROMMONA swv1.43 asmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 dsmp	lc	rommonA	1.32	0.0
	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 asmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 dsmp	lc	rommon	1.43	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
PSAL	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
FAN	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
FC Fan Controller	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
LED	ROMMONA swv1.43 sp	lc	rommonA	1.32	0.0
	ROMMONB swv1.43 sp	lc	rommon	1.43	0.0
SPA-4XT3/E3	SPA E3 Subrate FPGA	spa	fpga2	1.4	0.0
	SPA T3 Subrate FPGA	spa	fpga3	1.4	0.0
	SPA I/O FPGA	spa	fpga	1.0	0.0
	SPA ROMMON	spa	rommon	2.12	0.0
SPA-2XT3/E3	SPA E3 Subrate FPGA	spa	fpga2	1.4	0.0
	SPA T3 Subrate FPGA	spa	fpga3	1.4	0.0
	SPA I/O FPGA	spa	fpga	1.0	0.0
	SPA ROMMON	spa	rommon	2.12	0.0
SPA-OC192POS	SPA FPGA swv1.3	spa	fpga	1.3	0.0
SPA-8XOC12-POS	SPA FPGA swv1.0	spa	fpga	1.0	0.5
SPA-4XOC3-POS	SPA FPGA swv3.4	spa	fpga	3.4	0.0
SPA-OC192POS-XFP	SPA FPGA swv1.2	spa	fpga	1.2	0.0
SPA-8X1GE	SPA FPGA swv1.8	spa	fpga	1.8	0.0
SPA-2XOC48POS/RPR	SPA FPGA swv1.0	spa	fpga	1.0	0.0
SPA-4XOC48POS/RPR	SPA FPGA swv1.0	spa	fpga	1.0	0.0
SPA-10X1GE-V2	SPA FPGA swv1.10	spa	fpga	1.10	0.0

show fpd package

SPA-8X1GE-V2	SPA FPGA swv1.10	spa fpga	1.10	0.0
SPA-5X1GE-V2	SPA FPGA swv1.10	spa fpga	1.10	0.0
SPA-1X10GE-L-V2	SPA FPGA swv1.9	spa fpga	1.9	0.0
SPA-1X10GE-WL-V2	SPA FPGA swv1.11	spa fpga	1.11	0.0

Table 31 describes the significant fields shown in the display.

Table 31 *show fpd package Field Descriptions*

Field	Description
Card Type	Type of card that is associated with this FPD.
FPD Description	Currently running FPD type and image version.
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 - rommon—read-only memory monitor - rommon2—read-only memory monitor 2
SW Version	Currently running FPD image version.
Min Req HW Version	Minimum required hardware version for the associated FPD image.

Related Commands

Command	Description
show hw-module fpd	Displays the FPD compatibility for all modules or for a specific module.
upgrade hw-module fpd	Manually upgrades the current 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 appropriate mode.

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

Syntax Description	location	Specifies the location of the module.
	all	Specifies all modules in the router.
	node-id	Location of the module in the <i>rack/slot/module</i> notation.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.4.1	The show hw-module fpd command output was updated to display the ROMMON images.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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/0/0/CPU0:Router# **show hw-module fpd location all**

```

=====
Existing Field Programmable Devices
=====
Location      Card Type      HW      Version Type Subtype Inst  Current SW Upg/
=====
0/0/SP        YYY-XXXIface   255.254 lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/0/CPU0      CRS1-SIP-800   0.104  lc      fpga    0      2.0     No
                lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/0/0         SPA-OC192POS-XFP 2.1    spa     fpga    0      1.2     No
-----
0/0/1         SPA-10X1GE-V2   1.0    spa     fpga    1      1.10    No
-----
0/0/2         SPA-1X10GE-L-V2 1.0    spa     fpga    2      1.9     No
-----
0/0/5         SPA-5X1GE-V2    1.0    spa     fpga    5      1.10    No
-----
0/2/SP        YYY-XXXIface   255.254 lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/2/CPU0      YYY-XXXIface   255.254 lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/RP0/CPU0    HQ Route Processor 0.1    lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/SM0/SP      Fabric HS123    0.1    lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/SM1/SP      Fabric HS123    0.1    lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/SM2/SP      Fabric HS123    0.1    lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
-----
0/SM3/SP      Fabric HS123    0.1    lc      rommonA 0      1.43    No
                lc      rommon  0      1.43    No
=====

```

Table 32 describes the significant fields shown in the display.

Table 32 *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.

Table 32 *show hw-module fpd Field Descriptions (continued)*

Field	Description
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.
Upg/Dng	Specifies whether an FPD upgrade or downgrade is required. A downgrade will be 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 FPD image package is needed for the router to properly support the modules for the running Cisco IOS XR software release. Also indicates all available FPD images that are available for a specific module.
upgrade hw-module fpd	Manually upgrades the current FPD image package on a module.

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 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/module</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.) • 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. • 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.

Defaults No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 is 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 34](#) describes the significant fields shown in the display.

Table 33 *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 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 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/module</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.) • 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. • 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.

Defaults No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 is sample output for the **show hw-module subslot config** command:

```
RP/0/RP1/CPU0:router# show hw-module subslot 0/2/cpu0 config
```

```
BAY 0 config info:
-----
SPA inserted: YES
SPA cfg admin up: YES
SPA cfg power up: YES
```

```
BAY 1 config info:
-----
SPA inserted: YES
SPA cfg admin up: YES
SPA cfg power up: YES
```

[Table 34](#) describes the significant fields shown in the display.

Table 34 *show hw-module subslot config Field Descriptions*

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

 show hw-module subslot config**Table 34** *show hw-module subslot config Field Descriptions (continued)*

Field	Description
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 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/module</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.) • 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. • 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.

Defaults No default behavior or values

Command Modes EXEC

■ **show hw-module subslot counters****Command History**

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

Task ID	Operations
root-lr	read

Examples

The following is sample output for the **show hw-module subslot counters** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/2/cpu0 counters
```

```
BAY 0 counts info:
```

```
-----
```

```
SPA inserted: YES
```

```
SPA type:      5xGE SPA
```

```
SPA operational state: READY
```

```
SPA insertion time:  Fri Nov 19 01:49:07 2004
```

```
SPA last time ready: Fri Nov 19 01:49:42 2004
```

```
SPA uptime [HH:MM:SS]: 49:49:29
```

```
BAY 1 counts info:
```

```
-----
```

```
SPA inserted: YES
```

```
SPA type:      1xOC192 POS/RPR HHSPA with XFP
```

```
SPA operational state: READY
```

```
SPA insertion time:  Fri Nov 19 01:49:08 2004
```

```
SPA last time ready: Fri Nov 19 01:49:35 2004
```

```
SPA uptime [HH:MM:SS]: 49:49:36
```

Table 35 describes the significant fields shown in the display.

Table 35 *show hw-module subslot counters 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 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 is sample output for the **show hw-module subslot counters** command with the **framer** option:

```
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 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/module</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.) • 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. • 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.

Defaults No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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:

```
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
```

show hw-module subslot errors

```

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 36 describes the significant fields shown in the display.

Table 36 *show hw-module subslot errors Field Descriptions*

Field	Description
Subslot */*/ errors info	Indicates the SPA whose error information is being displayed. The location of the SPA is expressed in the <i>rack/slot/module</i> notation.
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 operational state of the SPA module.
SPA last reset reason	Displays the 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 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/module</i> notation.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.5.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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

show hw-module subslot plim-subblock**Examples**

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

```
RP/0/0/CPU0:router# show hw-module subslot 0/5/0 plim-subblock

Subslot 0/5/0 Plim Subblock Info:
-----

Firmware information:
  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 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/module</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.) • 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. • 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.

Defaults No default behavior or values

Command Modes EXEC

■ show hw-module subslot registers

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 0/2/CPU0 registers
```

```
BAY 0 registers info:
```

```
-----
```

```
SPA hardware ID : 0x1
```

```
SPA SW FPGA rev.: 0x10
```

```
BAY 1 registers info:
```

```
-----
```

```
SPA hardware ID : 0x90000000
```

```
SPA SW FPGA rev.: 0xD
```

Table 37 describes the significant fields shown in the display.

Table 37 *show hw-module subslot registers Field Descriptions*

Field	Description
SPA hardware ID	SPA hardware identifier in hexadecimal format.
SPA SW FPGA rev.	SPA software FPGA ¹ revision number in hexadecimal format.

1. field-programmable gate array

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 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/module</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.) • 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. • 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.

Defaults No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/RP1/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 38](#) describes the significant fields shown in the display.

Table 38 *show hw-module subslot status Field Descriptions*

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

 `show hw-module subslot status`

Related Commands	Command	Description
	<code>show controllers</code>	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 EXEC or administration EXEC mode.

In EXEC mode:

```
show inventory [node-id | all | location {node-id | all} | raw]
```

In administration EXEC mode:

```
show inventory [node-id | all | chassis | fans | location {node-id | all} | power-supply | raw]
```

Syntax Description		
<i>node-id</i>	(Optional)	Identifies the location of a specific node whose inventory information you want to display. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
all	(Optional)	Displays inventory information for all the physical entities in the chassis.
location { <i>node-id</i> all }	(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.
fans	(Optional)	Displays inventory information for the fans.
power-supply	(Optional)	Displays inventory information for the power supply.

Defaults	All inventory information for the entire chassis is displayed.

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	This command was first supported on the Cisco CRS-1. The root-system task ID was removed from the show inventory command.
	Release 3.4.0	No modification.
	Release 3.5.0	Support for SFP information was added to the Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

If a Cisco entity is not assigned a product ID (PID), that entity is not retrieved or displayed.

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.

**Note**

The **raw** keyword is primarily intended for troubleshooting problems with the **show inventory** command itself.

If any of the Cisco products do not have an assigned PID, then the output may display incorrect PIDs, and the version ID (VID) and serial number (SN) elements may be missing.

For UDI compliance products, the PID, VID, and SN are stored in EEPROM and NVRAM. Use the **show inventory** command to display this information.

Prior to Cisco IOS XR Software Release 3.5.0, information for small form-factor pluggable (SFP) modules was not provided for the Cisco XR 12000 Series Router. Information for the following entities is not provided for the Cisco XR 12000 Series Router as of Cisco IOS XR Software Release 3.6.0:

- Power supply
- Fan trays and fans
- Flash memory devices
- Hard disk

Task ID**Task ID Operations**

sysmgr	read

Examples

The following is partial sample output from the **show inventory** command with the **raw** keyword:

```
RP/0/0/CPU0:router(admin)# show inventory raw
```

```
NAME: "0/1/*", DESCR: "Cisco CRS-1 Series Modular Services Card"
PID: CRS-MSC, VID: V02, SN: SAD09280BS9
```

```
NAME: "0/1/* - host", DESCR: "host"
PID: , VID: N/A, SN:
```

```
NAME: "0/1/* - host - Inlet0", DESCR: "Temperature Sensor"
PID: , VID: N/A, SN:
```

```
NAME: "0/1/* - host - Inlet1", DESCR: "Temperature Sensor"
PID: , VID: N/A, SN:
```

```
NAME: "0/1/* - host - Exhaust0", DESCR: "Temperature Sensor"
PID: , VID: N/A, SN:
```

```
NAME: "0/1/* - host - Exhaust1", DESCR: "Temperature Sensor"
```



```

PID:                , VID: N/A, SN:

NAME: "0/1/* - host - Hotspot0", DESCR: "Temperature Sensor"
PID:                , VID: N/A, SN:

NAME: "0/1/* - host - 1.25V_ME0", DESCR: "Voltage Sensor"
PID:                , VID: N/A, SN:
--More--

```

The following is partial sample output from the **show inventory** command:

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

```

ue Apr 27 02:57:55.671 DST
[KNAME: "0/6/*", DESCR: "Cisco CRS-1 Series Modular Services Card"
PID: CRS-MSC                , VID: V03, SN: SAD093702ES

NAME: "0/PL6/*", DESCR: "Cisco Carrier Routing System SPA Interface Processor Card"
PID: CRS1-SIP-800           , VID: V01, SN: SAD094203W2

NAME: "0/6/CPU0/129", DESCR: "CPU_PORT_1"
PID:                        , VID: N/A, SN:

NAME: "0/6/0", DESCR: "4-port OC3/STM1 POS Shared Port Adapter"
PID: SPA-4XOC3-POS          , VID: V01, SN: JAB093309MG

NAME: "0/6/1", DESCR: "Cisco 1-Port 10GE LAN/WAN-PHY Shared Port Adapter"
PID: SPA-1X10GE-WL-V2       , VID: V01, SN: JAE11474EVC

NAME: "0/6/4", DESCR: "8-port OC12/STM4 POS Shared Port Adapters"
PID: SPA-8XOC12-POS         , VID: V01, SN: JAB094706L9

NAME: "0/6/5", DESCR: "8-port Gigabit Ethernet Shared Port Adapter"
PID: SPA-8X1GE              , VID: V01, SN: SAD093909GM

NAME: "0/RP0/*", DESCR: "Cisco CRS-1 Series 8 Slots Route Processor"
PID: CRS-8-RP               , VID: V01, SN: SAD093507HX
--More--

```

Table 39 describes the significant fields shown in the display.

Table 39 *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>node_type/rack</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. A description value of “CPU_PORT_0” indicates a control Ethernet port on the CPU module.
PID	Physical model name of the chassis or node.
VID	Physical hardware revision of the chassis or node.
SN	Physical serial number for the chassis or node.

show led

To display LED information for the router, or for a specific LED location, use the **show led location** command in EXEC or administration EXEC mode.

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

Syntax Description

location {*node-id* | **all**}

(Optional) Displays LED information for a single LED location or for the entire router.

Enter the **all** keyword to display LED information for the entire router, or use the *node-id* argument to specify LED location. The *node-id* argument is expressed in the *rack/slot/module* notation.

Note Enter the **show platform** command to see the location of all nodes installed in the router.

Defaults

The default is to enter the **show led** command without including any optional parameters to display information about all LEDs on the router.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	The show led command was moved from the root-system task ID to the system task ID. The show led command was supported in administration EXEC mode.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	system	read

Examples

The following is sample output from the **show led location** command with the **all** keyword on a Cisco CRS-1 router:

```
RP/0/RP0/CPU0:router# show led location all
```

LOCATION	MESSAGE	MODE	STATUS
0/1/*	IOS XR	DEFAULT	UNLOCKED
0/4/*	ACTVDRP	DEFAULT	UNLOCKED
0/6/*	IOS XR	DEFAULT	UNLOCKED
0/RP0/*	ACTV RP	DEFAULT	UNLOCKED
0/RP1/*	STBYRDY	DEFAULT	UNLOCKED

Table 40 describes the significant fields shown in the display.

Table 40 *show led location Field Descriptions*

Field	Description
LOCATION	Identifies the location of the node. LOCATION is expressed in the <i>rack/slot/module</i> notation.
MESSAGE	Current message displayed by the LED.
MODE	Current operating mode of the specified node.
STATUS	Current status of the specified node.

The following is sample output from the **show led location** command with the **all** keyword on a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# show led location all
```

LOCATION	MESSAGE	MODE	STATUS
0/0/CPU0	ACTVRP	DEFAULT	UNLOCKED
0/1/CPU0	PSC1	DEFAULT	UNLOCKED
0/2/CPU0	IOX RUN	DEFAULT	UNLOCKED
0/3/CPU0	IOX RUN	DEFAULT	UNLOCKED
0/4/CPU0	IOX RUN	DEFAULT	UNLOCKED
0/5/CPU0	IOX RUN	DEFAULT	UNLOCKED

show mbus

To display Mbus Controller Area Network (CAN) errors and interface counters, use the **show mbus** command in administration EXEC mode.

show mbus { **can-error** | **counters** } **location** { *node-id* | **all** }

Syntax Description

can-error	Displays CAN bus error statistics.
counters	Displays information about the firmware packets that were dropped.
location all	Displays Mbus information for all nodes installed in the router.
location node-id	Identifies the location of the node whose CAN errors and interface counters you want to display. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
Note Enter the show platform command to see the location of all nodes installed in the router.	

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.3.0	The root-system task ID was removed from the show mbus command.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
sysmgr	read

Examples

The following is sample output from the **show mbus** command with the **can-error** and **location** keywords:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show mbus can-error location 0/0/CPU0
```

```
Slot #   Stuff   Form   Ack   Bit_1   Bit_0   CRC
0         0       0       0       0       0       0
```

Table 41 describes the significant fields shown in the display.

Table 41 *show mbus can-error Field Descriptions*

Field	Description
Slot	Slot that contains the node whose Mbus counters are displayed.
Stuff	Number of stuff errors on the node.
Form	Number of form errors on the node.
Ack	Number of acknowledgement errors on the node.
Bit_1	Number of Bit_1 errors on the node.
Bit-0	Number of Bit_0 errors on the node.
CRC	Number of CRC ¹ errors.

1. cyclic redundancy check

The following is sample output from the **show mbus** command with the **location** keyword:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show mbus counters location 0/0/CPU0
```

```
Slot #   Mbox    Mbox    Mbus    Mbus    Obj
        Xmit    Rcv     Xmit    Rcv     Ovr_wr
0         0       0       0       0       0
```

Table 42 describes the significant fields shown in the display.

Table 42 *show mbus counters Field Descriptions*

Field	Description
Slot	Identifies the slot that contains the node whose Mbus counters are displayed.
Mbox Xmit	Number of packets dropped due to Mbox transmit errors. Note MBox is a chunk of the MP DMEM ¹ that receives MIPC messages. The Norm Priority mailbox has a buffer of 32 KB, while the high-priority Mbox has a buffer of 8 KB.
Mbox Rcv	Number of packets dropped due to Mbox receive errors.
Mbus Xmit	Number of packets dropped due to Mbus transmit errors. Note The Mbus is a low-bandwidth (1 megabit per second) serial bus that connects cards, switch fabric cards, power supplies, and blower/fan assemblies to the PRPs ² and counters.
Mbus Rcv	Number of packets dropped due to Mbus receive errors.

Table 42 *show mbus counters Field Descriptions (continued)*

Field	Description
Obj Ovr_wr	Number of packets that were overwritten.

1. Maintenance Processor Data Memory
2. performance route processors

Related Commands

Command	Description
clear mbus-statistics location	Clears all Mbus interface counters on a specific node.

show operational

To display all operational data provided as XML schema, use the **show operational** command in EXEC or administration EXEC mode.

show operational *mda-class* [*mda-class* [*mda-class/naming=value*] ...] [**xml**]

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. To view all available MDA classes, use the question mark (?) online help function.
xml	Displays the output in XML format.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	Support for the descriptive keyword was removed. Support for the xml keyword was added.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The required task ID depends on the MDA class for which you are displaying the information.

Examples

The following is sample output from the **show operational** command with the **BGP DefaultVRF GlobalProcessInfo** MDA class and **descriptive** keyword. Not all the output is shown.

```
RP/0/0/CPU0:router# show operational BGP Active DefaultVRF GlobalProcessInfo descriptive

[BGP Active 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 ]
```

The following is sample output from the **show operational** command where only the top-level MDA class is specified. Not all of the output is shown.

```
RP/0/0/CPU0:router# show operational Inventory

[Inventory RackTable Rack/Number=0 SlotTable Slot/Number=1 BasicAttributes BasicInfo]
  Description: "Cisco CRS1 Line Card / Distributed Route Processor card slot"
  VendorType: "1.3.6.1.4.1.9.12.3.1.5.144"
  Name: "0/1"
.
.
.
  CompositeClassCode: 196742
  PhysicalLayerInterfaceModuleType: 6291590
[Inventory RackTable Rack/Number=0 SlotTable Slot/Number=1 BasicAttributes FRUInfo]
.
.
.
[Inventory RackTable Rack/Number=0 SlotTable Slot/Number=1 CardTable Card/Number=0
BasicAttribute BasicInfo]
.
.
.
[Inventory RackTable Rack/Number=0 SlotTable Slot/Number=RP1 BasicAttributes BasicInfo]
  Description: "Cisco CRS1 Line Card slot"
  VendorType: "1.3.6.1.4.1.9.12.3.1.5.144"
  Name: "0/1"
.
.
.
  CompositeClassCode: 196742
  PhysicalLayerInterfaceModuleType: 6291590

[Inventory RackTable Rack/Number=0 SlotTable Slot/Number=RP1 BasicAttributes FRUInfo]
```


show platform

To display information and status for each node in the system, use the **show platform** command in EXEC or administration EXEC mode.

On the Cisco CRS-1 router:

```
show platform [node-id]
```

On the Cisco XR 12000 Series Router:

```
show platform
```

Syntax Description

<i>node-id</i>	(Optional) Node for which you want to display information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
Note	The <i>node-id</i> argument is available on the Cisco CRS-1 router only.

Defaults

Cisco CRS-1 router: Status and information are displayed for all nodes in the system.
Cisco XR 12000 Series Router: No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	The show platform command was first supported in administration EXEC mode. On the Cisco CRS-1, the EXEC mode show platform command was moved from the root-system task ID to the system task ID.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

■ **show platform**

The **show platform** command provides a summary of the nodes in the system, including node type and status.

Enter the **show platform** command in administration EXEC mode to display output for the entire system. Enter the **show platform** command in EXEC mode to display output for only those nodes that belong to the SDR on which the command is executed.

Task ID

Task ID	Operations
sysmgr	read (on the Cisco XR 12000 Series Router only)
system	read (in EXEC mode on the Cisco CRS-1 only)
root-system	read (in administration EXEC mode on the Cisco CRS-1 only)

Examples

The following is sample output from the **show platform** command:

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

Node	Type	PLIM	State	Config State
0/1/CPU0	MSC	Jacket Card	IOS XR RUN	PWR, NSHUT, MON
0/1/0	MSC (SPA)	4XOC3-POS	OK	PWR, NSHUT, MON
0/1/5	MSC (SPA)	8X1GE	OK	PWR, NSHUT, MON
0/6/CPU0	MSC	Jacket Card	IOS XR RUN	PWR, NSHUT, MON
0/6/0	MSC (SPA)	4XOC3-POS	OK	PWR, NSHUT, MON
0/6/4	MSC (SPA)	8XOC3/OC12-POS	OK	PWR, NSHUT, MON
0/6/5	MSC (SPA)	8X1GE	OK	PWR, NSHUT, MON
0/RP0/CPU0	RP (Active)	N/A	IOS XR RUN	PWR, NSHUT, MON
0/RP1/CPU0	RP (Standby)	N/A	IOS XR RUN	PWR, NSHUT, MON

The following is sample output for the **show platform** command with the *node-id* argument:

```
RP/0/RP0/CPU0:router# show platform 0/1/0
```

Node	Type	PLIM	State	Config State
0/1/0	MSC (SPA)	4XOC3-POS	OK	PWR, NSHUT, MON

[Table 43](#) describes the significant fields shown in the display.

Table 43 *show platform Field Descriptions*

Field	Description
Node	Identifies the node, in the <i>rack/slot/module</i> format.
Type	Type of node.
PLIM	Type of PLIM ¹ currently supported on the module.
State	Current state of the specified node.
Config State	Current status of the specified node.

1. physical layer interface module

Related Commands

Command	Description
show environment	Displays environmental monitor parameters for the system.

show redundancy

To display the status of route processor redundancy, use the **show redundancy** command in EXEC mode.

show redundancy [**location** {*node-id* | **all**} | **statistics** [**trace**] | **summary**]

Syntax Description

location	(Optional) Specifies the location of the node or nodes whose redundancy information you want to display. You can display information about a specific node, or about all nodes in the router.
<i>node-id</i>	Node whose redundancy information you want to display. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
all	Displays redundancy information for all nodes installed in the router.
statistics	Displays redundancy statistics information.
trace	Displays redundancy statistics trace data.
summary	(Optional) Displays a summary of all redundant node pairs in the router.

Defaults

Route processor redundancy information is displayed for all nodes in the system.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	The statistics and trace keywords were added.
Release 3.6.0	Nonstop routing (NSR) indication was added to the command display.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show redundancy** command to display the redundancy status of the route processors (RPs). The **show redundancy** command also displays the boot and switchover history for the RPs. To view the nonstop routing (NSR) status of the standby RPs in the system, use the **summary** keyword.

Task ID	Task ID	Operations
	system	read
	basic-services	read (for statistics keyword)

Examples

The following is sample output from the **show redundancy** command on a Cisco CRS-1 router:

```
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
```

[Table 44](#) describes the significant fields shown in the display.

Table 44 *show redundancy (Cisco CRS-1) Field Descriptions*

Field	Description
Node */*/* is in XXX role	Current role of the primary route processor, where (*/*/*) is the route processor ID in the format <i>rack/slot/module</i> , and XXX is the role of the route processor (active or standby). In the example, this field shows that the node with the ID 0/RP0/CPU0 is in active role.
Partner node (*/*/*) is in XXX role	Current role of the secondary (or partner) route processor, where (*/*/*) is the route processor ID in the <i>rack/slot/module</i> format, and XXX is the role of the route processor (active or standby). In the example, this field shows that the node with the ID 0/RP1/CPU0 is in standby role.
Standby node in (*/*/*) is ready	Current state of the standby node, where (*/*/*) is the standby route processor ID. In the example, the standby node is ready.
Standby node in (*/*/*) is NSR-ready	Current state of the standby node regarding nonstop routing (NSR), where (*/*/*) is the standby route processor ID. In the example, the standby node is NSR-ready.
Reload and boot info	General overview of the active and standby route processors' reload and boot history.

The following is sample output from the **show redundancy** command on a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# show redundancy

Redundancy information for node 0/0/CPU0:
=====
Node 0/0/CPU0 is in ACTIVE role
Node 0/0/CPU0 has no valid partner

Reload and boot info
-----
PRP reloaded Wed Mar 15 19:50:31 2006: 1 week, 5 days, 18 hours, 57 minutes ago
Active node booted Wed Mar 15 19:50:31 2006: 1 week, 5 days, 18 hours, 57 minutes ago

Redundancy information for node 0/1/CPU0:
=====
Node 0/1/CPU0 is in ACTIVE role
Node 0/1/CPU0 has no valid partner

Reload and boot info
-----
PSC1 reloaded Wed Mar 15 19:51:31 2006: 1 week, 5 days, 18 hours, 56 minutes ago
Active node booted Wed Mar 15 19:51:31 2006: 1 week, 5 days, 18 hours, 56 minutes ago
```

Table 45 describes the significant fields shown in the display.

Table 45 *show redundancy (Cisco XR 12000 Series Router) Field Descriptions*

Field	Description
Node */*/* is in XXX role	Current role of the primary route processor, where (*/*/*) is the route processor ID in the format <i>rack/slot/module</i> , and XXX is the role of the route processor (active or standby). In the example, this field shows that the node with the ID 0/RP0/CPU0 is in active role.
Partner node (*/*/*) is in XXX role	Current role of the secondary (or partner) route processor, where (*/*/*) is the route processor ID in the <i>rack/slot/module</i> format, and XXX is the role of the route processor (active or standby). In the example, this field shows that the node with the ID 0/RP1/CPU0 is in standby role.
Standby node in (*/*/*) is ready	Current state of the standby node, where (*/*/*) is the standby route processor ID. In the example, the standby node is ready.
Reload and boot info	General overview of the active and standby route processors' reload and boot history.

The following sample output shows the status of the redundant RPs in the system:

```
RP/0/RP0/CPU0:router# show redundancy summary

Active Node      Standby Node
-----
 0/4/CPU0        N/A
 0/4/CPU1        N/A
0/RP0/CPU0      0/RP1/CPU0 (Ready, NSR: Ready)
```

The status of the standby node is indicated in parentheses next to the node identifier. The nonstop routing (NSR) status is indicated following NSR:. Possible values are Ready and Not ready.

Related Commands	Command	Description
	redundancy switchover	Causes the primary (active) RP to fail over to the redundant standby RP, if the standby RP is available.

show screddrv

To display system controller (SC) redundancy information, use the **show screddrv** command in EXEC mode.

show screddrv [**all** | **standby**]

Syntax Description

all	(Optional) Displays redundancy details for the entire router.
standby	(Optional) Displays detailed redundancy information for the standby node.

Defaults

SC redundancy information is displayed for all nodes in the system.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	The show screddrv command was moved from the root-system task ID to the system task ID. The arbitration keyword was removed from the show screddrv command.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Enter the **show screddrv** command without any of the optional parameters to display summarized SC redundancy and arbitration information for the router.

Task ID

Task ID	Operations
system	read

Examples

The following is sample output from the **show screddrv** command with the **all** keyword:

```
RP/0/RP0/CPU0:router# show screddrv all

Redundancy Driver Info for slot 32:
Slot=32
Role=active role
State=ACTIVE STATE
Prefer_slot=0
Registers: ICreg=[1], MSreg=[33], MPPReg=[c0005cc8]
Tx error count=0
Rx error count=22
Comm Statistics=5632
SHOW REDDRV ARBITRATION is not supported.
```

Table 46 describes the significant fields shown in the display.

Table 46 *show screddrv Field Descriptions*

Field	Description
Role	Current role of the card in the specified slot; for example, it may be active, standby, and so forth.
State	Current state of the card in the specified slot.
Prefer_slot	Information about the preferred redundancy slot.
Registers	Information about the following registers: • ICreg • MSreg • MPPReg
Tx error count	Number of transmit errors that have occurred on the card in the specified slot.
Rx error count	Number of receive errors that have occurred on the card in the specified slot.
Comm Statistics	Command statistics.
SHOW REDDRV ARBITRATION	Describes whether arbitration is supported or not on this slot. If arbitration is supported, this field provides arbitration information.

show services redundancy

To display all configured services and their active and standby physical locations, use the **show services redundancy** command in EXEC mode.

show services redundancy [**type** *service*] [**brief** | **detail** | **summary**] [**location** *node-id*]

Syntax Description	type <i>service</i>	(Optional) Displays data for a specified service type only.
	brief	(Optional) Displays brief data.
	detail	(Optional) Displays detailed data, including auto-revert setting.
	summary	(Optional) Displays summary data
	location <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/module</i> notation.

Defaults Displays brief data, as when the **brief** keyword is used

Command Modes EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco XR 12000 Series Router.
	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.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID None

Examples

The following example shows sample brief data for all services:

```
RP/0/0/CPU0:router# show services redundancy
Tue Nov 11 10:09:57.382 PST DST
Service type      Name                               Pref. Active      Pref. Standby
-----
Firewall          Admin_1                          0/1/CPU0 Active
IPSec             service-ipsec1                   0/2/1    Active
GRE               service-gre1                     0/2/1    Active
```

The following sample output shows details of all configured services:

```
RP/0/0/CPU0:router# show services redundancy detail
Tue Nov 11 09:24:15.541 PST DST
Service 'Admin_1' of type 'Firewall':
  Preferred active at 0/1/CPU0, Active
  Auto-revert is OFF
Service 'service-ipsec1' of type 'IPSec':
  Preferred active at 0/2/1, Active
  Auto-revert is OFF
Service 'service-gre1' of type 'GRE':
  Preferred active at 0/2/1, Active
  Auto-revert is OFF
```

The following sample output shows a summary of all configured services:

```
RP/0/0/CPU0:router# show services redundancy summary

Tue Nov 11 10:08:25.252 PST DST
Service type      Offline Act Only Act+Stby      Total
-----
Firewall          00000000 00000001 00000000 00000001
IPSec             00000000 00000001 00000000 00000001
GRE               00000000 00000001 00000000 00000001
```

Related Commands

Command	Description
firewall	Configures a virtual firewall in Cisco IOS XR software.
interface service-gre	Creates a static IPSec-protected generic routing encapsulation (GRE) interface.
interface service-ipsec	Creates a static IPSec virtual interface.
interface vasi	Configures a VASI interface and enters interface configuration mode.
service-location (firewall, VASI)	Associates a physical interface with a firewall, or VASI interface service instance,

show services role

To display the current service role on service cards, use the **show services role** command in EXEC mode.

show services role

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	None

Examples	The following example displays sample output from the show services role command:

```
RP/0/0/CPU0:router# show services role
```

```
Tue Sep 2 12:18:58.827 PST DST
Node      Configured Role      Enacted Role      Enabled Services
-----
0/1/CPU0  Firewall              Firewall          <none>
```

Related Commands	Command	Description
	hw-module service firewall location	Configures the firewall service as a role on a multiservice blade (MSB).
	hw-module service offline location	Configures offline mode as the role on a specific node.

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 EXEC mode.

show version

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	The show version command was moved from the sysmgr task ID to the basic-services task ID.
	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.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following example shows partial output from the **show version** command:

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

Cisco IOS XR Software, Version 3.4.0
Copyright (c) 2006 by cisco Systems, Inc.

ROM: System Bootstrap, Version 1.32(20050525:193559) [CRS-1 ROMMON],

CRS-8_P1 uptime is 1 week, 22 hours, 27 minutes
System image file is "disk0:hfr-os-mbi-3.3.90/mbihfr-rp.vm"

cisco CRS-8/S (7457) processor with 4194304K bytes of memory.
7457 processor at 1197Mhz, Revision 1.2

16 Packet over SONET/SDH network interface(s)
16 SONET/SDH Port controller(s)
2 Ethernet/IEEE 802.3 interface(s)
16 GigabitEthernet/IEEE 802.3 interface(s)
2043k bytes of non-volatile configuration memory.
38079M bytes of hard disk.
1000592k bytes of ATA PCMCIA card at disk 0 (Sector size 512 bytes).
1000640k bytes of ATA PCMCIA card at disk 1 (Sector size 512 bytes).

Package active on node 0/1/SP:
hfr-diags, V 3.3.90[1I], Cisco Systems, at disk0:hfr-diags-3.3.90
  Built on Mon Mar 27 12:29:00 UTC 2006
  By edde-bld1 in /vws/aga/production/3.3.90.1I/hfr/workspace for c2.95.3-p8

hfr-admin, V 3.3.90[1I], Cisco Systems, at disk0:hfr-admin-3.3.90
  Built on Mon Mar 27 09:22:26 UTC 2006
  By edde-bld1 in /vws/aga/production/3.3.90.1I/hfr/workspace for c2.95.3-p8

hfr-base, V 3.3.90[1I], Cisco Systems, at disk0:hfr-base-3.3.90
  Built on Mon Mar 27 09:13:04 UTC 2006
  By edde-bld1 in /vws/aga/production/3.3.90.1I/hfr/workspace for c2.95.3-p8

hfr-os-mbi, V 3.3.90[1I], Cisco Systems, at disk0:hfr-os-mbi-3.3.90
  Built on Mon Mar 27 08:34:13 UTC 2006
  By edde-bld1 in /vws/aga/production/3.3.90.1I/hfr/workspace for c2.95.3-p8
--More--
```

Table 47 describes the significant fields shown in the display.

Table 47 *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.

Table 47 *show version Field Descriptions (continued)*

Field	Description
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	Provides details about the current software package that is running on the SP node in slot 1.

1. Synchronous Digital Hierarchy

2. AT Attachment Personal Computer Memory Card Industry Association

upgrade all

To upgrade the fabric-downloader, ROMMON, Mbus, and current field-programmable device (FPD) image package on a module or on all modules installed in a router, use the **upgrade all** command in administration EXEC mode.

upgrade all location {*node-id* | **all**} [**force**]

Syntax Description	location all	Upgrades all ROM images on all line cards (LCs) that are installed in the router.
	location <i>node-id</i>	Upgrades all ROM images on a specific node. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
		Note Enter the show platform command to see the location of all nodes installed in the router.
	force	(Optional) Skips the version check and forces an upgrade.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

The following example shows how to upgrade all ROM images on all line cards that are installed in the router:

```
RP/0/0/CPU0:Router# admin
RP/0/0/CPU0:router(admin)# upgrade all location all
```

Related Commands

Command	Description
clear mbus-statistics location	Clears all Mbus interface counters on a specific node.
show mbus	Displays Mbus CAN errors and interface counters.
show platform	Displays information and status for each node in the system.

upgrade cpuctrlbits

To upgrade the CPU controller bits on all nodes that are installed in the router or on a specific node, use the **upgrade cpuctrlbits** command in administration EXEC mode.

upgrade cpuctrlbits {**all** | **location** *node-id*} [**bootflash** | **disk0** | **disk1** | **internal**]

Syntax Description	all	Upgrades the CPU controller bits on all nodes installed in the router.
	location <i>node-id</i>	Upgrades the CPU controller bits on a specific node. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
		Note Enter the show platform command to see the location of all nodes installed in the router.
	bootflash	(Optional) Uses the images located on the bootflash to upgrade the CPU controller on all nodes, or on the specified node.
	disk0	(Optional) Uses the images located on disk0 to upgrade the CPU controller on all nodes, or on the specified node.
	disk1	(Optional) Uses the images located on disk1 to upgrade the CPU controller on all nodes, or on the specified node.
	internal	(Optional) Uses the images located in the /pkg/bin.
		Note This is the default location for the ROMMON image.

Defaults Default location for the ROMMON image: **internal**

Command Modes Administration EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	The upgrade cpuctrlbits command was moved from the sysmgr task ID to the system task ID.
	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.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **upgrade cpuctrlbits** command is only applicable to boards that use the Squid CPU controller, and not the Squirt controller. Use the **show controller cpuctrl internal** command to determine which CPU controller is used in a specific card, as indicated in bold in the following example:

```
RP/0/RP0/CPU0:router# show controller cpuctrl internal

Cpuctrl Internal Info for node 0/1/CPU0:
  Error Interrupts = 0      Spurious Error Interrupts = 0
  PCI Error Overflows = 0      PCI PM Error Overflows = 0
  PCIIX Error Overflows = 0      Internal Access PCI Overflows = 0
  Port Error Overflows = 0      Error Log Overflows = 0
  cpuctrl Config Reg = 0x8357ffff  cpuctrl Physical Offset = 0x80000000
  cpuctrl Window Size = 0x40000000  cpuctrl Port Window Size = 0x04000000
  cpuctrl SHMem Size = 0x00800000  cpuctrl SHMem Used = 0x00224fb0
  cpuctrl version info: Squid FPGA v2.07 Fri Jan 23 16:21:01 2004 ykoren

Cpuctrl Internal Info for node 0/4/CPU0:
  Error Interrupts = 0      Spurious Error Interrupts = 0
  PCI Error Overflows = 0      PCI PM Error Overflows = 0
  PCIIX Error Overflows = 0      Internal Access PCI Overflows = 0
  Port Error Overflows = 0      Error Log Overflows = 0
  cpuctrl Config Reg = 0xffffffff  cpuctrl Physical Offset = 0x80000000
  cpuctrl Window Size = 0x40000000  cpuctrl Port Window Size = 0x04000000
  cpuctrl SHMem Size = 0x00800000  cpuctrl SHMem Used = 0x00224fb0
  cpuctrl version info: SQUIRT v3
.
.
.
```

Task ID**Task ID****Operations**

system

read, write

Examples

The following example shows how to upgrade the CPU controller bits on all nodes in a router:

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

Please do not power cycle, reload the router or reset any nodes until all upgrades are completed.

Please check the syslog to make sure that all nodes are upgraded successfully.

If you need to perform multiple upgrades, please wait for current upgrade to be completed before proceeding to another upgrade.

Failure to do so may render the cards under upgrade to be unusable.

Related Commands**Command****Description**

**show controller
cpuctrl internal**

Displays information about the internal CPU controller in the cards in the router.

show platform

Displays information and status for each node in the system.

upgrade fabric-downloader

To upgrade the fabric-downloader image package on a module or on all modules installed in a router, use the **upgrade fabric-downloader** command in administration EXEC mode.

upgrade fabric-downloader location {*node-id* | **all**} [**force**]

Syntax Description	location <i>node-id</i>	Upgrades the fabric-downloader on a specific LC. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation. Note Enter the show platform command to see the location of all nodes installed in the router.
	location all	Upgrades the fabric-downloader on all LCs that are installed in the router.
	force	(Optional) Skips the version check and forces an upgrade.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

The following example shows how to upgrade the fabric-downloader image package on a specific node:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# upgrade fabric-downloader location 0/0/CPU0
```

Related Commands

Command	Description
show platform	Displays information and status for each node in the system.

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 administration EXEC mode.

On the Cisco CRS-1 router:

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

On the Cisco XR 12000 Series Router:

```
upgrade hw-module fpd {all | fpga-type | rommon} [force] location [all | node-id] [reload]
```

Syntax Description	
all	Upgrades all FPD images on the selected module.
<i>fpga-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.
rommon	Upgrades the ROMMON image on the 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	Specifies the location of the module.
all	(Optional) Upgrades the FPD image of all modules in the router.
<i>node-id</i>	(Optional) Location of the module. Naming notation is <i>rack/slot/subslot</i> and a slash between values is required as part of the notation. <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the SPA interface processor (SIP). <i>subslot</i>: Subslot number of the SPA. For more information about the syntax for the router, use the question mark (?) online help function.
reload	(Optional) Reloads the module after the FPD image has been updated. If you do not use the reload keyword, you must manually reload the module before the FPD upgrade is complete. Use the hw-module reset or hw-module subslot reload command in EXEC mode to reload the module. Note The reload keyword is available on the Cisco XR 12000 Series Router only.

Defaults No default behavior or values

Command Modes Administration EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	The reload keyword was added to this command. Support for multiple FPGA images was added.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

Task ID

Task ID	Operations
system	read, write (on the Cisco CRS-1 router only)
sysmgr	read, write

Examples

The following example shows how to upgrade the default FPGA on a SPA in the Cisco CRS-1 router:

```
RP/0/RP0/CPU0:Router# admin
RP/0/RP0/CPU0:Router(admin)# upgrade hw-module fpd fpga force location 0/1/4

% RELOAD REMINDER:
- The upgrade operation of the target module will not interrupt its normal
  operation. However, for the changes to take effect, the target module
  will need to be manually reloaded after the upgrade operation. This can
  be accomplished with the use of "hw-module <target> reload" command.
- If automatic reload operation is desired after the upgrade, please use
  the "reload" option at the end of the upgrade command.
- The output of "show hw-module fpd location" command will not display
  correct version information after the upgrade if the target module is
  not reloaded.
Continue? [confirm] y

SP/0/1/SP:Dec 22 05:41:17.920 : upgrade_daemon[125]: programming...with file /ne
t/node0_RP1_CPU0/hfr-lc-3.3.83/fpd/ucode/fpga_gladiator_sw0.6.xsvf
SP/0/1/SP:Dec 22 05:41:28.900 : upgrade_daemon[125]: ...programming...
SP/0/1/SP:Dec 22 05:41:28.906 : upgrade_daemon[125]: ...it will take a while...
SP/0/1/SP:Dec 22 05:41:29.004 : upgrade_daemon[125]: ...it will take a while...
SP/0/1/SP:Dec 22 05:43:03.432 : upgrade_daemon[125]: ...programming...
SP/0/1/SP:Dec 22 05:43:03.438 : upgrade_daemon[125]: ...it will take a while...
Successfully upgraded spa fpga instance 4 on location 0/1/4.
```


The following example shows how to upgrade the default FPGA on a SPA in the Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:Router# admin
RP/0/0/CPU0:Router(admin)# upgrade hw-module fpd fpga force location 0/3/0

% RELOAD REMINDER:
- The upgrade operation of the target module will not interrupt its normal
  operation. However, for the changes to take effect, the target module
  will need to be manually reloaded after the upgrade operation. This can
  be accomplished with the use of "hw-module <target> reload" command.
- If automatic reload operation is desired after the upgrade, please use
  the "reload" option at the end of the upgrade command.
- The output of "show hw-module fpd location" command will not display
  correct version information after the upgrade if the target module is
  not reloaded.
Continue? [confirm] y

LC/0/3/CPU0:Dec 22 06:46:59.732 : spa_192_jacket_v2[203]: %SPA_FPD-6-UPDATE_STAR
T : SPA-4XCT3/DS0[0]: Starting update of FPD 'fpga' image
LC/0/3/CPU0:Dec 22 06:47:23.518 : spa_192_jacket_v2[203]: %SPA_FPD-6-UPDATE_PASS
ED : SPA-4XCT3/DS0[0]: Successfully updated FPD 'fpga' image
Successfully upgraded spa fpga instance 0 on location 0/3/0.
```

Related Commands

Command	Description
show hw-module fpd	Displays the FPD compatibility for all modules or a specific module.
show fpd package	Displays which FPD image package is needed for the router to properly support the modules for the running Cisco IOS XR software release. Also indicates all available FPD images that are available for a specific module.

upgrade mbus

To upgrade the Mbus agent ROM image on a module or on all modules installed in a router, use the **upgrade mbus** command in administration EXEC mode.

upgrade mbus [**force**] **location** {**all** | *node-id*}

Syntax Description

force	(Optional) Skips the version check and forces an upgrade.
location all	Upgrades the Mbus agent ROM on all line cards (LCs) that are installed in the router.
location <i>node-id</i>	Upgrades the Mbus agent ROM on a specific node. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.
Note	Enter the show platform command to see the location of all nodes installed in the router.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

The following example shows how to upgrade the Mbus agent ROM on a specific node:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# upgrade mbus location 0/0/CPU0

Upgrading the MBUS agent rom on slot 0
RP/0/0/CPU0:Nov 18 16:52:23.296 : upgrade_mbus[65703]: %MBUS-6-API_INFO_DUMP : d
ownload status slot 0, DOWNLOAD_SUCCESS
RP/0/0/CPU0:Nov 18 16:52:33.422 : upgrade_mbus[65703]: %MBUS-6-API_INFO_DUMP : d
ownload status slot 0, PROGRAM_ROM SUCCESS
Upgrade complete. Use admin CLI "test mbus soft-reset-agent" or OIR the card to
force new MBUS Rom image to execute.
```

Related Commands

Command	Description
clear mbus-statistics location	Clears all Mbus interface counters on a specific node.
show mbus	Displays Mbus CAN errors and interface counters.
show platform	Displays information and status for each node in the system.



Manageability Commands on Cisco IOS XR Software

This chapter describes the Cisco IOS XR software commands used to enable the HTTP server and to enable router management through Extensible Markup Language (XML) agent services.

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.

For more information about setting up management services, see *Cisco Craft Works Interface Quick Start Guide*.

For more information about setting up the XML agent, see *Cisco IOS XR XML API Guide*.

http server

To enable the HTTP server on the router and enable access to the Craft Works Interface (CWI), use the **http server** command in global configuration mode. To disable the HTTP server, use the **no** form of this command.

http server [**ssl**] [**access-group** *name*]

no http server

Syntax Description

access-group <i>name</i>	(Optional) Enables access to the CWI from IP addresses that meet the conditions of the access control list (ACL) specified for the <i>name</i> argument.
ssl	(Optional) Enables Secure Socket Layer (SSL).

Defaults

The HTTP server is disabled.

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. Support for access groups was added. The access-group keyword and <i>name</i> argument were added to support access groups.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Command Modes

Global configuration

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **http server** command to enable the HTTP server on your router.

To display the home page of the router, use a Web browser pointed to `http://x.x.x.x`, where *x.x.x.x* is the router IP address. If a name has been set, use `http://router-name`.

Use the **http server ssl** command to run HTTP over a secure socket. This command enables the HTTP server to run SSL when accessing web pages or files provided by the HTTP server of the router and disables access through the regular HTTP port.

Use the **no** form of this command to disable the HTTP server.

Enabling the HTTP server enables authentication by default. After the HTTP server has been enabled, you then are prompted to provide a username and password to access web pages on the HTTP server.

**Note**

The **http server** command enables the HTTP server process on Management Ethernet interfaces by default. For information about how to enable HTTP server on other inband interfaces, refer to the *Implementing Management Plane Protection on Cisco IOS XR Software* module in *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations

config-services	read, write

Examples

The following example shows how to enable the HTTP server on the router:

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

The following example shows how to enable SSL to run HTTP over a secure socket:

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

The following example shows how to enable SSL to run HTTP over a secure socket and to enable access to the CWI from only IP address that meeting the conditions of the access group named test:

```
RP/0/RP0/CPU0:router(config)# http server ssl access-group test
```

The following sample output from the **show ipv4 access-lists** commands displays the IPv4 access list named test:

```
RP/0/0/CPU0:router# show ipv4 access-lists test
```

```
ipv4 access-list test
 10 deny ip host 171.71.163.96 any
 20 permit ip host 64.102.48.34 any
```

xml agent

To enable Extensible Markup Language (XML) requests over a dedicated TCP connection, use the **xml agent** command in global configuration 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

Defaults

XML requests are disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

Use the **aaa authorization exec default** command to configure the aaa authorization method for the XML agent.

Task ID

Task ID	Operations
config-services	read, write

Examples

The following example shows how to enable XML requests over a dedicated TCP connection:

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


xml agent corba

**Note**

Effective with Cisco IOS XR Release 3.8.0, the **xml agent corba** command is not available in Cisco IOS XR software.

To enable Extensible Markup Language (XML) Common Object Request Broker Architecture (CORBA) agent services so that you can manage and configure the router using an XML interface, use the **xml agent corba** command in global configuration mode. To disable XML agent services, use the **no** form of this command.

xml agent corba [**ssl**] [**access-group** *name*]

no xml agent corba

Syntax Description

access-group *name* (Optional) Enables access to the XML CORBA services from IP addresses that meet the conditions of the access control list (ACL) specified for the *name* argument.

ssl (Optional) Enables Secure Socket Layer (SSL) CORBA services.

Defaults

The XML agent is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. Support for access groups was added. The access-group keyword and <i>name</i> argument were added to support access groups.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	This command was removed.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

For the **xml agent corba** command to work, at least one interface on the router must be up and running. (Interfaces can be verified by pinging the host.)

SSL-enabled CORBA services can be activated using the **xml agent corba ssl** command. These same services can be deactivated using the **no xml agent corba** command.

Task ID

Task ID	Operations
config-services	read, write

Examples

The following example shows how to enable XML CORBA agent services:

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

Related Commands

Command	Description
ping	Checks host reachability and network connectivity on IP networks.
xml agent corba hostname	Enables the use of a static hostname for XML CORBA agent services.
xml agent tty	Enables XML requests over Secure Shell (SSH) and Telnet.

xml agent corba hostname



Note

Effective with Cisco IOS XR Release 3.8.0, the **xml agent corba hostname** command is not available in Cisco IOS XR software.

To enable the use of static hostname for XML over CORBA, use the **xml agent corba hostname** command in global configuration mode. To disable the static hostname and use the router hostname, use the **no** form of this command.

xml agent corba hostname *string*

no xml agent corba hostname

Syntax Description

<i>string</i>	Name of the static hostname for XML over CORBA.

Defaults

The router hostname is used.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	This command was removed.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

By default, the router hostname is used. To enable the use of static hostname (regardless of configured hostname), use the **xml agent corba hostname** *string* command. The XML agent is restarted only if the effective hostname is changed.

Task ID

Task ID	Operations
config-services	read, write

Examples

The following example shows how to enable a static hostname for XML CORBA agent services. Use the **xml agent corba hostname** *string* command to enable a static hostname, and use the **xml agent corba** command to enable XML CORBA agent services:

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

Related Commands

Command	Description
xml agent corba	Enables XML CORBA agent services.

xml agent tty

To enable Extensible Markup Language (XML) requests over Secure Shell (SSH) and Telnet, use the **xml agent tty** command in global configuration 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 only supported for backward compatibility. To enable the enhanced-performance XML agent, use the **xml agent** command.

xml agent tty

no xml agent tty

Defaults

XML requests over SSH and Telnet are disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following 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 Cisco IOS XR Software

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* module in *Cisco IOS XR System Management Configuration Guide*.

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 NTP configuration mode. 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>	Applies the access control configuration to a specified nondefault VRF. If not specified, the configuration is applied to the default VRF.
ipv4	Specifies an IPv4 access list (default).
ipv6	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. The 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.

Defaults

No NTP access control is configured.

Command Modes

NTP configuration
VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	Support was added for: • vrf keyword and the <i>vrf-name</i> argument • ipv4 keyword • ipv6 keyword

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** keyword and *vrf-name* 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 arguments or keywords.

Defaults No NTP authentication is configured.

Command Modes NTP configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

authenticate (NTP)**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 NTP.
trusted-key	Designates the key or keys to be trusted.

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.

Defaults

No authentication key is defined for NTP.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 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 the key or keys to be trusted.

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 **broadcast** 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.

Defaults

No NTP broadcast servers are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

■ broadcast

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 NTP broadcast packets on an interface.
broadcastdelay	Sets the estimated round-trip delay between the software 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 arguments or keywords.

Defaults

No NTP broadcast clients are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 an NTP broadcast server on a specified NTP interface.
broadcastdelay	Sets the estimated round-trip delay between the software 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 broadcast *microseconds*

Syntax Description

<i>microseconds</i>	Estimated round-trip time (in microseconds) for NTP broadcasts. The range is from 1 to 999999. The default is 3000 microseconds.

Defaults

microseconds: 3000 microseconds

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 NTP configuration mode. 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.

Defaults

No NTP interfaces are configured.

Command Modes

NTP configuration
VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for the vrf keyword and the <i>vrf-name</i> argument.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **interface** (NTP) 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** keyword and *vrf-name* argument to specify a VRF.

By default, NTP is enabled on every interface. To disable NTP on a specific interface, use the **interface** command with the **disable** keyword. To reenable NTP on an interface, use the **no** form of the **interface** command with the **disable** keyword.

Task ID**Task ID****Operations**

ip-services

read, write

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:P2_CRS-8(config)# ntp vrf vrf_10
RP/0/RP0/CPU0:P2_CRS-8(config-ntp-vrf)# interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:P2_CRS-8(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.

Defaults

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 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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. The 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.

Defaults	The default setting for the maximum number of NTP associations is 100.

Command Modes	NTP configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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 NTP 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>	(Optional) IPv4 or IPv6 IP address of the multicast group to join. The default is the IPv4 address 224.0.1.1.

Defaults	The interface is not configured as an NTP multicast client.

Command Modes	NTP interface configuration

Command History	Release	Modification
	Release 3.8.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .
	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	Configures an NTP interface as an NTP multicast server.

multicast

To configure an NTP interface as an NTP multicast server, use the **multicast** 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*] [*version number*] [*ttl ttl*]

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

Syntax Description

destination <i>ip-address</i>	(Optional) The IPv4 or IPv6 multicast group IP address to which to send NTP multicast packets. If you do not specify an IP address, the interface sends packets to the default IPv4 address 224.0.1.1.
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.
version <i>number</i>	(Optional) Specifies the NTP version number.
ttl <i>ttl</i>	(Optional) Specifies the time to live (TTL) of a multicast packet.

Defaults

The interface is not configured as an NTP multicast server.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 global configuration mode.

ntp [**vrf** *vrf-name*]

Syntax Description	vrf <i>vrf-name</i> (Optional) Enters a VRF-specific NTP configuration mode.

Defaults	No defaults behavior or values

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	Support was added for the vrf keyword and the <i>vrf-name</i> argument.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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** keyword and *vrf-name* 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 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.

Defaults

No defaults behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	The * keyword was replaced by the all keyword. Support was added for the vrf keyword and the <i>vrf-name</i> and <i>ip-address</i> arguments.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 EXEC mode.

ntp reset drift

Syntax Description	This command has no keywords or arguments.

Defaults	No defaults behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.8.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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 NTP configuration mode. 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	(Default) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
<i>ip-address</i>	IPv4 or IPv6 IP address or hostname 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>	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.
prefer	(Optional) Makes this peer the preferred peer that provides synchronization.
burst	Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Defaults

No peers are configured by default.

Command Modes

NTP configuration
VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for: • vrf keyword and <i>vrf-name</i> argument • ipv4 keyword • ipv6 keyword • burst keyword • iburst keyword

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **peer** (NTP) 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** keyword and *vrf-name* 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 NTP.
server (NTP)	Allows the system clock to be synchronized by a time server.
source (NTP)	Uses a particular source address in NTP packets.

server (NTP)

To allow the system clock to be synchronized by a time server, use the **server** command in NTP configuration mode. 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	(Default) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
<i>ip-address</i>	IPv4 or IPv6 IP address or hostname 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) 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	Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Defaults

No servers are configured by default.

Command Modes

NTP configuration
 VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for: • vrf keyword and <i>vrf-name</i> argument • ipv4 keyword • ipv6 keyword • burst keyword • iburst keyword

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** keyword and *vrf-name* 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 NTP.
peer (NTP)	Configures the system clock to synchronize a peer or to be synchronized by a peer.
source (NTP)	Uses a particular source address in NTP packets.

show calendar

To display the system time and date, use the **show calendar** command in EXEC mode.

show calendar

Syntax Description This command has no keywords or arguments.

Defaults No defaults behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show calendar** command to display the time and date in Coordinated Universal Time (UTC) format.

Task ID	Task ID	Operations
	basic-services	read

Examples The following is sample output from the **show calendar** command:

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

```
01:29:28 UTC Thu Apr 01 2004
```

 show calendar**Related Commands**

Command	Description
show clock	Displays the clock settings.

show ntp associations

To display the status of Network Time Protocol (NTP) associations, use the **show ntp associations** command in privileged EXEC mode.

show ntp associations [**detail**] [**location** *node-id* | **all**]

Syntax Description	detail	(Optional) Displays detailed information about each NTP association.
	location <i>node-id</i>	(Optional) Displays the status of NTP associations from the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	all	(Optional) Displays the status of NTP associations from all nodes.

Defaults	No defaults behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	The output was modified to display nondefault VRF instances and to accommodate IPv6 addresses. Support was added for the all keyword.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Output for the **show ntp associations** command is displayed only if NTP is configured on the router.

Task ID	Task ID	Operations
	ip-services	read

Examples

The following is sample output from the **show ntp associations** command:

```
RP/0/RP0/CPU0:router# show ntp associations
```

```
Wed Jul 30 04:03:13.471 PST DST
```

```

      address      ref clock      st  when  poll  reach  delay  offset  disp
~172.19.69.1      172.24.114.33    3   25    64    3     2.89  57550122 39377
~2001:db8::feed   .INIT.            16   -     64    0     0.00   0.000   15937
~2001:db8::beef vrf vrf_1
                  .INIT.            16   -     64    0     0.00   0.000   16000
* sys_peer, # selected, + candidate, - outlier, x falseticker, ~ configured

```

Table 48 describes the significant fields shown in the display.

Table 48 *show ntp associations Field Descriptions*

Field	Description
*	The peer has been declared the system peer and lends its variables to the system variables.
#	The peer is a survivor, but not among the first six peers sorted by synchronization distance. If the association is ephemeral, it may be demobilized to conserve resources.
+	The peer is a survivor and a candidate for the combining algorithm.
-	The peer is discarded by the clustering algorithm as an outlier.
x	The peer is discarded by the intersection algorithm as a falseticker.
~	Indicates peer is statically configured.
address	IPv4 or IPv6 address of the peer. If a nondefault VRF is configured for the peer, the VRF follows the address.
ref clock	Reference clock type or address for the peer.
st	Stratum setting for the peer.
when	Time, in milliseconds, since last NTP packet was received from peer.
poll	Polling interval (seconds).
reach	Peer reachability (bit string, in octal).
delay	Round-trip delay to peer, in milliseconds.
offset	Relative time difference between a peer clock and a local clock, in milliseconds.
disp	Dispersion.

The following is sample output from the **show ntp associations detail** command:

```
RP/0/RP0/CPU0:router# show ntp associations detail

172.19.69.1 configured, our_master, sane, valid, stratum 2
ref ID 171.68.10.150, time C4143AAE.00FCF396 (18:27:58.003 UTC Tue Mar 30 2004)
our mode client, peer mode server, our poll intvl 64, peer poll intvl 64
root delay 5.23 msec, root disp 4.07, reach 3, sync dist 0.0077
delay 1.9829 msec, offset -3.7899 msec, dispersion 0.0358
precision 2**18, version 4
org time C4143B8D.7EBD5FEF (18:31:41.495 UTC Tue Mar 30 2004)
rcv time C4143B8D.801DFA44 (18:31:41.500 UTC Tue Mar 30 2004)
xmt time C4143B8D.7F595E44 (18:31:41.497 UTC Tue Mar 30 2004)
filtdelay =      2.99      1.98      1.98      1.99      1.99      1.99      2.98      1.98
filtoffset =    -3.89    -3.74    -3.78    -3.81    -3.76    -3.73    -4.08    -3.64
filtererror =      0.00      0.02      0.03      0.05      0.06      0.08      0.09      0.32

2001:0DB8::FEED vrf xxx configured, candidate, sane, valid, stratum 2
ref ID 64.103.34.14, time CB0C8C66.38285D84 (14:00:22.219 JST Fri Dec 14 2007)
our mode client, peer mode server, our poll intvl 64, peer poll intvl 64
root delay 181.17 msec, root disp 3.19, reach 377, sync dist 0.1463
delay 104.9158 msec, offset -15.4552 msec, dispersion 0.0439
precision 2**16, version 4
org time CB0C8D0A.70282853 (14:03:06.438 JST Fri Dec 14 2007)
rcv time CB0C8D0A.81CA0E2B (14:03:06.506 JST Fri Dec 14 2007)
xmt time CB0C8D0A.66AAB677 (14:03:06.401 JST Fri Dec 14 2007)
filtdelay =   105.90   104.92   104.91   104.91   105.90   105.85   105.90   104.91
filtoffset =  -15.92  -15.67  -15.54  -15.59  -15.58  -15.54  -15.41  -14.36
filtererror =      0.02      0.03      0.05      0.06      0.08      0.09      0.11      1.05

2001:0DB8::BEEF vrf yyy configured, our_master, sane, valid, stratum 2
ref ID 64.104.193.12, time CB0C8CC1.2C14CED1 (14:01:53.172 JST Fri Dec 14 2007)
our mode client, peer mode server, our poll intvl 64, peer poll intvl 64
root delay 160.83 msec, root disp 4.35, reach 377, sync dist 0.1372
delay 104.9302 msec, offset -14.6327 msec, dispersion 0.0183
precision 2**18, version 4
org time CB0C8CCB.684619D8 (14:02:03.407 JST Fri Dec 14 2007)
rcv time CB0C8CCB.79782B09 (14:02:03.474 JST Fri Dec 14 2007)
xmt time CB0C8CCB.5E9A5429 (14:02:03.369 JST Fri Dec 14 2007)
filtdelay =   104.93   104.93   104.93   104.93   104.93   104.93   104.93   104.93
filtoffset =  -14.71  -14.53  -14.78  -14.73  -14.70  -14.52  -14.59  -14.50
filtererror =      0.00      0.02      0.03      0.05      0.06      0.08      0.09      0.11
```

Table 49 describes the significant fields shown in the display.

Table 49 *show ntp associations detail Field Descriptions*

Field	Descriptions
vrf	Nondefault VRF, if specified for this peer.
configured	Statically configured peer.
dynamic	Dynamically discovered peer.
our_master	Synchronization of the local machine to this peer.
sane	Passing of basic sanity checks by this peer.
ref ID	Address of machine to which the peer is synchronized.
time	Last time stamp that the peer received from its master.
our mode	Mode relative to peer (active/passive/client/server/bdcast/bdcast client).
peer mode	Mode of peer relative.

Table 49 *show ntp associations detail Field Descriptions (continued)*

Field	Descriptions
our poll intvl	Poll interval to peer.
peer poll intvl	Poll interval of interval.
root delay	Delay along path to root (ultimate stratum 1 time source).
root disp	Dispersion of path to root.
reach	Peer reachability (bit string in octal).
sync dist	Peer synchronization distance.
delay	Round-trip delay to peer.
offset	Offset of peer clock relative to this clock.
dispersion	Dispersion of peer clock.
precision	Precision of peer clock in (Hertz) Hz.
version	NTP version number that peer is using.
org time	Originate time stamp.
rcv time	Receive time stamp.
xmt time	Transmit time stamp.
filtdelay	Round-trip delay in milliseconds of each sample.
filtoffset	Clock offset in milliseconds of each sample.
filtererror	Approximate error of each sample.

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 EXEC mode.

show ntp status [**location** *node-id*] **all**

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/module</i> notation.
	all	(Optional) Displays the status of NTP from all nodes.

Defaults	No defaults behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	The loopfilter state, drift, system poll interval, and last update display fields were added to the output. Support was added for the all keyword.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	ip-services	read

Examples

The following is 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 50](#) describes the significant fields shown in the display.

Table 50 *show ntp status Field Descriptions*

Field	Description
synchronized	Synchronized system to an NTP peer.
stratum	NTP stratum of the local system.
reference	IPv4 address or first 32 bits of the MD5 hash of the IPv6 address of the peer to which clock is synchronized.
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 (in milliseconds) to synchronized peer.
root delay	Total delay (in milliseconds) along path to root clock.
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 local system.
last update	Time the router last updated its NTP information.

Related Commands

Command	Description
show ntp associations	Displays the status of NTP associations.

source (NTP)

To use a particular source address in Network Time Protocol (NTP) packets, use the **source** command in NTP configuration mode. 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.

Defaults

The source address is determined by the outgoing interface.

Command Modes

NTP configuration
VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for the vrf keyword and the <i>vrf-name</i> argument.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** keyword and *vrf-name* 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

The following 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.

Defaults

No NTP trusted key is designated.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 NTP authentication.
authentication-key (NTP)	Defines an authentication key for NTP.

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 arguments or keywords.

Defaults This command is disabled.

Command Modes NTP configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The Cisco CRS-1 router and the Cisco XR 12000 Series Router each have 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 **ntp update calendar** command, NTP updates the calendar with the software clock every hour.

update-calendar**Task ID****Task ID Operations**

ip-services	read, write

Examples

The following 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	Copies the hardware (calendar) clock settings into the software clock.

clock update-calendar	Sets the calendar from the software clock.



Object Tracking Commands in Cisco IOS XR Software

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 *Cisco IOS XR System Management Configuration Guide*.

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 the 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 seconds	Sets delay of from 1 to 10 seconds before communication of up status of the tracked object or list of objects.
delay down seconds	Sets delay of from 1 to 10 seconds before communication of down status of the tracked object or list of objects.

Defaults

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **delay** command can be used in conjunction with all track types:

- [type line-protocol state](#)
- [type list boolean](#)
- [type route reachability](#)

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

Related Commands

Command	Description
delay	Clears entry of a delay, in seconds, before the track or interface state should be polled for a change in status.
track	Initiates or identifies a tracking process to track the status of an object; also enters track configuration mode.

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.	

Defaults

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

To access this **interface** command, you must be in line protocol tracking configuration mode.

For information about interface keywords, see *Cisco IOS XR Interface and Hardware Component Command Reference*.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

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

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

Related Commands

Command	Description
track	Initiates or identifies a tracking process to track the status of an object; also enters track configuration mode.
type line-protocol state	Configures tracking based on the line protocol state of an interface object.
type list boolean	Configures tracking of a list of objects based on a Boolean calculation.
type route reachability	Configures tracking based on whether or not a route is part of a particular routing table.

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.

Defaults

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

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

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# track PREFIX1
RRP/0/0/CPU0:router(config-track)# type route reachability
RP/0/0/CPU0:router(config-track-route)# route ipv4 7.0.0.0/24
RP/0/0/CPU0:router(config-track-route)# interface service-ipsec 1
RP/0/0/CPU0:router(config-if)# vrf 1
RP/0/0/CPU0:router(config-if)# ipv4 address 70.0.0.2 255.255.255.0
RP/0/0/CPU0:router(config-if)# line-protocol track PREFIX1
```

Related Commands

Command	Description
interface (track)	Indicates an interface object type for tracking purposes.
track	Initiates a tracking process to track the status of an object or list of objects; enters track configuration mode.

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.

Defaults

No default behavior or values

Command Modes

List tracking configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 only be used 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/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# track connection100
RP/0/0/CPU0:router(config-track-list)# type list boolean and
RP/0/0/CPU0:router(config-track-list)# object obj3 not
```

Related Commands

Command	Description
track	Initiates or identifies a tracking process to track the status of an object; also enters track configuration mode.
type list boolean	Configures tracking of a 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 [*IP prefix and subnet mask*]

Syntax Description

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

Defaults

No default behavior or values

Command Modes

Route tracking configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# track track22
RP/0/0/CPU0:router(config-track)# type route reachability
RP/0/0/CPU0:router(config-track-route)# route ipv4 10.56.8.10/16
```

Related Commands

Command	Description
type route reachability	Configures tracking based on whether or not a route is part of a particular routing table.
vrf (track)	Configures that a VRF table should 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* | **brief** | **interface** | **ipv4 route**]

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.

Defaults

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/0/0/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 to track the status of an object; also enters track configuration mode.

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.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The **track** command is used in conjunction with all the following track commands and types:

- [delay](#)
- [show track](#)
- [type line-protocol state](#)
- [type list boolean](#)
- [type route reachability](#)

Task ID

Task ID	Operations
sysmgr	read, write

Examples

The following 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/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# track LIST2
RP/0/0/CPU0:router# track LIST2 delay up 5
```

Related Commands

Command	Description
delay	Configures the duration, 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.
type line-protocol state	Configures tracking based on the line protocol state of an interface object.
type list boolean	Configures tracking based on whether or not a route is part of a particular routing table.
type route reachability	Configures tracking based on whether or not a route is part of a particular routing table.

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

Defaults

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following example shows how to use the **type line-protocol state** command:

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


Related Commands

Command	Description
delay	Configures the duration, in seconds, before the track or interface state should be polled for a change in status.
interface (track)	Indicates an interface object type for tracking purposes.
show track	Displays information about objects that were tracked.
track	Initiates or identifies a tracking process to track the status of an object; also enters global configuration mode.

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.

Defaults

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

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

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

Related Commands

Command	Description
delay	Configures the duration, 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 to be tracked.
show track	Displays information about objects that were tracked.
track	Initiates or identifies a tracking process to track the status of an object; also enters global configuration mode.
type line-protocol state	Configures tracking based on the line protocol state of an interface object.
type route reachability	Configures tracking based on whether or not a route is part of a particular routing table.

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 arguments or keywords.

Defaults	No default behavior or values

Command Modes	Track configuration

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following example shows how to track for route reachability:

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

Related Commands

Command	Description
delay	Configures the duration, 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.
track	Initiates or identifies a tracking process to track the status of an object; also enters global configuration mode.

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** form of the command.

vrf {vrf-table-name}

no vrf [vrf-table-name]

Syntax Description	<i>vrf-name</i> Network and subnet; for example, 10.56.8.10/16.									
Defaults	No default behavior or values									
Command Modes	Route tracking configuration									
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>Release 3.6.0</td><td>This command was introduced on the Cisco XR 12000 Series Router.</td></tr><tr><td>Release 3.7.0</td><td>No modification.</td></tr><tr><td>Release 3.8.0</td><td>No modification.</td></tr></table>		Release	Modification	Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.	Release 3.7.0	No modification.	Release 3.8.0	No modification.
Release	Modification									
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.									
Release 3.7.0	No modification.									
Release 3.8.0	No modification.									
Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.									
Task ID	<table><tr><th>Task ID</th><th>Operations</th></tr><tr><td>sysmgr</td><td>read, write</td></tr></table>		Task ID	Operations	sysmgr	read, write				
Task ID	Operations									
sysmgr	read, write									
Examples	The following example displays the use of the vrf command: <pre>RP/0/0/CPU0:router# configure RP/0/0/CPU0:router(config)# track track22 RP/0/0/CPU0:router(config-track)# type route reachability RP/0/0/CPU0:router(config-track-route)# vrf vrf1</pre>									
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>delay</td><td>Clears entry of a VRF table as the basis to track route reachability.</td></tr></table>		Command	Description	delay	Clears entry of a VRF table as the basis to track route reachability.				
Command	Description									
delay	Clears entry of a VRF table as the basis to track route reachability.									

Command	Description
route ipv4	Configures an IP prefix and subnet as the basis to track route reachability.
type route reachability	Configures tracking based on whether or not a route is part of a particular routing table.



Process and Memory Management Commands on Cisco IOS XR Software

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 *Cisco IOS XR Getting Started Guide*.

affinity location-set

To set the affinity of a placeable program (process) to or from a group of nodes, use the **affinity location-set** command in placement program configuration mode. To remove the affinity location set, use the **no** form of this command.

affinity location-set *node-id1* [...*[node-id5]*] {**attract** *strength* | **repulse** *strength* | **default** | **none**}

no affinity location-set *node-id1* [...*[node-id5]*] {**attract** *strength* | **repulse** *strength* | **default** | **none**}

Syntax Description

[... <i>[node-id5]</i>]	The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation. To specify multiple nodes, enter the <i>node-id</i> for each node. You can specify a node pair, or up to 5 nodes.
attract	Specifies a positive affinity.
repulse	Specifies a negative affinity.
<i>strength</i>	A positive or negative strength. The range is from 1 to 100000 points.
default	Sets the affinity location-set default value, which is equivalent to specifying an attract <i>strength</i> of 200.
none	Sets the affinity value to zero points.

Defaults

There are no default location-set affinities for any placeable processes. Specifying an affinity value of **default** is equivalent to specifying the **attract** *strength* argument to be 200.

Command Modes

Placement program configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **affinity location-set** command assigns an affinity for a process to run on a specific node, node pair or set of up to 5 nodes.

A node pair is either an active and standby pair of nodes [hosted on route processors (RPs) or distributed RPs], or a single active node on an RP or DRP that does not have a standby.

By containing references to specific location identifiers, location-set affinities are more specific to the individual SDR in which they are used than other affinity types.

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

The following example shows how to configure placement affinity for the OSPF process class on the node pair:

```
RP/0/RP0/CPU0:router(config)# placement program ospf
RP/0/RP0/CPU0:router(config-place)# affinity location-set 0/1/cpu0 0/1/cpu1 attract 200
```

The following example shows how to stop loading a DRP with more processes:

```
RP/0/RP0/CPU0:router(config)# placement program default
RP/0/RP0/CPU0:router(config-place)# affinity location-set 0/1/cpu0 repulse 90
```

Related Commands	Command	Description
	placement program	Enters placement program configuration mode to set process affinities (preferences).

affinity location-type

To set the affinity of a placeable program (process) to or from a location type, use the **affinity location-set** command in placement program configuration mode. To remove the affinity of a location set, use the **no** form of this command.

affinity location-type { **current** | **paired** | **primary** } { **attract** *strength* | **repulse** *strength* | **default** | **none** }

no affinity location-type { **current** | **paired** | **primary** } { **attract** *strength* | **repulse** *strength* | **default** | **none** }

Syntax Description

current	Affinity for the current location.
paired	Affinity for a node (or route processor) with a standby node.
primary	Affinity for the primary node.
attract	Specifies a positive affinity.
repulse	Specifies a negative affinity.
<i>strength</i>	A positive or negative strength. The range is from 1 to 100000 points.
default	Sets the affinity location-type default values.
none	Sets the affinity value to zero points.

Defaults

By default, all processes have the following settings:

- **location-type current attract** *strength* argument: 100
- **location-type paired attract** *strength* argument: 60
- **location-type primary attract** *strength* argument: 40

Specifying an affinity value of **default** is equivalent to specifying the **attract** *strength* argument to be 200.

Command Modes

Placement program configuration

Command History

Release	Modification
Release 3.2.50	This command was introduced on the Cisco CRS-1.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **affinity location-type** command is used to place a process at a particular location. The default policy is that the location type be a node pair (active and standby nodes), and that the process does not move automatically (**current** = 100) unless a solo node fails and the process must be started on a different node.

You can configure the placement policy to allow certain processes to stay where they are (**current**) or move just by indicating so through the various affinity choices. The higher the positive value of an affinity, the stronger the requirement that the process run at a location, and so on. A low or zero point value would indicate a weaker requirement (or no preference) that a process run at a location.

The affinity location type with the **paired** option configures the affinity towards the nodes that are paired (active and standby nodes), and as mentioned earlier, this is the default policy. The affinity location type using the **primary** option configures the affinity towards the designated secure domain router system controller (DSDRSC) node.



Note

Change the **current** affinity with assistance from Cisco support personnel.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

This example shows how to place Border Gateway Protocol (BGP) in a specific location by setting it with a high attract value. The result is that BGP does not move location under any circumstances other than a node pair removal.

```
RP/0/RP0/CPU0:router(config)# placement program bgp
RP/0/RP0/CPU0:router(config-place)# affinity location-type current attract 5000
```

Related Commands

Command	Description
placement program	Enters placement program configuration mode to set process affinities (preferences).

affinity program

To set the affinity of a placeable program (process) to or from another program, use the **affinity program** command in placement program configuration mode. To remove the affinity of a program, use the **no** form of this command.

affinity program *program* {**attract** *strength* | **repulse** *strength* | **default** | **none**}

no affinity program *program* {**attract** *strength* | **repulse** *strength* | **default** | **none**}

Syntax Description

<i>program</i>	Name of specific a program or program group.
attract	Specifies a positive affinity.
repulse	Specifies a negative affinity.
<i>strength</i>	A positive or negative strength. The range is from 1 to 100000.
default	Sets the affinity value to the default.
none	Sets the affinity value to zero.

Defaults

Specifying an affinity value of **default** is equivalent to specifying the **attract** *strength* argument to be 200.

Command Modes

Placement program configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **affinity program** command is used to collocate processes or keep them apart. You would want to use this command because you have learned that certain processes perform better when they are running together on the same node (**attract**)—or on different nodes, apart from each other (**repulse**).

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

The following example shows how to keep IPv4 and IPv6 Routing Information Bases (RIBs) apart:

```
RP/0/RP0/CPU0:router(config)# placement program ipv4_rib
RP/0/RP0/CPU0:router(config-place)# affinity program ipv6_rib repulse 200
```

Related Commands

Command	Description
placement program	Enters placement program configuration mode to set process affinities (preferences).

affinity self

To set the affinity of a placeable program (process) to or from one of its own instances, use the **affinity self** command in placement program configuration mode. To remove the affinity self setting, use the **no** form of this command.

affinity self { **attract** *strength* | **repulse** *strength* | **default** | **none** }

no affinity self { **attract** *strength* | **repulse** *strength* | **default** | **none** }

Syntax Description

attract	Specifies a positive affinity.
repulse	Specifies a negative affinity.
<i>strength</i>	A positive or negative strength. The range is from 1 to 100000 points.
default	Sets the affinity value to the default.
none	Sets the affinity value to zero points.

Defaults

The affinity self default is initially set in system placement files.

Command Modes

Placement program configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **affinity self** command is used to adjust placement decisions when multiple instances of a process are started. An attract (positive) affinity indicates a preference to have all instances of a process run on the same node, while a repulse (negative) affinity indicates a preference to have each instance of a process run on different nodes.

Typically, you would want to monitor how a process on your system best performs, and whether instances of the same class should be colocated or not.

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

The following example shows how to configure BGP speakers to run on different nodes:

```
RP/0/RP0/CPU0:router(config)# placement program bgp
RP/0/RP0/CPU0:router(config-place)# affinity self repulse 200
```

Related Commands

Command	Description
placement program	Enters placement program configuration mode to set process affinities (preferences).

clear context

To clear core dump context information, use the **clear context** command in administration EXEC mode or in EXEC mode.

clear context location {*node-id* | **all**}

Syntax Description

location <i>node-id</i>	(Optional) Clears core dump context information for a specified node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
location all	(Optional) Clears core dump context information for all nodes.

Defaults

No default behavior or values

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

Defaults

No default behavior or values

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

On 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. Because 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
```

■ dumpcore

```

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/CPU0:Oakland#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/libbst16550.dll 0xfc2bc000 0x00008ed4 0xfc2ba470 0x00000430 0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO : /pkg/lib/libconaux.dll
0xfc2c5000 0x00001dc0 0xfc2ba8a0 0x000001a8 0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/lib_conaux_error.dll 0xfc1ee114 0x00000e78 0xfc295f64 0x00000088 0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttyutil.dll 0xfc2c7000 0x00003078 0xfc2baa48 0x00000168 0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO : /pkg/lib/libbag.dll
0xfc431000 0x0000ee98 0xfc40cc94 0x00000368 0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO : /pkg/lib/libchkpt.dll
0xfc474000 0x0002ecf8 0xfc4a3000 0x00000950 0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libsysdbbackend.dll 0xfc8ed000 0x0000997c 0xfc8d3aa8 0x0000028c 0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttymgmtconnection.dll 0xfce85000 0x00004208 0xfce8a000 0x00000468 0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttymgmt.dll 0xfcea4000 0x0000e944 0xfce8abf0 0x000003c8 0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
/pkg/lib/libttynmspc.dll 0xfcec7000 0x00004a70 0xfcec6644 0x000002c8 0
RP/0/RP0/CPU0Sep 22 01:40:28.396 : dumper[54]: %DUMPER-5-CORE_FILE_NAME : Core for process
pkg/bin/devc-conaux at
harddisk:/coredump/devc-conaux.by.dumper_gen.sparse.20040922-014027.node0_RP0_CPU0.ppc.Z
RP/0/RP0/CPU0Sep 22 01:40:32.309 : dumper[54]: %DUMPER-5-DUMP_SUCCESS : Core dump success

```

exception filepath

To modify core dump settings, use the **exception filepath** command in administration configuration mode or in global configuration mode. To remove the configuration, use the **no** form of this command.

exception [**choice** *preference*] [**compress** {**on** | **off**}] [**filename** *filename lower-limit-higher-limit*]
filepath *filepath*

no exception [**choice** *preference*] [**compress** {**on** | **off**}] [**filename** *filename lower-limit-higher-limit*] [**filepath** *filepath*]

Syntax Description	
choice <i>preference</i>	(Optional) Configures the order of preference for the destination of core dump files. Up to the three destinations can be defined. Valid values are 1 to 3.
compress { on off }	(Optional) Specifies whether or not the core dump file should be sent compressed. By default, core dump files are sent compressed. If you specify the compress keyword, you must specify one of the following required keywords: on—Compresses the core dump file before sending it. off—Does not compress the core dump file before sending it.
filename <i>filename lower-limit-higher-limit</i>	(Optional) Specifies the filename to be appended to core dump files and the lower and higher limit range of core dump files to be sent to a specified destination before being recycled by the circular buffer. See Table 51 in the “Usage Guidelines” section for a description of the default core dump file naming convention. Valid values for the <i>lower-limit</i> argument are 0 to 4. Valid values for the <i>higher-limit</i> argument are 5 to 64. A hyphen (-) must immediately follow the <i>lower-limit</i> argument. Note To uniquely identify each core dump file, a value is appended to each core dump file, beginning with the lower limit value configured for the <i>lower-limit</i> argument and continuing until the higher limit value configured for the <i>higher-limit</i> argument has been reached. After the higher limit value has been reached, the Cisco IOS XR software begins to recycle the values appended to core dump files, beginning with the lower limit value.
filepath	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.

Defaults

If you do not specify the order of preference for the destination of core dump files using the **choice** keyword and *preference* argument, the default preference is the primary location (that is, **choice 1**). Core dump files are sent compressed.

The default filenames convention used for core dump files is described in the “Usage Guidelines” section. See [Table 51](#).

Command Modes

Administration configuration
Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

**Note**

We recommend that you specify a location on the hard disk as the primary location on the Cisco CRS-1 router.

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 on the Cisco CRS-1 are:

- `harddisk:/dumper`
- `disk1:/dumper`
- `disk0:/dumper`

The default fallback destinations on Cisco XR 12000 Series Routers are:

- `disk1:/dumper`
- `disk0:/dumper`
- `bootflash:/dumper`


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

The 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, the 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 51](#) describes the default core dump filenaming convention.

Table 51 **Default Core Dump Filenaming Convention Description**

Field	Description
<i>process</i>	Name of the process that generated the core dump.
<i>.by.requester .abort</i>	If the core dump was generated because of a request by a process (requester), the core filename contains the string “ <i>.by.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 “ <i>.abort</i> ” instead of the name of the requester.
<i>.sparse</i>	If a sparse core dump was generated instead of a full core dump, “ <i>.sparse</i> ” appears in the core dump filename.
<i>.date-time</i>	Date and time the dumper process was called by the process manager to generate the core dump. The <i>.date-time</i> 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.

Table 51 **Default Core Dump Filenaming Convention Description (continued)**

Field	Description
<i>.node</i>	Node ID, expressed in the <i>rack/slot/module</i> notation, where the process that generated the core dump was running.
<i>.processor-type</i>	Type of processor (mips or ppc).
<i>.Z</i>	If the core dump was sent compressed, the filename contains the <i>.Z</i> suffix.

You can modify the default naming convention by specifying a filename to be appended to core dump files with the optional **filename** keyword and *filename* 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* keyword has been reached. When the configured higher-limit value has been reached, the 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 configure the core dump setting for the primary user-defined preferred location. In this example, core files are configured to be sent uncompressed; the filename of core dump files is set to “core” (that is, all core filenames will be named core); the range value is set from 0 to 5 (that is, the values 0 to 5 are appended to the filename for the first five generated core dump files, respectively, before being recycled); and the destination is set to a directory on the hard disk.

```
RP/0/RP0/CPU0:router(config)# exception choice 1 compress off filename core 0-5 filepath
/harddisk:/corefile
```

Related Commands

Command	Description
exception pakmem	Collects packet memory information in core dumps.
exception sparse	Enables or disables sparse core dumps.
exception sprsize	Sets the maximum size of core dump files.
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.

Defaults

Packet memory information is not included in core dump files.

Command Modes

Administration configuration
Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **exception pakmem on** command 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.

■ exception pakmem

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	Sets the maximum size of core dump files.
	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

Defaults

Sparse core dumps are disabled.

Command Modes

Administration configuration
Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **exception sparse** command to reduce the amount of data generated in the core dump file. Sparse core dumps, thus, 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.

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	Collects packet memory information in core dumps.
exception sprsize	Sets the maximum file size of core dump files.
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).

Defaults

megabytes: 192 MB

Command Modes

Administration configuration
Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** 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.

exception sprsize

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** command in EXEC mode.

follow {**job** *job-id* | **process** *pid* | **location** *node-id*} [**all**] [**blocked**] [**debug** *level*] [**delay** *seconds*] [**dump** *address size*] [**iteration** *count*] [**priority** *level*] [**stackonly**] [**thread** *tid*] [**verbose**]

Syntax Description		
job <i>job-id</i>		Follows a process by job ID.
process <i>pid</i>		Follows the process with the process ID (PID) specified for the <i>pid</i> argument.
location <i>node-id</i>		(Optional) Follows the target process on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
all		(Optional) Follows all threads.
blocked		(Optional) Follows the chain of thread IDs (TIDs) or PIDs that are blocking the target process.
debug <i>level</i>		(Optional) Sets the debug level for the following operation. Valid values for the <i>level</i> argument are 0 to 10.
delay <i>seconds</i>		(Optional) Sets the delay interval between each iteration. Valid values for the <i>seconds</i> argument are 0 to 255 seconds.
dump <i>address size</i>		(Optional) Dumps the memory segment starting with the specified memory address and size specified for the <i>address</i> and <i>size</i> arguments.
iteration <i>count</i>		(Optional) Specifies the number of times to display information. Valid values for the <i>count</i> argument are 0 to 255 iterations.
priority <i>level</i>		(Optional) Sets the priority level for the following operation. Valid values for the <i>level</i> argument are 1 to 63.
stackonly		(Optional) Displays only stack trace information.
thread <i>tid</i>		(Optional) Follows the TID of a process or job ID specified for the <i>tid</i> argument.
verbose		(Optional) Displays register and status information pertaining to the target process.

Defaults

Entering the **follow** command without any optional keywords or arguments performs the operation for five iterations from the local node with a delay of 5 seconds between each iteration. The output includes information about all live threads. This command uses the default scheduling priority from where the command is being run.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.
- Follow a process in a loop for a given number of iterations.
- Set a delay between two iterations while invoking the command.
- Set the priority at which this process should run while this command is being run.
- Dump memory from a given virtual memory location for a given size.
- 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

The following example shows how to use the **follow** command to debug the process associated with job ID 257 for one iteration:

```
RP/0/RP0/CPU0:router# follow job 257 iteration 1
```

```
Attaching to process pid = 28703 (pkg/bin/packet)
No tid specified, following all threads
```

```
DLL Loaded by this process
```

```
-----
```

DLL path	Text addr.	Text size	Data addr.	Data size	Version
/pkg/lib/libovl.dll	0xfc0c9000	0x0000c398	0xfc0c31f0	0x0000076c	0
/pkg/lib/libplatform.dll	0xfc0d6000	0x0000aa88	0xfc0e1000	0x00002000	0
/pkg/lib/libsysmgr.dll	0xfc0e3000	0x0000aeac	0xfc0c395c	0x00000388	0
/pkg/lib/libinfra.dll	0xfc0ee000	0x000332ec	0xfc122000	0x00000c70	0
/pkg/lib/libios.dll	0xfc123000	0x0002c4bc	0xfc150000	0x00002000	0
/pkg/lib/libc.dll	0xfc152000	0x00077ae0	0xfc1ca000	0x00002000	0
/pkg/lib/libsyslog.dll	0xfc1d4000	0x0000530c	0xfc122c70	0x00000308	0
/pkg/lib/libbackplane.dll	0xfc1da000	0x0000134c	0xfc0c3e6c	0x000000a8	0
/pkg/lib/libnodeid.dll	0xfc1e7000	0x000091fc	0xfc1e61a8	0x00000208	0
/pkg/lib/libdebug.dll	0xfc23e000	0x0000ef64	0xfc1e6680	0x00000550	0
/pkg/lib/lib_procfs_util.dll	0xfc24d000	0x00004e2c	0xfc1e6bd0	0x000002a8	0
/pkg/lib/libsysdb.dll	0xfc252000	0x00046224	0xfc299000	0x0000079c	0
/pkg/lib/libsysdbutils.dll	0xfc29a000	0x0000ae04	0xfc29979c	0x000003ec	0
/pkg/lib/libwd_evm.dll	0xfc2a9000	0x0000481c	0xfc299b88	0x00000188	0
/pkg/lib/lib_mutex_monitor.dll	0xfc35e000	0x00002414	0xfc340850	0x00000128	0
/pkg/lib/libchkpt.dll	0xfc477000	0x0002ee04	0xfc474388	0x00000950	0
/pkg/lib/libpacket_common.dll	0xfc617000	0x000130f0	0xfc6056a0	0x000007b0	0

Iteration 1 of 1

Current process = "pkg/bin/packet", PID = 28703 TID = 1

```

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x48204410 [<N/A>]

```

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 2

```

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0xfc48d848 [chk_evm_thread]

```

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 3

```

trace_back: #0 0xfc17d54c [SignalWaitinfo]
trace_back: #1 0xfc161c64 [sigwaitinfo]
trace_back: #2 0xfc10302c [event_signal_thread]

```

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 4

```

trace_back: #0 0xfc1106c4 [MsgReceivePulse]
trace_back: #1 0xfc0fc604 [msg_receive_async]
trace_back: #2 0xfc0ffa70 [event_dispatch]
trace_back: #3 0xfc0ffc5c [event_block_async]
trace_back: #4 0xfc35e36c [receive_events]

```

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 5

follow

```

trace_back: #0 0xfc17d564 [SignalWaitinfo_r]
trace_back: #1 0xfc161c28 [sigwait]
trace_back: #2 0x48203928 [<N/A>]

```

```
ENDOFSTACKTRACE
```

The following example shows how to use the **follow** command to debug TID 5 of the process associated with job ID 257 for one iteration:

```
RP/0/RP0/CPU0:router# follow job 257 iteration 1 thread 5
```

```
Attaching to process pid = 28703 (pkg/bin/packet)
```

```
DLL Loaded by this process
```

```
-----
```

DLL path	Text addr.	Text size	Data addr.	Data size	Version	
/pkg/lib/libovl.dll	0xfc0c9000	0x0000c398	0xfc0c31f0	0x0000076c		0
/pkg/lib/libplatform.dll	0xfc0d6000	0x0000aa88	0xfc0e1000	0x00002000		0
/pkg/lib/libsysmgr.dll	0xfc0e3000	0x0000aeac	0xfc0c395c	0x00000388		0
/pkg/lib/libinfra.dll	0xfc0ee000	0x000332ec	0xfc122000	0x00000c70		0
/pkg/lib/libbios.dll	0xfc123000	0x0002c4bc	0xfc150000	0x00002000		0
/pkg/lib/libc.dll	0xfc152000	0x00077ae0	0xfc1ca000	0x00002000		0
/pkg/lib/libsyslog.dll	0xfc1d4000	0x0000530c	0xfc122c70	0x00000308		0
/pkg/lib/libbackplane.dll	0xfc1da000	0x0000134c	0xfc0c3e6c	0x000000a8		0
/pkg/lib/libnodeid.dll	0xfc1e7000	0x000091fc	0xfc1e61a8	0x00000208		0
/pkg/lib/libdebug.dll	0xfc23e000	0x0000ef64	0xfc1e6680	0x00000550		0
/pkg/lib/lib_procfs_util.dll	0xfc24d000	0x00004e2c	0xfc1e6bd0	0x000002a8		0
/pkg/lib/libsysdb.dll	0xfc252000	0x00046224	0xfc299000	0x0000079c		0
/pkg/lib/libsysdbutils.dll	0xfc29a000	0x0000ae04	0xfc29979c	0x000003ec		0
/pkg/lib/libwd_evmm.dll	0xfc2a9000	0x0000481c	0xfc299b88	0x00000188		0
/pkg/lib/lib_mutex_monitor.dll	0xfc35e000	0x00002414	0xfc340850	0x00000128		0
/pkg/lib/libchkpt.dll	0xfc477000	0x0002ee04	0xfc474388	0x00000950		0
/pkg/lib/libpacket_common.dll	0xfc617000	0x000130f0	0xfc6056a0	0x000007b0		0

```
Iteration 1 of 1
```

```
-----
```

```
Current process = "pkg/bin/packet", PID = 28703 TID = 5
```

```

trace_back: #0 0xfc17d564 [SignalWaitinfo_r]
trace_back: #1 0xfc161c28 [sigwait]
trace_back: #2 0x48203928 [<N/A>]

```

```
ENDOFSTACKTRACE
```

The following example shows how to use the **follow** command to debug the chain of threads blocking thread 2 associated with the process assigned PID 139406:

```
RP/0/RP0/CPU0:router# follow process 139406 blocked iteration 1 thread 2
```

```
Attaching to process pid = 139406 (pkg/bin/lpts_fm)
```

```
DLL Loaded by this process
```

```
-----
```

DLL path	Text addr.	Text size	Data addr.	Data size	Version	
/pkg/lib/libplatform.dll	0xfc0d6000	0x0000aa88	0xfc0e1000	0x00002000		0
/pkg/lib/libsysmgr.dll	0xfc0e3000	0x0000aeac	0xfc0c395c	0x00000388		0
/pkg/lib/libinfra.dll	0xfc0ee000	0x000332ec	0xfc122000	0x00000c70		0
/pkg/lib/libbios.dll	0xfc123000	0x0002c4bc	0xfc150000	0x00002000		0
/pkg/lib/libc.dll	0xfc152000	0x00077ae0	0xfc1ca000	0x00002000		0
/pkg/lib/libltrace.dll	0xfc1cc000	0x00007f5c	0xfc0c3ce4	0x00000188		0

```

/pkg/lib/libsyslog.dll 0xfc1d4000 0x0000530c 0xfc122c70 0x00000308 0
/pkg/lib/libbackplane.dll 0xfc1da000 0x0000134c 0xfc0c3e6c 0x000000a8 0
/pkg/lib/libnodeid.dll 0xfc1e7000 0x000091fc 0xfc1e61a8 0x00000208 0
/pkg/lib/libdebug.dll 0xfc23e000 0x0000ef64 0xfc1e6680 0x00000550 0
/pkg/lib/lib_procfs_util.dll 0xfc24d000 0x00004e2c 0xfc1e6bd0 0x000002a8 0
/pkg/lib/libsysdb.dll 0xfc252000 0x00046224 0xfc299000 0x0000079c 0
/pkg/lib/libsysdbutils.dll 0xfc29a000 0x0000ae04 0xfc29979c 0x000003ec 0
/pkg/lib/libwd_evmm.dll 0xfc2a9000 0x0000481c 0xfc299b88 0x00000188 0
/pkg/lib/libbag.dll 0xfc40c000 0x0000ee98 0xfc41b000 0x00000368 0
/pkg/lib/libwd_notif.dll 0xfc4f8000 0x00005000 0xfc4fd000 0x00001000 0
/pkg/lib/libifmgr.dll 0xfc665000 0x00029780 0xfc68f000 0x00003000 0
/pkg/lib/libnetio_client.dll 0xfca6a000 0x000065c8 0xfca2c4f8 0x000001b4 0
/pkg/lib/libpa_client.dll 0xfceec5000 0x00006e9c 0xfcecc000 0x00003000 0
/pkg/lib/libltime.dll 0xfcecf000 0x00002964 0xfcdc4f20 0x000000a8 0

```

Iteration 1 of 1

Current process = "pkg/bin/lpts_fm", PID = 139406 TID = 2

```

trace_back: #0 0xfc110744 [MsgSendv]
trace_back: #1 0xfc0fbf04 [msg_sendv]
trace_back: #2 0xfc0fbbd8 [msg_send]
trace_back: #3 0xfceec7580 [pa_fm_close]
trace_back: #4 0xfceec78b0 [pa_fm_process_0]

```

ENDOFSTACKTRACE

REPLY (node node0_RP1_CPU0, pid 57433)

No specific TID, following all threads of 57433 (pkg/bin/lpts_pa)

DLL Loaded by this process

DLL path	Text addr.	Text size	Data addr.	Data size	Version
/pkg/lib/libplatform.dll	0xfc0d6000	0x0000aa88	0xfc0e1000	0x00002000	0
/pkg/lib/libsysmgr.dll	0xfc0e3000	0x0000aeac	0xfc0c395c	0x00000388	0
/pkg/lib/libinfra.dll	0xfc0ee000	0x000332ec	0xfc122000	0x00000c70	0
/pkg/lib/libios.dll	0xfc123000	0x0002c4bc	0xfc150000	0x00002000	0
/pkg/lib/libc.dll	0xfc152000	0x00077ae0	0xfc1ca000	0x00002000	0
/pkg/lib/libltrace.dll	0xfc1cc000	0x00007f5c	0xfc0c3ce4	0x00000188	0
/pkg/lib/libsyslog.dll	0xfc1d4000	0x0000530c	0xfc122c70	0x00000308	0
/pkg/lib/libbackplane.dll	0xfc1da000	0x0000134c	0xfc0c3e6c	0x000000a8	0
/pkg/lib/libnodeid.dll	0xfc1e7000	0x000091fc	0xfc1e61a8	0x00000208	0
/pkg/lib/libdebug.dll	0xfc23e000	0x0000ef64	0xfc1e6680	0x00000550	0
/pkg/lib/lib_procfs_util.dll	0xfc24d000	0x00004e2c	0xfc1e6bd0	0x000002a8	0
/pkg/lib/libsysdb.dll	0xfc252000	0x00046224	0xfc299000	0x0000079c	0
/pkg/lib/libsysdbutils.dll	0xfc29a000	0x0000ae04	0xfc29979c	0x000003ec	0
/pkg/lib/libwd_evmm.dll	0xfc2a9000	0x0000481c	0xfc299b88	0x00000188	0
/pkg/lib/lrplib.dll	0xfc2f6000	0x0000a900	0xfc2f551c	0x00000610	0
/pkg/lib/liblrfuncs.dll	0xfc30e000	0x00001998	0xfc2ebd80	0x000001ec	0
/pkg/lib/libdscapi.dll	0xfc310000	0x0000457c	0xfc2f5b2c	0x0000035c	0
/pkg/lib/liblrdshared.dll	0xfc315000	0x00005fec	0xfc31b000	0x00002000	0
/pkg/lib/libbag.dll	0xfc40c000	0x0000ee98	0xfc41b000	0x00000368	0
/pkg/lib/libchkpt.dll	0xfc477000	0x0002ee04	0xfc474388	0x00000950	0
/pkg/lib/libwd_notif.dll	0xfc4f8000	0x00005000	0xfc4fd000	0x00001000	0
/pkg/lib/libltrace_sdt.dll	0xfc65c000	0x000034fc	0xfc65b73c	0x00000568	0
/pkg/lib/libfabhandle.dll	0xfc6be000	0x00003354	0xfc65bca4	0x00000248	0
/pkg/lib/libfsdb_ltrace_util_rt.dll	0xfc6ea000	0x00001b74	0xfc605e50	0x00000108	0
/pkg/lib/libbcdl.dll	0xfc6fb000	0x0000f220	0xfc6fa6e8	0x0000045c	0
/pkg/lib/liblpts_pa_fgid.dll	0xfc8d7000	0x00006640	0xfc7acd5c	0x00000208	0
/pkg/lib/libfgid.dll	0xfc910000	0x0001529c	0xfc926000	0x00002000	0

```
/pkg/lib/libltimes.dll 0xfcecf000 0x00002964 0xfcdc4f20 0x000000a8 0
```

```
Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 1
```

```
trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x48201904 [<N/A>]
trace_back: #6 0x48201e3c [<N/A>]
```

```
ENDOFSTACKTRACE
```

```
Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 2
```

```
trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x4821e978 [<N/A>]
```

```
ENDOFSTACKTRACE
```

```
Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 3
```

```
trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x482064c4 [<N/A>]
```

```
ENDOFSTACKTRACE
```

The following example shows how to use the **follow** command to debug the chain of threads blocking thread 2 associated with the process assigned PID 139406:

```
RP/0/RP0/CPU0:router# follow process 139406 blocked iteration 1 stackonly thread 2
```

```
Attaching to process pid = 139406 (pkg/bin/lpts_fm)
```

```
Iteration 1 of 1
```

```
-----
```

```
Current process = "pkg/bin/lpts_fm", PID = 139406 TID = 2
```

```
trace_back: #0 0xfc110744 [MsgSendv]
trace_back: #1 0xfc0fbf04 [msg_sendv]
trace_back: #2 0xfc0fbbd8 [msg_send]
trace_back: #3 0xfcec7580 [pa_fm_close]
trace_back: #4 0xfcec78b0 [pa_fm_process_0]
```

```
ENDOFSTACKTRACE
```

```
REPLY (node node0_RP1_CPU0, pid 57433)
```

```
No specific TID, following all threads of 57433 (pkg/bin/lpts_pa)
```

```
-----
```

```
Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 1
```

```
trace_back: #0 0xfc1106dc [MsgReceivev]
```

```

trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x48201904 [<N/A>]
trace_back: #6 0x48201e3c [<N/A>]

ENDOFSTACKTRACE

Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 2

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x4821e978 [<N/A>]

ENDOFSTACKTRACE

Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 3

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x482064c4 [<N/A>]

ENDOFSTACKTRACE

```

Related Commands

Command	Description
show processes	Displays information about the running processes.

monitor processes

To display auto-updating statistics on processes in a full-screen mode, use the **monitor processes** command in administration EXEC mode or in 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/module</i> notation.

Defaults

If you omit all keywords, the 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 **monitor processes** command by pressing the **q** key.

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 52](#).
- To terminate the display and return to the system prompt, enter the **q** key.

- To list the interactive commands, type ? during the display.

The available interactive commands are described in [Table 52](#).

Table 52 *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 is 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 is sample output from the **monitor processes** command using the optional **location** keyword and **node-id** argument:

```
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

monitor processes

```

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 is 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 53](#) describes the significant fields shown in the display.

Table 53 *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.

Table 53 *monitor processes Field Descriptions (continued)*

Field	Description
CPU	Percentage of CPU used by process thread.
NAME	Process name.

Using Interactive Commands

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 below:

```
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
monitor threads	Displays auto-updating process and thread statistics in a full-screen mode.
show processes	Displays information about the running processes.

monitor threads

To display auto-updating statistics on threads in a full-screen mode, use the **monitor threads** command in administration EXEC mode or in 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/module</i> notation.

Defaults

When all keywords are omitted, the 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 **monitor threads** command.

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 54](#).
- To terminate the display and return to the system prompt, enter the **q** key.
- To list the interactive commands, type **?** during the display.

The available interactive display commands are described in [Table 54](#).

Table 54 *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 is 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 is 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 55 describes the significant fields shown in the display.

Table 55 *monitor threads* Field Descriptions

Field	Description
JID	Job ID.
TIDS	Thread ID.
LAST_CPU	Number of open channels.
PRI	Priority level of the thread.
STATE	State of the thread.
HH:MM:SS	Run time of process since last restart.
CPU	Percentage of CPU used by process thread.
COMMAND	Process name.

Using Interactive Commands

When the **n** or **d** interactive command is used, the **monitor threads** command prompts for a number appropriate to the specific interactive command. The following is sample output from the **monitor threads** command showing the use of the interactive command **n** 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 interactive, auto-updating process statistics in a full-screen mode.

placement program

To enter placement program configuration mode to set process affinities (preferences), use the **placement program** command in global configuration mode. To remove the assigned process placement, use the **no** form of this command.

placement program {*program* [*instance instance*] | **default**}

no placement program *program* {*instance instance* | **default**}

Syntax Description

<i>program</i>	Process or group of processes.
instance <i>instance</i>	Specifies a program name that uniquely identifies a placement process. The process name is any alphanumeric string no longer than 40 characters.
default	Specifies all processes instead of a specific process instance.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **placement program** command allows you to change the placement policy for any placeable process, such as Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP).

Placement policy consists of two types: resource consumption and affinities. Resource consumption involves CPU and memory usage and is a “hard” resource requirement. Affinities are preferences, and are considered “soft” requirements for a placement policy. Only affinities can be configured by the operator.

The **placement program** command handles configuration for these affinity types:

- Affinity location set
- Affinity location type
- Affinity program
- Affinity self
- Affinity existence

To obtain a list of running placeable processes and placement policy parameters on your router system, use the **show placement policy** command.

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

The following example enters placement program configuration mode to set all Protocol Independent Multicast (PIM) processes on the node pair that it had already started on so that PIM does not move automatically when system conditions change:

```
RP/0/RP0/CPU0:router(config)# placement program pim
RP/0/RP0/CPU0:router(config-place)# affinity location-type current attract 100
```

Related Commands	Command	Description
	affinity location-set	Sets the affinity of a placeable program (process) to or from node pairs.
	affinity location-type	Sets the affinity of a placeable program (process) to or from a location type.
	affinity program	Sets the affinity of a placeable program (process) to or from another program.
	affinity self	Sets the affinity of a placeable program (process) to or from one of its own instances.
	show placement location	Displays all placeable programs (processes) by location.
	show placement policy	Displays placement policy parameters and programs.
	show placement program	Displays the operational state for each placement program.

placement reoptimize

To reoptimize the placement of processes on a system among the available RP and DRP nodes in a secure domain router (SDR), use the **placement** command in EXEC mode.

placement reoptimize

Syntax Description

This command has no arguments or keywords.

Defaults

The default is to reoptimize process placement for all processes.

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **placement reoptimize** command to reoptimize the placement of running processes on the available RP and DRP nodes. The processes are redistributed to the available nodes based on memory usage and other calculations. This **placement reoptimize** command first displays the predicted results of the reoptimization before running the command. You can accept the changes and run the command, or cancel the procedure without impacting the router.

Task ID

Task ID	Operations
sysmgr	read, write

Examples

The following example illustrates how to use the **placement reoptimize** command. The predicted changes are displayed, showing the current location of the process and the new location of the process. You can then decide to continue the operation or abort the reoptimization.

```
RP/0/RP0/CPU0:router# placement reoptimize
```

Predicted changes to the placement:

```
bpm                0/RP0/CPU0 (0/RP1/CPU0) --> 0/2/CPU0 (0/3/CPU0)
bgp instance 0     0/RP0/CPU0 (0/RP1/CPU0) --> 0/2/CPU0 (0/3/CPU0)
ipv4_rib           0/RP0/CPU0 (0/RP1/CPU0) --> 0/2/CPU0 (0/3/CPU0)
ipv4_arm           0/RP0/CPU0 (0/RP1/CPU0) --> 0/2/CPU0 (0/3/CPU0)
rcp_fs             0/RP0/CPU0 (0/RP1/CPU0) --> 0/2/CPU0 (0/3/CPU0)
```

Continue? [yes/no] **yes**

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

```
RP/0/RP0/CPU0:Nov 12 1:1:1.1 : placed[170]: %PLACED_PLACE-6-
```

REOP_START: Re-optimization of the placement requested. You will be notified on completion.

```
RP/0/RP0/CPU0:Nov 12 1:1:1.1 : placed[254]: %OS-PLACED_PLACE-6-REOP_COMPLETE
```

: Re-optimization of the placement complete. Use 'show placement' to view the new placement

Related Commands

Command	Description
show placement reoptimize	Displays information about process placements by node or process.

process

To start, terminate, or restart a process, use the **process** command in administration EXEC mode.

```
process { blocked | crash | restart | shutdown | start } { executable-name | job-id } { location
{ node-id | all } }
```

Syntax Description

blocked	Collects debug information. The node is restarted if the mandatory reboot flag is set.
crash	Crashes a process.
restart	Restarts a process.
shutdown	Stops a process. The process is not restarted (even if considered “mandatory”).
start	Starts a process.
<i>executable-name</i>	(Optional) Executable name of the process to be started, terminated, 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>job-id</i>	(Optional) Job ID of the process instance to be started, terminated, or restarted. Supplying a job ID for the <i>job-id</i> argument performs the action for only the process instance associated with the job ID.
location <i>node-id</i>	(Optional) Starts, terminates, or restarts a process on the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
location all	(Optional) Starts, terminates, or restarts a process on all nodes.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The shutdown keyword was introduced to replace the kill keyword. Support for the crash keyword was added to crash a process.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	This command was removed from EXEC mode.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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, start, 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 shutdown

The **process shutdown** command shuts down (terminates) the specified process and copies associated with the specified process. The process is not restarted, even if considered “mandatory.” Use the **show processes** command to display a list of executable processes running on the system.

**Caution**

Stopping a process can result in an RP failover, system failure or both. This command is intended for use only under the direct supervision of a Cisco Technical Support representative.

process restart

The **process restart** command restarts a process, such as a process that is not functioning optimally.

process start

The **process start** command starts a process that is not currently running, such as a process that was terminated using the **process kill** command. If multiple copies are on the system, all instances of the process are started simultaneously.

process blocked

This command is used by Cisco Technical Support engineers to collect debug information about a process. If the **process mandatory** command is set for a process, the **process blocked** command also causes the node to restart.

Task ID

Task ID	Operations
root-lr	execute

Examples

The following example shows how to restart a process. In this example, the IS-IS process is restarted:

```
RP/0/RP0/CPU0:router# process restart isis
```

```
RP/0/RP0/CPU0:router#RP/0/RP0/CPU0:Mar 30 15:24:41 : isis[343]: %ISIS-6-INFO_ST
RTUP_START : Cisco NSF controlled start beginning
RP/0/RP0/CPU0:router#RP/0/RP0/CPU0:Mar 30 15:24:52 : isis[352]: %ISIS-6-INFO_ST
RTUP_FINISH : Cold controlled start completed
```

The following example shows how to terminate a process. In this example, the IS-IS process is stopped:

```
RP/0/RP0/CPU0:router# process shutdown isis
RP/0/RP0/CPU0:router#
```

The following example shows how to start a process. In this example, the IS-IS process is started:

```
RP/0/RP0/CPU0:router# process start isis

RP/0/RP0/CPU0:router#RP/0/RP0/CPU0:Mar 30 15:27:19 : isis[227]: %ISIS-6-INFO_STA
RTUP_START : Cold controlled start beginning
RP/0/RP0/CPU0:Mar 30 15:27:31 : isis[352]: %ISIS-6-INFO_STARTUP_FINISH : Cold co
ntrolled start completed
```

Related Commands

Command	Description
process mandatory	Sets the options for mandatory processes.
show processes	Displays information about the running processes.

process core

To modify the core dump options for a process, use the **process core** command in administration EXEC mode or in EXEC mode.

process {*executable-name* | *job-id*} **core** {**context** | **copy** | **fallback** | **iomem** | **mainmem** | **off** | **sharedmem** | **sparse** | **sync** | **text**} [**maxcore** *value*] **location** *node-id*

Syntax Description

<i>executable-name</i>	Executable name of the process for which you want to change core dump options. Specifying a value for the <i>executable-name</i> argument changes the core dump option for multiple instances of a running process.
<i>job-id</i>	Job ID associated with the process instance. Specifying a <i>job-id</i> value changes the core dump option for only a single instance of a running process.
context	Dumps only context information for a process.
copy	Copies a core dump locally before performing the core dump.
fallback	Sets the core dump options to use the fallback options (if needed).
iomem	Dumps the I/O memory of a process.
mainmem	Dumps the main memory of a process.
off	Indicates that a core dump is not taken on the termination of the specified process.
sharedmem	Dumps the shared memory of a process.
sparse	Enables sparse core dumps of a process.
sync	Enables only synchronous core dumping.
text	Dumps the text of a process.
maxcore <i>value</i>	(Optional) Specifies the maximum number of core dumps allowed for the specified process on its creation.
location <i>node-id</i>	Sets the core dump options for a process on a designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

By default, processes are configured to dump shared memory, text area, stack, data section, and heap information.

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.

Release	Modification
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. The mainmem-sharedmem , mainmem-text , mainmem-text-sharedmem keyword options were removed. The context , fallback , iomem , sync , and text keyword options were introduced.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The modular architecture of the Cisco IOS XR software allows core dumps for individual processes. By default, processes are configured to dump shared memory, text area, stack, data section, and heap information.

Specifying an executable name for the *executable-name* argument changes the core dump option for all instances of the process. Specifying a job ID for the *job-id* value changes the core dump option for a single instance of a running process.

Task ID

Task ID	Operations
root-lr	execute

Examples

The following example shows how to enable the collection of shared memory of a process:

```
RP/0/RP0/CPU0:router# process ospf core sharedmem
```

The following example shows how to turn off core dumping for a process:

```
RP/0/RP0/CPU0:router# process media_ether_config_di core off
```

Related Commands

Command	Description
show processes	Displays information about the running processes.

process mandatory

To set the mandatory reboot options for a process, use the **process mandatory** command in administration EXEC mode or in EXEC mode.

process mandatory

process mandatory { **on** | **off** } { *executable-name* | *job-id* } **location** *node-id*

process mandatory reboot

process mandatory reboot { **enable** | **disable** }

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.
reboot { enable disable }		Enables or disables the reboot action when a mandatory process fails.
toggle		Toggles a mandatory process attribute.
<i>executable-name</i>		Executable name of the process to be terminated. Specifying a 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>		(Optional) Sets the mandatory settings for a process on a designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults	No default behavior or values

Syntax Description	Administration EXEC EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.

process mandatory

Release	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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/RP0/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/RP0/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 the running processes.

show context

To display core dump context information, use the **show context** command in administration EXEC mode or in 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. For example, entering a value of 1 for the <i>coredump-occurrence</i> argument displays core dump context information for the most recent core dump, while entering a value of 2 for the <i>coredump-occurrence</i> argument displays information for the second most recent core dump. This command stores context information for the last 10 core dumps.
clear	(Optional) Clears the current context information.
location { <i>node-id</i> all }	(Optional) Displays core dump information that occurred on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

Defaults

If no *coredump-occurrence* value is specified, core dump context information for all core dumps is displayed.

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** command to clear core dump context information.

Task ID**Task ID Operations**

diag	read

Examples

The following is 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 is 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 56 describes the significant fields shown in the display.

Table 56 *show context Field Descriptions*

Field	Description
Crashed pid =	Process ID (PID) of the crashed process followed by the executable path.
Crash time	Time and date the crash occurred.
Core for process at	File path to the core dump file.
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 mode.

show dll [**jobid** *job-id* [**virtual**] | **address** *virtual-address* | **dllname** *dll-virtual-path* | **memory** | **symbol address** *virtual-address* | **virtual**] [**location** *node-id*]

Syntax Description

jobid <i>job-id</i> [virtual]	(Optional) Displays DLL information for the specified job identifier.
virtual	(Optional) Displays the virtual path of DLLs. The virtual path is expressed in the <i>/pkg/lib/library-name.dll</i> format where the <i>library-name</i> is the name of the DLL followed by the <i>.dll</i> suffix.
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.
symbol address <i>virtual-address</i>	(Optional) Displays the symbol at the virtual address specified for the <i>virtual-address</i> argument.
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/module</i> notation.

Defaults

No default behavior or values

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID**Task ID Operations**

basic-services	read

Examples

The following is 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/crs-base-0.48.0/lib/liblogin.dll	0xfc008000	0x00006000	0xfc00e000	0x00001000	1
/mbi/lib/libbanner.dll	0xfc00f000	0x00003000	0xfc012000	0x00001000	1
/disk0/crs-base-0.48.0/lib/libaaav2.dll	0xfc013000	0x0000f000	0xfc022000	0x00001000	1
/disk0/crs-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/crs-admin-0.48.0/lib/libfgm_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/crs-base-0.48.0/lib/liblpts_ifib_platform.dll	0xfc1d730c	0x00000cc8	0xfceef4000	0x00000068	1
/lib/libbackplane.dll	0xfc1d8000	0x0000134c	0xfc0c2e4c	0x000000a8	163
/disk0/crs-base-0.48.0/lib/libipv6_platform_client.dll	0xfc1d934c	0x00000c48	0xfceef4f8c	0x00000068	1
/mbi/lib/libpkgfs_node.dll	0xfc1da000	0x000092d4	0xfc1e4000	0x000001a8	3

The following is sample output from the **show dll** command with the optional **jobid** keyword and **job-id** 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 57 describes the significant fields shown in the display.

Table 57 *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	Count of the number of clients using the DLL.

The following is sample output from the **show dll** command with the optional **dllname** keyword and optional *dll-virtual-path* 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 58 describes the significant fields shown in the display.

Table 58 *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 is sample output from the **show dll** 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 administration EXEC mode or in EXEC mode.

show exception

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	Administration EXEC EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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](#)
- [exception pakmem](#)
- [exception sparse](#)
- [exception sprsize](#)

■ show exception

Task ID	Task ID	Operations
	diag	read

Examples

The following is sample output from the **show exception** command:

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

```
Choice 1 path = harddisk:/coredump compress = on filename = <process_name.time>
Choice 2 path = tftp://223.255.254.254/users/xyz compress = on filename =
<process_name.time>
Exception path for choice 3 is not configured or removed
Choice fallback one path = harddisk:/dumper compress = on filename = <process_name>
Choice fallback two path = disk1:/dumper compress = on filename = <process_name>
Choice fallback three path = disk0:/dumper compress = on filename = <process_name>
Kernel dump not configured
Tftp route for kernel core dump not configured
Dumper packet memory in core dump enabled
Sparse core dump enabled
Dumper will switch to sparse core dump automatically at size 300MB
```

Related Commands

Command	Description
exception filepath	Modifies core dump settings.
exception pakmem	Collects packet memory information in core dumps.
exception sparse	Enables or disables sparse core dumps.
exception sprsize	Sets the maximum size of core dump files.

show memory

To display the available physical memory and memory usage information of processes on the router, use the **show memory** command in administration EXEC mode or in EXEC mode.

show memory [*job-id* | **summary** [**bytes** | **detail**]] **location** *node-id*

Syntax Description	<i>job-id</i>	(Optional) Job ID associated with a process instance. Specifying a job ID for the <i>job-id</i> argument displays the memory available and memory usage information for only the process associated with the specified job ID. If the <i>job-id</i> argument is not specified, this command displays information for all running processes.
	summary	(Optional) Displays a summary of the physical memory and memory usage information.
	bytes	(Optional) Displays numbers in bytes for an exact count.
	detail	(Optional) Displays numbers in the format “nnn.dddM” for more detail.
	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/module</i> notation.

Defaults No default behavior or values

Command Modes Administration EXEC
EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

■ **show memory**

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

The following is partial sample output from the **show memory** command entered without keywords or arguments. This command displays details for the entire router.

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

```
Physical Memory:2048M total
Application Memory :1802M (1636M available)
Image:116M (bootram:116M)
Reserved:128M, IOMem:0, flashfsys:0
Total shared window:0
```

```
kernel:jid 1
Address      Bytes      What
0008f000    12288      Program Stack
000b2000    12288      Program Stack
Total Allocated Memory:0
Total Shared Memory:0
```

```
sbin/devc-pty:jid 68
Address      Bytes      What
4817f000     4096      Program Stack (pages not allocated)
48180000    516096     Program Stack (pages not allocated)
481fe000     8192      Program Stack
48200000    28672     Physical Mapped Memory
48207000     4096      ANON FIXED ELF SYSRAM
48208000     4096      ANON FIXED ELF SYSRAM
```

The following is sample output from the **show memory** command entered with the job ID 7 to show the memory usage information for the process associated with this job identifier:

```
RP/0/RP0/CPU0:router# show memory 7
```

```
Physical Memory: 256M total
Application Memory : 249M (217M available)
Image: 2M (bootram: 2M)
Reserved: 4M, IOMem: 0, flashfsys: 0
```

```
sbin/pipe: jid 7
Address      Bytes      What
07f7c000    126976     Program Stack (pages not allocated)
07f9b000     4096      Program Stack
07f9d000    126976     Program Stack (pages not allocated)
07fbc000     4096      Program Stack
07fbe000    126976     Program Stack (pages not allocated)
07fdd000     4096      Program Stack
07fdf000    126976     Program Stack (pages not allocated)
07ffe000     4096      Program Stack
08000000    122880     Program Stack (pages not allocated)
0801e000     8192      Program Stack
08020000    12288     Physical Mapped Memory
08023000     4096      Program Text or Data
08024000     4096      Program Text or Data
```

```

08025000      16384      Allocated Memory
08029000      16384      Allocated Memory
7c001000      319488     DLL Text libc.dll
7e000000      8192       DLL Data libc.dll

```

The following example shows how to display a detailed summary of memory information for the router:

```
RP/0/0/CPU0:router# show memory summary detail
```

```

Physical Memory: 256.000M total
Application Memory : 140.178M (15.003M available)
Image: 95.739M (bootram: 95.739M)
Reserved: 20.000M, IOMem: 0, flashfsys: 0
Shared window fibv6: 257.980K
Shared window PFI_IFH: 207.925K
Shared window aib: 8.972M
Shared window infra_statsd: 3.980K
Shared window ipv4_fib: 1.300M
Shared window atc_cache: 35.937K
Shared window qad: 39.621K
Total shared window: 10.805M
Allocated Memory: 49.933M
Program Text: 6.578M
Program Data: 636.000K
Program Stack: 4.781M

```

Table 59 describes the significant fields shown in the display.

Table 59 *show memory summary Field Descriptions*

Field	Description
Physical Memory	Available physical memory on the router.
Application Memory	Current memory usage of all the processes on the router.
Image	Memory that is currently used by the image, and available memory.
Reserved	Total reserved memory.
IOMem	Available I/O memory.
flashfsys	Total flash memory.
Shared window fibv6	Internal shared window information.
Shared window PFI_IFH	Internal shared window information.
Shared window aib	Internal shared window information.
Shared window infra_statsd	Internal shared window information.
Shared window ipv4_fib	Internal shared window information.
Shared window atc_cache	Internal shared window information.
Shared window qad	Internal shared window information.
Total shared window	Internal shared window information.
Allocated Memory	Amount of memory allocated for the specified node.
Program Text	Internal program test information.
Program Data	Internal program data information.
Program Stack	Internal program stack information.

■ show memory

Related Commands	Command	Description
	show memory heap	Displays information about the heap space for a process.
	show processes	Displays information about the running 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 administration EXEC mode or in 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.

Defaults	No default behavior or values

Command Modes	Administration EXEC EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

show memory compare

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 start** command to take the initial snapshot of heap memory usage for all processes on the router.



Note The snapshot is similar to that resulting from entry of the **show memory heap** command with the optional **summary** keyword.

2. Perform the test you want to analyze.
3. Enter the **show memory compare end** command to take the snapshot of heap memory usage to be compared with the initial snapshot.
4. Enter the **show memory compare report** command to display the heap memory usage comparison report.

Task ID

Task ID	Operations
basic-services	read

Examples

The following is sample output from the **show memory compare report** command:

```
RP/0/RP0/CPU0:router# show memory compare report
```

JID	name	mem before	mem after	difference	mallocs	restarted
---	----	-----	-----	-----	-----	-----
84	driver_infra_partner	577828	661492	83664	65	
279	gsp	268092	335060	66968	396	
236	snap_transport	39816	80816	41000	5	
237	mpls_lsd_agent	36340	77340	41000	5	
268	fint_partner	24704	65704	41000	5	
90	null_caps_partner	25676	66676	41000	5	
208	aib	55320	96320	41000	5	
209	ipv4_io	119724	160724	41000	5	
103	loopback_caps_partne	33000	74000	41000	5	
190	ipv4_arm	41432	82432	41000	5	
191	ipv6_arm	33452	74452	41000	5	
104	sysldr	152164	193164	41000	5	
85	nd_partner	37200	78200	41000	5	
221	clns	61520	102520	41000	5	
196	parser_server	1295440	1336440	41000	5	
75	bundlemgr_distrib	57424	98424	41000	5	
200	arp	83720	124720	41000	5	
201	cdp	56524	97524	41000	5	
204	ether_caps_partner	39620	80620	41000	5	
206	qosmgr	55624	96624	41000	5	
240	imd_server	92880	104680	11800	28	
260	improxy	77508	88644	11136	10	
111	nrssvr	29152	37232	8080	60	
275	sysdb_svr_local	1575532	1579056	3524	30	
205	cfgmgr	31724	33548	1824	25	
99	sysdb_svr_shared	1131188	1132868	1680	14	

51	mbus-rp	26712	27864	1152	4	
66	wdsysmon	298068	299216	1148	15	
168	netio	1010912	1012060	1148	6	
283	itrace_manager	17408	17928	520	3	
59	devc-conaux	109868	110300	432	4	
67	syslogd_helper	289200	289416	216	2	
117	fcctl	41596	41656	60	2	
54	sysmgr	171772	171076	-696	-5	
269	ifmgr	539308	530652	-8656	-196	*

Table 60 describes the significant fields shown in the display.

Table 60 *show memory compare report Field Descriptions*

Field	Description
JID	Process job 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 the running processes.

show memory heap

To display information about the heap space for a process, use the **show memory heap** command in administration EXEC mode or in EXEC mode.

show memory heap [*job-id* | **allocated** [**dllname**] [**free**] *job-id* | **dllname** *job-id* | **free** [**dllname**] *job-id* | **failure** {*job-id* | **all**} | **summary** {*job-id* | **all**}]

Syntax Description

<i>job-id</i>	Job ID associated with the process instance.
allocated	(Optional) Displays a list of all allocated heap blocks.
dllname	(Optional) Displays heaps with dynamic link library (DLL) names.
failure	(Optional) Displays a summary of heap failures.
free	(Optional) Displays a list of all free heap blocks.
summary	(Optional) Displays a summary of the information about the heap space.
all	Displays information about the heap space for all processes.

Defaults

No default behavior or values

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	basic-services	read

Examples

The following is sample output from the **show memory heap** command, specifying a job ID for the *job-id* argument:

```
RP/0/RP0/CPU0:router# show memory heap 111

Malloc summary for pid 16433:
  Heapsize 16384: allocd 6328, free 8820, overhead 1236
  Calls: mallocs 144; reallocs 73; frees 5; [core-allocs 1; core-frees 0]
Block Allocated List
Total      Total      Block      Name/ID/Caller
Usize      Size      Count
0x000008c1 0x000008cc 0x00000001 0x7c018a10
0x000005ac 0x00000974 0x00000079 0x7c02b9e0
0x000004f0 0x000004f8 0x00000001 0x7c02b6fc
0x00000080 0x00000088 0x00000001 0x7c01936c
0x00000034 0x00000048 0x00000001 0x7c018954
0x00000024 0x00000030 0x00000001 0x7c019278
0x00000018 0x00000020 0x00000001 0x7c019b2c
0x00000008 0x00000010 0x00000001 0x7c017178
0x00000008 0x00000010 0x00000001 0x7c00fb54
0x00000008 0x00000010 0x00000001 0x7c00fb80
0x00000008 0x00000010 0x00000001 0x7c00fbb8
```

Table 61 describes the significant fields shown in the display.

Table 61 *show memory heap Field Descriptions*

Field	Description
Malloc summary for pid	System-defined process ID (PID).
Heapsize	Size of the heap as allocated from the system by the malloc library.
allocd	Bytes allocated to the process.
free	Bytes available in the heap.
overhead	Malloc library overhead in bytes.
mallocs	Number of malloc calls.
reallocs	Number of realloc calls.
frees	Number of invocations to the caller interface provided in the malloc library for deallocating the memory.
[core-allocs 1; core-frees 0]	Number of core memory units, the memory units in the malloc library allocated by the system for the heap, allocated and freed.

The following is sample output from the **show memory heap** command, specifying the **summary** keyword and a job ID for the *job-id* argument:

```
RP/0/RP0/CPU0:router# show memory heap summary 65

Malloc summary for pid 20495 process pcmciad:
```

■ show memory heap

```

Heapsize 65536: allocd 40332, free 16568, overhead 8636
Calls: mallocs 883; reallocs 3; frees 671; [core-allocs 4; core-frees 0]
Band size 16, element per block 48, nbuint 1
  Completely free blocks: 0
  Block allocated: 2, Block freed: 0
  allocs: 85, frees: 20
  allocmem: 1040, freemem: 496, overhead: 448
  blocks: 2, blknodes: 96
Band size 24, element per block 34, nbuint 1
  Completely free blocks: 0
  Block allocated: 1, Block freed: 0
  allocs: 243, frees: 223
  allocmem: 480, freemem: 336, overhead: 168
  blocks: 1, blknodes: 34
Band size 32, element per block 26, nbuint 1
  Completely free blocks: 0
  Block allocated: 1, Block freed: 0
  allocs: 107, frees: 97
  allocmem: 320, freemem: 512, overhead: 136
  blocks: 1, blknodes: 26
Band size 40, element per block 22, nbuint 1
  Completely free blocks: 0
  Block allocated: 2, Block freed: 0
  allocs: 98, frees: 74
  allocmem: 960, freemem: 800, overhead: 240
  blocks: 2, blknodes: 44
Band size 48, element per block 18, nbuint 1
  Completely free blocks: 0
  Block allocated: 1, Block freed: 0
  allocs: 53, frees: 42
  allocmem: 528, freemem: 336, overhead: 104
  blocks: 1, blknodes: 18
Band size 56, element per block 16, nbuint 1
  Completely free blocks: 0
  Block allocated: 1, Block freed: 0
  allocs: 8, frees: 4
  allocmem: 224, freemem: 672, overhead: 96
  blocks: 1, blknodes: 16
Band size 64, element per block 14, nbuint 1
  Completely free blocks: 0
  Block allocated: 1, Block freed: 0
  allocs: 6, frees: 2
  allocmem: 256, freemem: 640, overhead: 88
  blocks: 1, blknodes: 14
Band size 72, element per block 12, nbuint 1
  Completely free blocks: 0
  Block allocated: 1, Block freed: 0
  allocs: 1, frees: 0
  allocmem: 72, freemem: 792, overhead: 80
  blocks: 1, blknodes: 12

```

Table 62 describes the significant fields shown in the display.

Table 62 *show memory heap summary Field Descriptions*

Field	Description
Malloc summary for pid	System defined process ID (pid).
Heapsize	Size of the heap as allocated from the system by the malloc library.
allocd	Bytes allocated to the process.

Table 62 *show memory heap summary Field Descriptions (continued)*

Field	Description
free	Bytes available in the heap.
overhead	Malloc library overhead in bytes.
mallocs	Number of malloc calls.
reallocs	Number of realloc calls.
frees	Number of invocations to the caller interface provided in the malloc library for deallocating the memory.
[core-allocs 1; core-frees 0]	Number of core memory units, the memory units in the malloc library allocated by the system for the heap, allocated and freed.
Band size	Small memory elements are arranged in bands. The band size specifies the size of elements within the band.
element per block	Number of elements per block in the band.
nbunit	Number of memory unit one block consists of. Any block in any band should be of a size that is an integer multiple of this basic unit.
Completely free blocks	Number of blocks in the band completely free (available for allocation).
Block allocated	Number of blocks currently allocated for the band.
allocs	Number of allocations currently performed from the band.
frees	Number of free calls that resulted in memory being returned to the band.
allocmem	Amount of memory currently allocated from the band.
overhead	Amount of memory in bytes as overhead for managing the band.
blocks	Number of blocks currently in the band.
blknodes	Number of nodes (elements) in all the blocks in the band.

Related Commands

Command	Description
show memory	Displays the available physical memory and processes memory on a router.

show placement location

To display all placeable processes by location, use the **show placement location** command in EXEC mode.

show placement location {*node-id* | **all**}

Syntax Description	<i>node-id</i>	The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
	all	Displays all placement locations.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .
	The show placement location command identifies the process placement locations, the operational state of the nodes, and the processes currently running on the nodes.

To display the node location and operational state for a program, use the **show placement program** command.

Task ID	Task ID	Operations
	sysmgr	read

Examples

The following example shows all the nodes on the routing system and the placeable programs on those node locations:

```
RP/0/RP0/CPU0:router# show placement location all
```

```
Locations: [0/RP0/CPU0] 0/RP1/CPU0 (RP)
State: running   Primary: yes   Paired: no
```

Programs placed at this location:

```
rt_check_mgr
fm_server
fm_script_dir
fm_metric_dir
fm_fd_stats
fm_fd_hardware
fm_fd_drvinfra
fm_fd_counter
ipv6_rump
ipv6_local
ipv6_connected
ipv4_rump
ipv4_local
ipv4_connected
tftp_fs
rcp_fs
ftp_fs
domain_services
bfd
ipv6_mpa
ipv4_mpa
ipv6_arm
ipv4_arm
policy_repository
ipv6_rib
ipv4_rib
cdp_mgr
statsd_manager
```

Table 63 describes the significant fields shown in the display.

Table 63 *show placement location Field Descriptions*

Field	Description
Locations	Physical placement locations identified on the routing system.
State	Operational state of the nodes.
Primary	Whether or not the locations are primary nodes.
Paired	Whether or not the locations are node pairs (active and standby).
Programs placed at this location	All processes that are currently placed at the location.

Related Commands

Command	Description
show placement program	Displays the operational state for each placement program.

show placement policy

To display placement policy parameters and programs, use the **show placement policy** command in EXEC mode.

show placement policy {**global** | **program** {*program* | **all** | **default**}}

Syntax Description	global	Displays system-wide placement policies.
	program	Displays program placement policies.
	<i>program</i>	Specific program or program group.
	all	Displays all program placement policies.
	default	Displays the default placement policies.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1.
	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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show placement policy** command displays placement policy items that influence program or process placement. The **global** option lists the per node threshold parameters, and the remaining options list the policy based on program.

If you configured the placement policy, the scope could be the default program, a given program, or even a particular program instance. Alternatively, the policy could be specified in a placement file (entered by the system) with different levels of affinities. To view all this information, you can specify the **program all** option to display the source of each program, and the policy applied to the default program or the program that you configured to override it.

Task ID	Task ID	Operations
	sysmgr	read

Examples

The following example shows how to display the global parameters for the placement policy:

```
RP/0/RP0/CPU0:router# show placement policy global
```

```
Per-location placement policy parameters
-----
Memory preferred threshold:      80%
Memory maximum threshold:      200%
Threshold satisfaction affinity points:  50
```

Table 64 describes the significant fields shown in the display.

Table 64 *show placement policy global Field Descriptions*

Field	Description
Memory preferred threshold	Memory threshold that should not be exceeded when placing processes.
Memory maximum threshold	Hard-memory threshold that should not be exceeded when placing processes.
Threshold satisfaction affinity points	Number of affinity points awarded to a node with empty CPU or memory. Points are lowered as CPU or memory is used, reaching zero when the threshold value is reached.

The following example displays placement policy for all programs running on the system:

```
RP/0/RP0/CPU0:router# show placement policy program all
```

```
Program: rsvp                                     : source
-----
Assumed mem:                1 MB                  : system [default]
Slow migration interval:    1 second              : system [default]

affinity location-type primary attract 40         : system [default]
affinity location-type paired attract 60          : system [default]
affinity existence attract 90                     : system [default]
affinity location-type current attract 100        : system [default]

Program: [default]                               : source
-----
Assumed mem:                1 MB                  : system [default]
Slow migration interval:    1 second              : system [default]

affinity location-type primary attract 40         : system [default]
affinity location-type paired attract 60          : system [default]
affinity existence attract 90                     : system [default]
affinity location-type current attract 100        : system [default]

Program: mpls_static                               : source
-----
Assumed mem:                1 MB                  : system [default]
Slow migration interval:    1 second              : system [default]
```

■ show placement policy

```

affinity location-type primary attract 40      : system [default]
affinity location-type paired attract 60      : system [default]
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: mpls_rid_helper                       : source
-----
Assumed mem:                                1 MB      : system [default]
Slow migration interval:                    1 second  : system [default]

affinity location-type primary attract 40      : system [default]
affinity location-type paired attract 60      : system [default]
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: mpls_ldp                             : source
-----
Assumed mem:                                1 MB      : system [default]
Slow migration interval:                    1 second  : system [default]

affinity location-type primary attract 40      : system [default]
affinity location-type paired attract 60      : system [default]
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: isis                                 : source
-----
Assumed mem:                                1 MB      : system [default]
Slow migration interval:                    1 second  : system [default]

affinity location-type primary repulse 40     : system isis
affinity location-type paired attract 60      : system [default]
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: ipv6_static                          : source
-----
Assumed mem:                                1 MB      : system [default]
Slow migration interval:                    1 second  : system [default]

affinity location-type primary repulse 40     : system ipv6_static
affinity location-type paired attract 60      : system [default]
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: ipv4_static                          : source
-----
Assumed mem:                                1 MB      : system [default]
Slow migration interval:                    1 second  : system [default]

affinity location-type primary repulse 40     : system ipv4_static
affinity location-type paired attract 60      : system [default]
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: brib                                 : source
-----
Assumed mem:                                1 MB      : system [default]
Slow migration interval:                    1 second  : system [default]

affinity location-type current attract 600    : system brib
affinity location-type paired attract 200     : system brib
affinity location-type primary repulse 150    : system brib

```

```

affinity program ipv6_rib attract 70          : system brib
affinity program ipv4_rib attract 70          : system brib
affinity existence attract 90                 : system [default]

Program: ipv6_rib                             : source
-----
Assumed mem:                                1 MB          : system [default]
Slow migration interval:                    1 second      : system [default]

affinity location-type paired attract 250     : system ipv6_rib
affinity location-type primary repulse 200    : system ipv6_rib
affinity program brib attract 70              : system ipv6_rib
affinity program bgp attract 250              : system ipv6_rib
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: ipv4_rib                             : source
-----
Assumed mem:                                1 MB          : system [default]
Slow migration interval:                    1 second      : system [default]

affinity location-type paired attract 250     : system ipv4_rib
affinity location-type primary repulse 200    : system ipv4_rib
affinity program brib attract 70              : system ipv4_rib
affinity program bgp attract 250              : system ipv4_rib
affinity existence attract 90                  : system [default]
affinity location-type current attract 100     : system [default]

Program: bgp                                  : source
-----
Assumed mem:                                1 MB          : system [default]
Slow migration interval:                    1 second      : system [default]

affinity location-type current attract 600    : system bgp
affinity location-type paired attract 50      : system bgp
affinity location-type primary repulse 50     : system bgp
affinity self repulse 160                     : system bgp
affinity program ipv6_rib attract 250         : system bgp
affinity program ipv4_rib attract 250         : system bgp
affinity existence attract 90                  : system [default]

```

Table 65 describes the significant fields shown in the display.

Table 65 *show placement policy program all Field Descriptions*

Field	Description
program	Placement policy program.
source	Position in the hierarchy for the policy origination: default entity, process class, or specific instance.
Assumed mem	Memory usage value from configuration or program placement file; defaults to 1 MB.

show placement program

To display the operational state for each placement program, use the **show placement program** command in EXEC mode.

show placement program {*program* | **all**}

Syntax Description

<i>program</i>	Specific program or program group.
all	Displays operational state for all placement programs.

Defaults

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show placement program** command displays information that identifies that the process (or program) is running, where the process is located, locations where the process was rejected, and location where the process is waiting to start.

Task ID

Task ID	Operations
sysmgr	read

Examples

The following example shows that all placement programs are running on the node pair 0/RP0/CPU0 and 0/RP1/CPU0:

```
RP/0/RP0/CPU0:router# show placement program all
```

```
Mon Aug 18 17:13:15.155 PST DST
```

If a program is shown as having 'rejected locations' (i.e., locations on which it cannot be placed), the locations in question can be seen using the "show placement policy program" command.

If a program has been placed but not yet started, the amount of time elapsed since the program was placed is shown in the 'waiting to start' field.

Parentheses around the node indicate that the node has not yet fully booted. This will be true of standby nodes.

Program	Placed at location	# rejected locations	Waiting to start
li_mgr	0/RP0/CPU0 (0/RP1/CPU0)		
rsi_master	0/RP0/CPU0 (0/RP1/CPU0)		
statsd_manager	0/RP0/CPU0 (0/RP1/CPU0)		
ipv4_rib	0/RP0/CPU0 (0/RP1/CPU0)		
ipv6_rib	0/RP0/CPU0 (0/RP1/CPU0)		
policy_repository	0/RP0/CPU0 (0/RP1/CPU0)		
ipv4_mpa	0/RP0/CPU0 (0/RP1/CPU0)		
ipv6_mpa	0/RP0/CPU0 (0/RP1/CPU0)		
bfd	0/RP0/CPU0 (0/RP1/CPU0)		
domain_services	0/RP0/CPU0 (0/RP1/CPU0)		
ftp_fs	0/RP0/CPU0 (0/RP1/CPU0)		
rcp_fs	0/RP0/CPU0 (0/RP1/CPU0)		
tftp_fs	0/RP0/CPU0 (0/RP1/CPU0)		
ipv4_connected	0/RP0/CPU0 (0/RP1/CPU0)		
ipv4_local	0/RP0/CPU0 (0/RP1/CPU0)		
ipv4_rump	0/RP0/CPU0 (0/RP1/CPU0)		
ipv6_connected	0/RP0/CPU0 (0/RP1/CPU0)		
ipv6_local	0/RP0/CPU0 (0/RP1/CPU0)		
ipv6_rump	0/RP0/CPU0 (0/RP1/CPU0)		
atmgcmgr	0/RP0/CPU0 (0/RP1/CPU0)		
eem_metric_dir	0/RP0/CPU0 (0/RP1/CPU0)		
l2tp_mgr	0/RP0/CPU0 (0/RP1/CPU0)		
l2vpn_mgr	0/RP0/CPU0 (0/RP1/CPU0)		
rt_check_mgr	0/RP0/CPU0 (0/RP1/CPU0)		
ipv4_static	0/RP0/CPU0 (0/RP1/CPU0)		
isis instance lab	0/RP0/CPU0 (0/RP1/CPU0)		
ospf instance 100	0/RP0/CPU0 (0/RP1/CPU0)		
isis_uv	0/RP0/CPU0 (0/RP1/CPU0)		
ospf_uv	0/RP0/CPU0 (0/RP1/CPU0)		
mpls_vpn_mib	0/RP0/CPU0 (0/RP1/CPU0)		
rsvp	0/RP0/CPU0 (0/RP1/CPU0)		
mpls_ldp	0/RP0/CPU0 (0/RP1/CPU0)		
lspv_server	0/RP0/CPU0 (0/RP1/CPU0)		
ospf instance 0	0/RP0/CPU0 (0/RP1/CPU0)		
ospfv3 instance 0	0/RP0/CPU0 (0/RP1/CPU0)		
ospfv3_uv	0/RP0/CPU0 (0/RP1/CPU0)		

Table 66 describes the significant fields shown in the display.

Table 66 *show placement program Field Descriptions*

Field	Description
Program	Name of the program that is placed.
Placed at location	Location of the RP at which this process is placed along with the paired node information.

 show placement program**Table 66** *show placement program Field Descriptions (continued)*

Field	Description
rejected locations	Lists of nodes from which the program was rejected.
Waiting to start	The program is waiting in the process placement queue.

Related Commands

Command	Description
show placement policy	Displays placement policy parameters and programs.

show placement reoptimize

To display the predicted changes to reoptimize the placement of processes, use the **show placement reoptimize** command in EXEC mode.

show placement reoptimize [**program** {*program* **instance** *program-instance* | **all**}]

Syntax Description

program	(Optional) Displays changes for a particular program.
<i>program</i>	A specific program or program group.
instance <i>program-instance</i>	A specific program within a program group.
all	Displays changes for all programs.

Defaults

The default is to display predicted changes for all for all route processor (RP) and distributed route processor (DRP) nodes and processes.

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show placement reoptimize** command to display the predicted changes that will occur when the **placement reoptimize** command is run.

Task ID

Task ID	Operations
sysmgr	read

Examples

The following example is of the **show placement reoptimize** command, entered without keywords or arguments:

```
RP/0/RP0/CPU0:router# show placement reoptimize
```

Predicted changes to the placement

Program	Current location	New location
-----	-----	-----
ipv4_rib	0/7/CPU1 (1/14/CPU1)	1/RP0/CPU0 (1/RP1/CPU0)
ipv6_rib	0/7/CPU1 (1/14/CPU1)	1/RP0/CPU0 (1/RP1/CPU0)
brinb instance 81	0/7/CPU1 (1/14/CPU1)	1/RP0/CPU0 (1/RP1/CPU0)
bgp instance 1	0/7/CPU1 (1/14/CPU1)	1/RP0/CPU0 (1/RP1/CPU0)

Related Commands

Command	Description
placement reoptimize	Reoptimizes the processes among the available RPs and DRPs.

show processes

To display information about active processes, use the **show processes** command in administration EXEC or in EXEC mode.

show processes {*job-id* | *process-name* | **abort**s | **all** | **blocked** | **boot** | **cpu** | **distribution** | *process-name* | **dynamic** | **failover** | **family** | **files** | **location** *node-id* | **log** | **mandatory** | **memory** | **pidin** | **searchpath** | **signal** | **startup** | **threadname**} [**location** *node-id*] [**detail**] [**run**]

Syntax Description

<i>job-id</i>	Job identifier for which information for only the process instance associated with the <i>job-id</i> argument is displayed.
<i>process-name</i>	Process name for which all simultaneously running instances are displayed, if applicable.
abort s	Displays process abort information.
all	Displays summary process information for all processes.
blocked	Displays details about reply, send, and mutex blocked processes.
boot	Displays process boot information.
cpu	Displays CPU usage for each process.
distribution	Displays the distribution of processes.
dynamic	Displays process data for dynamically created processes.
failover	Displays process failover information.
family	Displays the process session and family information.
files	Displays information about open files and open communication channels.
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/module</i> notation.
log	Displays process log.
mandatory	Displays process data for mandatory processes.
memory	Displays information about the text, data, and stack usage for processes.
pidin	Displays all processes using the QNX command.
searchpath	Displays the search path.
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.
detail	(Optional) Displays more detail. This option is only available with the <i>process-name</i> argument.
run	(Optional) Displays information for only running processes. This option is only available with the <i>process-name</i> argument.

Defaults

No default behavior or values

Syntax Description

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	The use of this command with no keywords or arguments is not supported.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show processes** command to display general information about the active processes. To display more detailed information for a process, specify a job ID or process for the *job-id* argument or *process-name* argument, respectively.

You can also use the **monitor processes** and **monitor threads** commands to determine the top processes and threads based on CPU usage.

Task ID

Task ID	Operations
basic-services	read

Examples

The **show processes process-name** command displays detailed information about a process:

```
RP/0/RP0/CPU0:router# show processes ospf

      Job Id: 261
      PID: 139453
Executable path: /crs-rout-0.44.0/bin/ospf
Instance #: 1
Version ID: 00.00.0000
  Respawn: ON
  Respawn count: 1
Max. spawns per minute: 12
  Last started: Wed Mar 17 07:46:26 2004
  Process state: Run
  Package state: Normal
Started on config: cfg/gl/ipv4-ospf/proc/100/ord_a/routerid
      core: TEXT SHAREDMEM MAINMEM
```

```

Max. core: 0
Mandatory: ON
Placement: ON
startup_path: /pkg/startup/ospf.startup
Process cpu time: 0.410 user, 0.183 kernel, 0.593 total
JID   TID   LastCPU   Stack   pri   state   HR:MM:SS:MSEC   NAME
261   1     0        40K    10   Receive   0:00:00:0397   ospf
261   2     1        40K    10   Receive   0:00:00:0003   ospf
261   3     0        40K    10   Receive   0:00:00:0007   ospf
261   4     1        40K    10   Condvar   0:00:00:0000   ospf
--More--

```

Table 67 describes the significant fields shown in the display.

Table 67 *show processes Field Descriptions*

Field	Description
Job id	Job ID. This field remains constant over process restarts.
PID	Process ID. This field changes when process is restarted.
Executable path	Path for the process executable.
Instance	There may be more than one instance of a process running at a given time (each instance may have more than one thread).
Version ID	API version.
Respawn	ON or OFF. The field indicates if this process restarts automatically in case of failure.
Respawn count	Number of times this process has been (re)started (that is, the first start makes this count 1).
Max. spawns per minute	Number of respawns not to be exceeded in 1 minute. If this number is exceeded, the process stops restarting.
Last started	Date and time the process was last started.
Process state	Current state of the process.
Started on config	Configuration command that started (or would start) this process.
core	Memory segments to include in core file.
Max. core	Number of times to dump a core file. 0 = infinity.

The **show processes memory** command displays details of memory usage for a given process or for all processes, as shown in the following example:

```
RP/0/RP0/CPU0:router# show processes memory
```

```

JID   Text      Data      Stack     Dynamic   Process
55    28672     4096     69632    17072128 eth_server
164   143360    4096     20480    13238272 crs_fgid_server
317   167936    4096     45056    10526720 syslogd
122   512000    4096     77824     9797632 bgp
265   57344     4096     57344    5877760 parser_server
254   40960     4096     143360   3084288 netio
63    8192      4096     24576    2314240 nvram
314   4096      4096     36864    1699840 sysdb_svr_local
341   495616    4096     40960    1576960 wdsysmon
259   53248     4096     28672    1490944 nvgen_server
189   32768     4096     32768    1425408 hd_drv

```

■ show processes

```

69      77824      4096      110592      1421312      qnet
348     323584     4096     40960      1392640      ospf
347     323584     4096     40960      1392640      ospf
346     323584     4096     40960      1392640      ospf
345     323584     4096     40960      1392640      ospf
344     323584     4096     40960      1392640      ospf
261     323584     4096     40960      1392640      ospf
--More--

```

Table 68 describes the significant fields shown in the display.

Table 68 *show processes memory Field Descriptions*

Field	Description
JID	Job 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.

The show processes command with the **all** keyword displays summary information for all processes as shown in the following example:

```
RP/0/RP0/CPU0:Router# show processes all
```

```

JID      LAST STARTED          STATE    RE-    PLACE-  MANDA-  MAINT-  NAME(IID)  ARGS
          START          START    MENT    TORY    MODE
-----
82      03/16/2007 14:54:52.488 Run      1              M      Y      wd-mbi(1)
58      03/16/2007 14:54:52.488 Run      1              M      Y      dllmgr(1)-r 60 -u 30
74      03/16/2007 14:54:52.488 Run      1              M      Y      pkgfs(1)
57      03/16/2007 14:54:52.488 Run      1              Y      devc-conaux(1) -h -d
librs232.dll -m libconaux.dll -u libst16550.dll
76      03/16/2007 14:54:52.488 Run      1              Y      devc-pty(1) -n 32
56      Not configured      None     0              Y      clock_chip(1) -r -b
--More--

```

Table 69 describes the significant fields shown in the display.

Table 69 *show processes all Field Descriptions*

Field	Description
JID	Job ID.
Last Started	Date when the process was last started.
State	State of the process.
Restart	Number of times the process has restarted since the node was booted. If a node is reloaded, the restart count for all processes is reset. Normally, this value is 1 because usually processes do not restart. However, if you restart a process using the process restart command, the restart count for the process increases by one.

Table 69 *show processes all Field Descriptions (continued)*

Field	Description
Placement	Indicates whether the process is a placeable process or not. Most processes are not placeable, so the value is blank. ISIS, OSPF, and BGP are examples of placeable processes.
Mandatory	M indicates that the process is mandatory. A mandatory process must be running. If for some reason a mandatory process cannot be started (for example, sysmgr starts it but it keeps crashing), after five attempts the sysmgr causes the node to reload in an attempt to correct the problem. A node cannot function properly if a mandatory process is not running.
Maint Mode	Indicates processes that should be running when a node is in maintenance mode. Maintenance mode is intended to run as few processes as possible to perform diagnostics on a card when a problem is suspected. However, even the diagnostics require some services running.
Name (IID)	Name of the process followed by the instance ID. A process can have multiple instances running, so the IID is the instance ID.
Args	Command-line arguments to the process.

Related Commands

Command	Description
monitor processes	Displays interactive auto-updating process statistics in a full-screen mode.
monitor threads	Displays auto-updating process and thread statistics in a full-screen mode.

slow-migration-interval

To set the slow migration interval for the program, use the **slow-migration-interval** command in placement program configuration mode. To return the slow migration interval to its default value, use the **no** form of this command.

slow-migration-interval *length*

no slow-migration-interval

Syntax Description	<i>length</i>	Length of the slow migration interval in seconds.

Defaults	<i>length</i> : 1 second

Command Modes	Placement program configuration

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1.
	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.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

The **placement reoptimize** command identifies processes that must be moved to achieve optimal placement. To prevent disruption on the router, you can use the **slow-migration-interval** command to specify the time to wait after moving each process, to allow the router to recover before preceding to move the next process.

Task ID	Task ID	Operations
	sysmgr	read, write

Examples

The following example shows how to set the slow migration interval:

```
RP/0/RP0/CPU0:router(config)# placement program ipv4_rib
RP/0/RP0/CPU0:router(config-place)# slow-migration-interval 240
```

Related Commands

Command	Description
placement program	Enters placement program configuration mode to set process affinities (preferences).

■ slow-migration-interval



Secure Domain Router Commands on Cisco IOS XR Software

Secure domain routers (SDRs) provide a means of partitioning a router into multiple, independent routers. SDRs perform routing functions in the same manner as a physical router, but share resources with the rest of the system. For example, the applications, configurations, protocols, and routing tables assigned to an SDR belong to that SDR only, but other functions such as chassis control, switch fabric, and partitioning are shared with the rest of the system.

For detailed information about secure domain router concepts, configuration tasks, and examples, refer to the *Configuring Secure Domain Routers on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.



Note

Secure domain routers (SDRs) were previously known as logical routers (LRs). The name was changed for Release 3.3.0.

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 *partially-qualified-nodeid* [**primary**]

no location *partially-qualified-nodeid*

Syntax Description

<i>partially-qualified-nodeid</i>	Node to be assigned to the specified secure domain router. Refer to the Usage Guidelines for the syntax required in each router platform.
primary	(Optional, Cisco CRS-1 only). Configures the node as the DSDRSC for a secure domain router. This keyword is not supported on Cisco XR 12000 Series Routers.

Defaults

All nodes are assigned to the owner SDR.

Command Modes

SDR configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	The term logical router (LR) was changed to secure domain router (SDR). Added support for the primary keyword (optional, Cisco CRS-1 only).
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

Cisco CRS-1 Usage Notes

- Use the **location** command with the **primary** keyword to assign a route processor (RP) pair or a single distributed route processor (DRP) as the DSDRSC. If the **primary** keyword is not used, the node is assigned to the SDR, but it is not the DSDRSC.
- You cannot assign a single RP to an SDR in the Cisco CRS-1. RPs must be added in redundant pairs. The value of the *partially-qualified-nodeid* argument for RPs is entered in the *rack/RP*/** notation. This command assigns the redundant RP pair as the DSDRSC. One RP is automatically elected as the DSDRSC, and the second RP acts as the standby DSDRSC.
- To assign a single DRP to an SDR, use the **location** command with the *partially-qualified-nodeid* argument. To assign a single DRP node as the DSDRSC, enter the **location** command with the *partially-qualified-nodeid* argument and the **primary** keyword.
- To assign a redundant DRP pair to an SDR, use the **pair (SDR)** command as described on [page 589](#). We recommend the use of DRP pairs as the DSDRSC for all non-owner SDRs.
- If an RP is already assigned to the SDR as the DSDRSC, it must be removed before a DRP can be assigned as the DSDRSC.

Cisco XR 12000 Series Router Usage Notes

- Enter the value of the *partially-qualified-nodeid* argument to specify a single node. The value of the *nodeid* argument is entered in the *rack/slot/** notation. Node IDs are always specified at the slot level, so the wildcard (*) is used to specify the CPU.
- The first RP you assign to the SDR will become the DSDRSC. To add a redundant standby RP to the configuration, install a second RP in the adjacent redundancy slot and add it to the SDR configuration. See *Configuring Secure Domain Routers on Cisco IOS XR Software* for information.
- DRPs are not supported in Cisco XR 12000 Series Routers.

Task ID	Task ID	Operations
	system	read, write

Examples**Cisco CRS-1 Router Examples**

In the following example, a new SDR *rname2* is created in a Cisco CRS-1 router. The **location** command is used to add an RP pair as the primary node (DSDRSC). An additional node in rack 1, slot 0 is then added to the configuration.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# location 1/RP/* primary
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# location 1/0/*
```

location (SDR)

```
RP/0/RP0/CPU0:router (admin-config-sdr:rname2)# end
```

The following example shows how to remove a node from SDR *rname2* in a Cisco CRS-1 router:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# no location 1/0/*
RP/0/RP0/CPU0:router (admin-config-sdr:rname2)# end
```

Cisco XR 12000 Series Router Examples

The following example shows how to create an SDR on a Cisco XR 12000 Series Router, and assign RPs in adjacent redundancy slots to be the DSDRSC:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/2/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/3/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# commit
RP/0/0/CPU0:router(admin-config-sdr:rname)# end
```

The following example shows how to add a node to an SDR in a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/5/*
RP/0/0/CPU0:router (admin-config-sdr:rname2)# end
```

The following example shows how to remove a node to an SDR in a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# no location 0/5/*
RP/0/0/CPU0:router (admin-config-sdr:rname2)# end
```

Related Commands

Command	Description
pair (SDR)	Adds or removes a DRP pair from an SDR configuration.
sdr	Creates or modifies an existing secure domain router.

pair (SDR)

To assign a distributed route processor (DRP) pair to a secure domain router (SDR) in a Cisco CRS-1 router, 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* [**primary**]

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> .
primary	(Optional) Specifies the named DRP pair as the primary and standby designated secure domain router system controllers (DSDRSC).

Defaults

No default behavior or values

Command Modes

SDR configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **pair** *pair-name* command to assign a DRP pair to an SDR. Enter the command **pair** *pair-name* and 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.

RPs have 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.

**Note**

This command is not supported on Cisco XR 12000 Series Routers.

Task ID**Task ID Operations**

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 (SDR)	Adds or removes a node from an SDR configuration.
sdr	Creates or modifies an existing secure domain router.
location (drp)	Assigns nodes to a DRP pair.
pairing (drp)	Creates a DRP pair and enters DRP pairing configuration mode.

sdr

To create a secure domain router (SDR) and enter SDR configuration mode, use the **sdr** command in administration configuration mode. To remove a secure domain router from the configuration, use the **no** form of this command.

sdr *sdr-name*

no sdr *sdr-name*

Syntax Description

<i>sdr-name</i>	Name of the SDR to be created or modified.

Defaults

The system comes configured as a single secure domain router known as the *owner SDR*.

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.3.0	The term logical router (LR) was changed to secure domain router (SDR). This command was supported on the Cisco CRS-1.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **sdr** command to create an SDR or modify an existing SDR.



Note

The *sdr-name* argument creates an SDR if the SDR specified for the *sdr-name* argument does not exist.

By default, a router running Cisco IOS XR software contains one SDR, the owner SDR. You cannot create the owner SDR, because it always exists—nor can you completely remove it, because it is necessary for managing the router.

After the **sdr** command is used, the router enters SDR configuration mode. From SDR configuration mode, you can add nodes to the SDR or remove nodes from the SDR using the **location (SDR)** command. In the Cisco CRS-1, you can also add or remove DRP pairs using the **pair (SDR)** command.

Use the **no** form of the command to remove a non-owner SDR configuration. When an SDR is removed from the router configuration, all nodes included in the SDR configuration are returned to the owner SDR inventory. The owner SDR cannot be removed.

Maximum SDR Configurations in Cisco IOS XR Software Release 3.8

- The Cisco CRS-1 supports a maximum of eight SDRs, including one owner SDR and up to seven non-owner SDRs.
- For the Cisco XR 12000 Series Router, we recommend a maximum of four SDRs, including one owner SDR and up to three non-owner SDRs.

Task ID

Task ID	Operations
system	read, write

Examples

The following example shows how to enter SDR configuration mode to configure an SDR. This example is for a Cisco XR 12000 Series Router.

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/0/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/5/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# end
```

The following example shows how to remove an SDR from the configuration. All nodes belonging to the configuration are returned to the owner SDR inventory, and the SDR name is deleted. This example is for a Cisco CRS-1 router.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# no sdr rname
RP/0/RP0/CPU0:router (admin-config)# end
```

Related Commands

Command	Description
location (SDR)	Adds or removes a node from an SDR configuration.
pair (SDR)	Adds or removes a DRP pair from an SDR configuration.
location (drp)	Assigns nodes to a DRP pair.
pairing (drp)	Creates a DRP pair and enters DRP pairing configuration mode.

show sdr

To display information about the currently defined secure domain routers (SDRs), use the **show sdr** command in EXEC mode or administration EXEC mode.

Administration EXEC Mode

```
show sdr [name sdr-name [detail] | summary]
```

EXEC Mode

```
show sdr [detail]
```

Syntax Description

name <i>sdr-name</i>	(Optional. Administration EXEC mode only) Specific SDR.
detail	(Optional) Displays more detailed information for a specific SDR.
summary	(Optional. Administration EXEC mode only) Displays summary information about all SDRs in the system.

Defaults

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

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following example shows sample output from the **show sdr** command in 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 70 describes the significant fields shown in the display.

Table 70 *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.

The following example shows sample output from the **show sdr** command in administration EXEC mode with the **summary** keyword:

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

```
SDRs Configured:
```

SDR-Names	SDRid	dSDRSC	StbydSDRSC	Primary1	Primary2	MacAddr

Owner	0	0/RP0/CPU0	0/RP1/CPU0	0/RP0/CPU0	0/RP1/CPU0	0011.92da.b400
RACK1-RPs	1	1/RP0/CPU0	1/RP1/CPU0	1/RP0/CPU0	1/RP1/CPU0	0011.92da.b401
DRP_ACROSS_RK	2	0/13/CPU0	1/9/CPU0	1/9/CPU0	0/13/CPU0	0011.92da.b402
PRECONFIG-R1	3	NONE	NONE	0/2/CPU0	NONE	0011.92da.b403
R2-PRECONFIG	4	NONE	NONE	0/4/CPU0	NONE	0011.92da.b404

Table 71 describes the significant fields shown in the display.

Table 71 *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.

Related Commands

Command	Description
sdr	Creates or modifies an existing secure domain router.

■ show sdr



SNMP Server Commands on Cisco IOS XR Software

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 *Cisco IOS XR System Management Configuration Guide*.



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, refer to the *Implementing Management Plane Protection on Cisco IOS XR Software* module in *Cisco IOS XR System Security Configuration Guide*.

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 EXEC mode.

clear snmp counters

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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
```

Related Commands	Command	Description
	show snmp	Displays the status of SNMP communications.

index persistence

To enable index persistency 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 arguments or keywords.

Defaults

Index persistency is disabled.

Command Modes

SNMP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Issue 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 ifIndex value for an SNMP interface.
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server ifindex persist	Enables ifIndex persistence globally for all SNMP interfaces.
snmp-server interface	Enables an interface to send SNMP trap notifications and enter SNMP interface configuration mode.

notification linkupdown disable

To disable linkUp and linkDown trap notifications on a Simple Network Management Protocol (SNMP) interface, use the **notification linkupdown disable** command in SNMP interface configuration mode. To enable linkUp and linkDown trap notifications, use the **no** form of this command.

notification linkupdown disable

no notification linkupdown disable

Syntax Description

This command has no arguments or keywords.

Defaults

LinkUp and linkDown trap notifications are enabled.

Command Modes

SNMP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The enable keyword was removed.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

By default, linkUp and linkDown notifications are enabled on physical interfaces. Issue the **notification linkupdown disable** 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.

notification linkupdown disable**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 ifIndex value for an SNMP interface.

[snmp-server engineid](#)

Specifies the identification number of the local SNMP engine.

[snmp-server ifindex persist](#)

Enables ifIndex persistence globally for all SNMP interfaces.

[snmp-server interface](#)

Enables an interface to send SNMP trap notifications and enter SNMP interface configuration mode.

show snmp

To display the status of Simple Network Management Protocol (SNMP) communications, use the **show snmp** command in EXEC mode.

show snmp

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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	The following is 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 72 describes the significant fields shown in the display.

Table 72 *show snmp Field Descriptions*

Field	Description
Chassis	Chassis ID string.
SNMP packets input	Total number of SNMP packets input.
Bad SNMP version errors	Number of packets with an invalid SNMP version.
Unknown community name	Number of SNMP packets with an unknown community name.
Illegal operation for community name supplied	Number of packets requesting an operation not allowed for that community.
Encoding errors	Number of SNMP packets that were improperly encoded.
Number of requested variables	Number of variables requested by SNMP managers.
Number of altered variables	Number of variables altered by SNMP managers.
Get-request PDUs	Number of get requests received
Get-next PDUs	Number of get-next requests received.
Set-request PDUs	Number of set requests received.
SNMP packets output	Total number of SNMP packets sent by the device.
Too big errors	Number of SNMP packets that were larger than the maximum packet size.
Maximum packet size	Maximum size of SNMP packets.
No such name errors	Number of SNMP requests that specified a MIB object that does not exist.
Bad values errors	Number of SNMP set requests that specified an invalid value for a MIB object.
General errors	Number of SNMP set requests that failed due to some other error. (It is not a noSuchName error, badValue error, or any of the other specific errors.)

Table 72 *show snmp Field Descriptions (continued)*

Field	Description
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 the MIB objects 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.

show snmp context

To display all SNMP contexts, use the **show snmp context** command in EXEC mode.

show snmp context

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.8.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

The SNMP agent handles queries based on SNMP contexts created by client features. Use the **show snmp context** command to display all SNMP contexts that were created by clients.

Task ID	Task ID	Operations
	snmp	read

Examples	The following is sample output from the show snmp context command:

```
RP/0/RP0/CPU0:Router# show snmp context

Wed Aug 6 01:42:35.227 UTC
ControlEthernet0_RP0_CPU0_S0
ControlEthernet0_RP1_CPU0_S0
```

Related Commands	Command	Description
	show snmp context-mapping	Displays the SNMP context mapping table.

show snmp context-mapping

To display the SNMP context mapping table, use the **show snmp context-mapping** command in EXEC mode.

show snmp context-mapping

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.8.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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 is 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 73 describes the significant fields shown in the display.

Table 73 *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.

Related Commands

Command	Description
show snmp context	Displays SNMP contexts.

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 EXEC mode.

show snmp engineid

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Use the **show snmp engineid** command to display the identification of the SNMP engine and all remote engines that have been configured on the router.

An SNMP engine is a copy of SNMP that can reside on a local device.

Task ID	Task ID	Operations
	snmp	read

 show snmp engineid

Examples

The following is 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	Specifies the identification number of the local SNMP engine.

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 EXEC mode.

show snmp group

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	snmp	read

Examples	The following is 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
```

show snmp group

```
row status: nonVolatile
```

```
groupname: public security model:snmpv2c
```

```
readview : vldefault writeview: -
```

```
notifyview: vldefault
```

```
row status: nonVolatile
```

[Table 74](#) describes the significant fields shown in the display.

Table 74 *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 an SNMP user group.

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 EXEC mode.

show snmp host

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	snmp	read

Examples	The following is sample output from the show snmp host command:

```
RP/0/RP1/CPU0:Router# show snmp host
```

```
Notification host: 10.50.32.170 udp-port: 2345 type: trap
user: userV3auth security model: v3 auth
```

show snmp host

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 75 describes the significant fields shown in the display.

Table 75 *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.

Related Commands

Command	Description
snmp-server host	Specifies the recipient of an SNMP notification operation.

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 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.
<i>ifindex</i>	(Optional) Displays the ifIndex value for the specifies interface.

Defaults

Enter the **show snmp interface** command without keywords or arguments to display the ifIndex value for all interfaces.

Command Modes

EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
snmp	read

show snmp interface**Examples**

The following 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 76 describes the significant fields shown in the display.

Table 76 *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 enter SNMP interface configuration mode.

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 mode.

show snmp mib [*object-name* | **detailed** | **dll**]

Syntax Description	<i>object-name</i>	(Optional) Specific MIB object identifier or object name.
	detailed	(Optional) Displays a list of all MIBs and corresponding dynamically loadable library (DLL) names on the system.
	dll	(Optional) Displays a list of all MIB DLL filenames and the OID supported by each DLL filename on the system.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	Support was added for the <i>object-name</i> argument.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 is 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--
```

The following is sample output from the **show snmp mib detailed** command:

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--
```

The following is sample output from the **show snmp mib dll** command:

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=mplslpd.mib, loaded
.
.
.
```

Related Commands

Command	Description
show snmp	Displays the status of SNMP communications.

show snmp users

To display information about the configured characteristics of Simple Network Management Protocol (SNMP) users, use the **show snmp users** command in EXEC mode.

show snmp users

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following is 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 77](#) describes the significant fields shown in the display.

Table 77 *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 an SNMP user group.
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 EXEC mode.

show snmp view

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	snmp	read

Examples The following is sample output from the **show snmp view** command:

```
RP/0/RP0/CPU0:Router# show snmp view

view1 1.3 - included nonVolatile active
vldefault 1.3.6.1 - included nonVolatile active
```

Related Commands

Command	Description
snmp-server group	Configures an SNMP user group.
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 global configuration 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.

Defaults

On hardware platforms, where the serial number can be device read, the default is the serial number. For example, some Cisco devices have default chassis ID values of their serial numbers.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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(config)# 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 global configuration 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 community string length is 32 alphanumeric 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 including access to all non-owner SDRs.
	<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.

Defaults

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

Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	The optional keywords LROwner and SystemOwner were added.
	Release 3.4.0	No modification.

Release	Modification
Release 3.5.0	No modification.
Release 3.6.0	LROwner was changed to SDROwner . The clear and encrypted keywords were added.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 command **snmp-server community** is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the command **snmp-server community** is entered with the **SystemOwner** keyword, SNMP access is granted to all SDRs in the system.



Note

In a non-owner SDR, a community name provides access only to the object instances that belong to that SDR, regardless of the access privilege assigned to the community name. Access to the owner SDR and system-wide access privileges are available only from the owner SDR.



Note

Secure domain routers (SDRs) were previously known as logical routers (LRs). The name was changed as of Cisco IOS XR Release 3.3.0.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following 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
```

The following 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 a 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 global configuration 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-name</i>	Name of the community.
context <i>context-name</i>	Name of the SNMP context to which this community name is to be mapped.
security-name <i>security-name</i>	Security name for this community. By default, the <i>community-name</i> is the security name.
target-list <i>target</i>	Name of the target list for this community.

Defaults

The value of the *community-string* argument is also the security name.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following 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 an 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 global configuration 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.

Defaults	<i>No system contact is set.</i>

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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

The following 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	Sets the system location string.

snmp-server context

To create a Simple Network Management Protocol (SNMP) context, use the **snmp-server context** command in global configuration 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.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following 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 VRF properties of SNMP.

snmp-server engineid

To specify Simple Network Management Protocol (SNMP) engine ID on the local device, use the **snmp-server engineid local** command in global configuration 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 (:).

Defaults

An SNMP engine ID is generated automatically.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following 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 information about the local SNMP engine.

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 global configuration 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.

Defaults

See [Table 78](#) in the “Usage Guidelines” section.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The access keyword was removed.

Release	Modification
Release 3.3.0	Support was added for the context <i>context-name</i> keyword and argument.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Table 78 describes the default values for the different views.

Table 78 *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 information about each SNMP group on the network.
	snmp-server host	Specifies the recipient of an SNMP notification operation.
	snmp-server view	Creates or updates a 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 global configuration mode. To remove the specified host, use the **no** form of this command.

snmp-server host *address* [**clear** | **encrypted**] [**traps**] [**version** { **1** | **2c** | **3** { **auth** | **noauth** | **priv** } }]
community-string [**udp-port** *port*] [*notification-type*]

no snmp-server host *address* [**clear** | **encrypted**] [**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.
traps	(Optional) Specifies that notifications should be sent as traps. This is the default.
version { 1 2c 3 { auth noauth priv } }	(Optional) Specifies the version of the SNMP used to send the traps. The default is SNMPv1. Version 3 is the most secure model, because it allows packet encryption with the priv keyword. When the version keyword is used, one of the following keywords must be specified: • 1—Specifies SNMPv1. • 2c—Specifies SNMPv2C. • 3—Specifies SNMPv3. If you specify the SNMPv3 3 optional keyword, you must specify the security level using one of the following required keywords: – 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”). If you do specify a security level, the default is noauth.
<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 the following 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.

Defaults

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

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 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 **snmp-server host** command with the **traps** keyword is entered for the same host, the second command replaces the first.

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.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following 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
```

The following 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
```

The following 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
```

The following 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
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server ifindex persist

To enable ifIndex persistence globally on all Simple Network Management Protocol (SNMP) interfaces, use the **snmp-server ifindex persist** command in global configuration mode. To disable global interface persistence, use the **no** form of this command.

snmp-server ifindex persist

no snmp-server ifindex persist

Syntax Description

This command has no arguments or keywords.

Defaults

Global interface persistence is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server ifindex persist** command to enable ifIndex persistence on all interfaces that have entries in the ifIndex table of the IF-MIB. When enabled, this command retains the mapping between the ifName object values and the ifIndex object values (generated from the IF-MIB) persistent during reloads, allowing for consistent identification of specific interfaces using SNMP. Applications such as device inventory, billing, and fault detection depend on this feature.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to enable ifIndex persistence globally:

```
RP/0/RP0/CPU0:Router(config)# snmp-server ifindex persist
```

Related Commands

Command	Description
index persistence	Enables ifIndex persistence for an SNMP interface.
notification linkupdown disable	Disables linkUp and linkDown notifications for an SNMP interface.
show snmp interface	Displays the ifIndex value for an SNMP interface.

snmp-server ifmib ifalias long

To enable the ifAlias IF-MIB object to accept an interface alias name that exceeds the 64-byte default, use the **snmp-server ifmib ifalias long** command. Use the **no** form of this command to revert to the default length.

snmp-server ifmib ifalias long

no snmp-server ifmib ifalias long

Syntax Description

This command has no arguments or keywords.

Defaults

Global interface persistence is disabled.
The alias name is 64 bytes in length.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server ifmib ifalias long** command to enable the IF-MIB object ifAlias to accept an interface alias name that is greater than 64 bytes in length. The default length for the alias name is 64 bytes.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to enable the IF-MIB object ifAlias:

```
RP/0/RP0/CPU0:Router(config)# snmp-server ifmib ifalias long
RP/0/RP0/CPU0:Router(config)# exit
Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes
RP/0/RP0/CPU0:Router#
```

snmp-server ifmib stats cache

To enable retrieval of cached statistics instead of real-time statistics, use the **snmp-server ifmib stats cache** command. To revert to the default, use the **no** form of this command.

snmp-server ifmib stats cache

no snmp-server ifmib stats cache

Syntax Description This command has no arguments or keywords.

Defaults Cached statistics are not enabled.

Command Modes Global configuration

Command History

Release	Modification
Release 3.3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.4.0	This command was not supported.
Release 3.5.0	This command was supported on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Cisco IOS XR statistics infrastructure maintains a cache of statistics for all interfaces. This cache is updated every 30 seconds. Use the **snmp-server ifmib stats cache** command to enable the IF-MIB to retrieve these cached statistics rather than real-time statistics. Accessing cached statistics is less CPU-intensive than accessing real-time statistics.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to enable the IF-MIB caches statistics:

```
RP/0/RP0/CPU0:Router(config)# snmp-server ifmib stats cache
RP/0/RP0/CPU0:Router(config)# exit
Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes
RP/0/RP0/CPU0:Router#
```

snmp-server interface

To enable an interface to send Simple Network Management Protocol (SNMP) trap notifications and enter SNMP interface configuration mode, use the **snmp-server interface** command in global configuration mode. To disable the sending of SNMP trap notifications on an interface, use the **no** form of this command.

snmp-server interface *type interface-path-id*

no snmp-server interface *type interface-path-id*

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.	

Defaults	Ethernet interfaces are enabled to send SNMP trap notifications. SNMP trap notifications are disabled on all other physical and logical interfaces.

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
		The ifindex , clear , persist , enable , and trap link-status keywords were removed.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **snmp-server interface** command enters SNMP interface configuration mode for you to configure the available SNMP options.



Note

In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0.

Example: interface MgmtEth0/RP1/CPU0/0.

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)#
```

Related Commands

Command	Description
show snmp interface	Displays the ifIndex value for an SNMP interface.
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server ifindex persist	Enables ifIndex persistence globally for all SNMP interfaces.

snmp-server ipv4 dscp

To mark packets with a specific differentiated services code point (DSCP) value, use the **snmp-server ipv4 dscp** command in global configuration mode. To remove matching criteria, use the **no** form of this command.

snmp-server ipv4 dscp *value*

no snmp-server ipv4 dscp [*value*]

Syntax Description

<i>value</i>	Value of the DSCP. The DSCP value can be a number from 0 to 63, or it can be one of the following keywords: default , ef , af11 , af12 , af13 , af21 , af22 , af23 , af31 , af32 , af33 , af41 , af42 , af43 , cs1 , cs2 , cs3 , cs4 , cs5 , cs6 , or cs7 .

Defaults

The IP DSCP default value for SNMP traffic is 0.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server ipv4 dscp** command to specify an IP DSCP value to give SNMP traffic higher or lower priority in your network.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to configure the DSCP value to af32:

```
RP/0/RP0/CPU0:router(config)# snmp-server ipv4 dscp af32
```

snmp-server ipv4 precedence

To mark packets with a specific precedence level to use for packet matching, use the **snmp-server ipv4 precedence** command in global configuration mode. To restore the system to its default interval values, use the **no** form of this command.

snmp-server ipv4 precedence *value*

no snmp-server ipv4 precedence [*value*]

Syntax Description

value

Value of the precedence. The precedence value can be a number from 0 to 7, or it can be one of the following keywords:

- **critical**—Set packets with critical precedence (5)
- **flash**—Set packets with flash precedence (3)
- **flash-override**—Set packets with flash override precedence (4)
- **immediate**—Set packets with immediate precedence (2)
- **internet**—Set packets with internetwork control precedence (6)
- **network**—Set packets with network control precedence (7)
- **priority**—Set packets with priority precedence (1)
- **routine**—Set packets with routine precedence (0)

Defaults

The IP Precedence default value for SNMP traffic is 0.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server ipv4 precedence** command to specify an IP Precedence value to give SNMP traffic higher or lower priority in your network.

■ snmp-server ipv4 precedence

Task ID	Task ID	Operations
	snmp	read, write

Examples

The following example shows how to set the precedence to 2:

```
RP/0/RP0/CPU0:router(config)# snmp-server ipv4 precedence 2
```

snmp-server location

To specify the system location for Simple Network Management Protocol (SNMP), use the **snmp-server location** command in global configuration 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.

Defaults	<i>No system location string is set.</i>

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	snmp	read, write

Examples	The following example shows how to specify a system location string: RP/0/RP0/CPU0:Router(config)# snmp-server location Building 3/Room 214

 snmp-server location**Related Commands**

Command	Description
snmp-server contact	Sets the system contact string.

snmp-server notification-log-mib

To configure the NOTIFICATION-LOG-MIB, use the **snmp-server notification-log-mib** command in global configuration 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 <i>minutes</i> can range from 0 to 4294967295.
globalSize <i>size</i>	Specifies the maximum number of notifications that can be logged in all logs.
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.

Defaults

globalAgeOut *time*: 15
globalSize *size*: 500
size *size*: 500

Command Modes

Global configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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
```

The following example removes the default log:

```
RP/0/RP0/CPU0:Router(config)# no snmp-server notification-log-mib default
```

The following 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 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 global configuration 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.

Defaults	<i>size</i> : 1500

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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

The following 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 global configuration 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 1000.

Defaults	<i>length</i> : 10

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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, the 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

The following 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 an Simple Network Management Protocol (SNMP) target list, use the **snmp-server target list** command in global configuration mode. To remove a 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 IPv4 address.

Defaults

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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).

Task ID

Task ID	Operations
snmp	read, write

Examples

The following 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 global configuration 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 msec. Values can be from 50 to 1000 msec.

Defaults	<i>time</i> : 0

Command Modes	Global configuration

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Task ID	Task ID	Operations
	snmp	read, write

Examples	In the following example, the throttle time is set to 500 msec: 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 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 global configuration 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, in seconds, used by the SNMP agent when waiting for a response from a MIB module. The default is 10 seconds.

Defaults	<i>timeout</i> : 10 seconds

Command Modes	Global configuration

Command History	Release	Modification
	Release 3.8.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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 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 global configuration mode. To restore the default value, use the **no** form of this command.

snmp-server trap link ietf

no snmp-server trap link ietf

Syntax Description

This command has no arguments or keywords.

Defaults

The default varbind used is cisco.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following example shows how to enable the RFC 2863 standard varbind:

```
RP/0/RP0/CPU0:Router(config)# snmp-server trap link ietf
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps

To enable Simple Network Management Protocol (SNMP) trap notifications, use the **snmp-server traps** command in global configuration 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

<i>notification-type</i>	(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. • 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 bundle—Enables SNMP fabric bundle traps. • fabric plane—Enables SNMP fabric plane state-change traps. • flash insertion—Enable ciscoFlashDeviceInsertedNotif. • flash removal—Enable 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.
- **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.
- **vpls**—Enables virtual private LAN service (VPLS) traps.

Note To display the trap notifications supported on a platform, use the online help (?) function.

Defaults

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The enable keyword was removed from the command name.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	The flash , ipsec , l2vpn , and mpls traps were introduced.
Release 3.6.0	The RF-MIB trap was introduced.
Release 3.7.0	No modification.
Release 3.8.0	The bfd keyword was introduced.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server traps** command to enable trap requests for the specified notification types. To configure the router to send SNMP notifications, specify at least one **snmp-server traps** command. When the command is entered with no keyword, all notification types are enabled. When a notification type keyword is specified, only the notification type related to that keyword is enabled. To enable multiple types of notifications, issue a separate **snmp-server traps** command for each notification type.

More information about individual MIBs can be found in the SNMP Object Navigator, available through cisco.com at <http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2>.

The **snmp-server traps** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

Some SNMP trap notifications require additional Task IDs as indicated in the following table:

Notification Type	Task ID	Operations
bfd	bgp	read, write
	ospf	read, write
	isis	read, write
	mpls-te	read, write
	snmp	read, write
bgp	bgp	read, write
copy-complete	config-services	read, write
ipsec	crypto	read, write
isakmp	crypto	read, write
l2vpn	l2vpn	read, write
mpls frr	mpls-ldp	read, write
	mpls-te	read, write
mpls l3vpn	ipv4	read, write
	mpls-ldp	read, write
	mpls-te	read, write
mpls ldp	mpls-ldp	read, write
	mpls-te	read, write
mpls traffic-eng	mpls-ldp	read, write
	mpls-te	read, write
ospf	ospf	read, write
syslog	sysmgr	read, write
vpls	l2vpn	read, write

Examples

The following 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 an SNMP notification operation.
	snmp-server traps bgp	Enables BGP server state-change SNMP notifications.
	snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
	snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps bgp

To enable Border Gateway Protocol (BGP) state-change Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps bgp** command in global configuration mode. To disable BGP state-change SNMP notifications, use the **no** form of this command.

snmp-server traps bgp

no snmp-server traps bgp

Syntax Description

This command has no arguments or keywords.

Defaults

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The enable keyword was removed from the command name.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

SNMP notifications can be sent as traps.

Use the **snmp-server traps bgp** command to enable or disable BGP server state-change notifications, as defined in the BGP4-MIB (enterprise 1.3.6.1.2.1.15.7). The notifications types are:

- bgpEstablished
- bgpBackwardTransition

The BGP notifications are defined in the BGP-4 MIB as follows:

```
bgpTraps                OBJECT IDENTIFIER ::= { bgp 7 }
```

```

bgpEstablished NOTIFICATION-TYPE
    OBJECTS { bgpPeerLastError,
              bgpPeerState      }
    STATUS   current
    DESCRIPTION
        "The BGP Established event is generated when the BGP FSM enters the ESTABLISHED
        state."
    ::= { bgpTraps 1 }

bgpBackwardTransition NOTIFICATION-TYPE
    OBJECTS { bgpPeerLastError,
              bgpPeerState      }
    STATUS   current
    DESCRIPTION
        "The BGPBackwardTransition Event is generated when the BGP FSM moves from a higher
        numbered state to a lower numbered state."
    ::= {bgpTraps 2}

```

For a complete description of these notifications and additional MIB functions, see the BGP4-MIB in the SNMP Object Navigator, available through [cisco.com](http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2) at <http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2>.

The **snmp-server traps bgp** 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
	bgp	read, write

Examples

The following example shows how to enable the router to send BGP state-change 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 bgp
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public

```

Related Commands	Command	Description
	snmp-server engineid	Specifies the identification number of the local SNMP engine.
	snmp-server host	Specifies the recipient of an SNMP notification operation.
	snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
	snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps mpls l3vpn

To enable the sending of MPLS Layer 3 VPN Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps mpls l3vpn** command in global configuration mode. To disable MPLS Layer 3 VPN SNMP notifications, use the **no** form of this command.

snmp-server traps mpls l3vpn { **all** | **max-threshold-cleared** | **max-threshold-exceeded** | **max-threshold-reissue-notif-time** | **mid-threshold-exceeded** | **vrf-down** | **vrf-up** }

no snmp-server traps mpls l3vpn

Syntax Description

all	Enables all MPLS Layer 3 VPN traps.
max-threshold-cleared	Enables maximum threshold cleared traps.
max-threshold-exceeded	Enables maximum threshold exceeded traps.
max-threshold-reissue-notif-time <i>seconds</i>	Specifies the time interval, in seconds, for reissuing a maximum threshold notification.
mid-threshold-exceeded	Enables mid-threshold exceeded traps.
vrf-down	Enables VRF down traps.
vrf-up	Enables VRF up traps.

Defaults

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	snmp	read, write

Examples

The following example shows how to enable the device to send MPLS Layer 3 VPN traps:

```
RP/0/RP0/CPU0:Router(config)# snmp-server traps mpls l3vpn all
```

Related Commands

Command	Description
snmp-server traps	Enables SNMP trap notifications.

snmp-server traps ospf errors

To enable Open Shortest Path First (OSPF) error Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps errors** command in global configuration mode. To disable OSPF error SNMP notifications, use the **no** form of this command.

snmp-server traps ospf errors {authentication-failure | bad-packet | config-error | virt-authentication-failure | virt-bad-packet | virt-config-error}

no snmp-server traps ospf errors {authentication-failure | bad-packet | config-error | virt-authentication-failure | virt-bad-packet | virt-config-error}

Syntax Description

authentication-failure	Enables SNMP traps for authentication failure errors on physical interfaces.
bad-packet	Enables SNMP traps for bad packet errors on physical interfaces.
config-error	Enables SNMP traps for configuration errors on physical interfaces.
virt-authentication-failure	Enables SNMP traps for authentication failure errors on virtual interfaces.
virt-bad-packet	Enables SNMP traps for bad packet errors on virtual interfaces.
virt-config-error	Enables SNMP traps for configuration errors on virtual interfaces.

Defaults

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

SNMP notifications can be sent as traps.

For a complete description of OSPF error notifications and additional MIB functions, see the OSPF-TRAP-MIB 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 ospf errors** 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 the router to send OSPF error 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 ospf errors
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps ospf lsa

To enable Open Shortest Path First (OSPF) link-state advertisement Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps ospf lsa** command in global configuration mode. To disable OSPF link state SNMP notifications, use the **no** form of this command.

snmp-server traps ospf lsa {lsa-maxage | lsa-originate}

no snmp-server traps ospf lsa {lsa-maxage | lsa-originate}

Syntax Description

lsa-maxage	Enables SNMP traps for link-state advertisement maxage.
lsa-originate	Enables SNMP traps for new link-state advertisement origination.

Defaults

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

SNMP notifications can be sent as traps.

For a complete description of OSPF link-state advertisement notifications and additional MIB functions, see the OSPF-TRAP-MIB in the SNMP Object Navigator, available through [cisco.com](http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2) at <http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2>.

The **snmp-server traps ospf lsa** 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 the router to send OSPF link-state advertisement 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 ospf lsa lsa-maxage  
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps ospf retransmit

To enable Open Shortest Path First (OSPF) retransmission Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps ospf retransmit** command in global configuration mode. To disable OSPF retransmission SNMP notifications, use the **no** form of this command.

snmp-server traps ospf retransmit {packets | virt-packets}

no snmp-server traps ospf retransmit {packets | virt-packets}

Syntax Description

packets	Enables SNMP traps for packet retransmissions on physical interfaces.
virt-packets	Enables SNMP traps for packet retransmissions on virtual interfaces.

Defaults

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

SNMP notifications can be sent as traps.

For a complete description of OSPF retransmission notifications and additional MIB functions, see the OSPF-TRAP-MIB 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 ospf retransmit** 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 the router to send OSPF retransmission 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 ospf retransmit packets
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps ospf state-change neighbor-state-change

To enable Simple Network Management Protocol (SNMP) notifications for Open Shortest Path First (OSPF) neighbor state change, use the **snmp-server traps ospf state-change neighbor-state-change** command in global configuration mode. To disable OSPF state-change SNMP notifications, use the **no** form of this command.

snmp-server traps ospf state-change neighbor-state-change

no snmp-server traps ospf state-change neighbor-state-change

Syntax Description This command has no arguments or keywords.

Defaults SNMP notifications are disabled by default.

Command Modes Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

SNMP notifications can be sent as traps.

Use the **snmp-server traps ospf state-change neighbor-state-change** command to enable or disable OSPF server state-change notifications, as defined in the MIB. One notification types is:

- ospfNbrStateChange

For example, the OSPF ospfNbrStateChange notification is defined in the OSPF MIB as follows:

```
!      ospfNbrStateChange NOTIFICATION-TYPE
!      OBJECTS {
!          ospfRouterId, -- The originator of the trap
!          ospfNbrIpAddr,
!          ospfNbrAddressLessIndex,
!          ospfNbrRtrId,
```

```
!               ospfNbrState  -- The new state
!               }
!       STATUS               current
```

For a complete description of these notifications and additional MIB functions, see the OSPF-TRAP-MIB 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 ospf state-change neighbor-state-change** 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 the router to send OSPF state-change 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 ospf state-change neighbor-state-change
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps pim interface-state-change

To enable Protocol Independent Multicast (PIM) interface status notification, use the **snmp-server traps pim interface-state-change** command in global configuration mode. To disable this command so no notification is sent, use the **no** form of this command.

snmp-server traps pim interface-state-change

no snmp-server traps pim interface-state-change

Syntax Description

This command has no arguments or keywords.

Defaults

Simple Network Management Protocol (SNMP) notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Use the **snmp-server traps pim interface-state-change** command to send notifications when a PIM interface changes status from up to down. When the status is up, the notification signifies the restoration of a PIM interface. When the status is down, the notification signifies the loss of a PIM interface.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at <http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2>.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to use the **snmp-server traps pim interface-state-change** command:

```
RP/0/RP0/CPU0:Router(config)# snmp-server traps pim interface-state-change
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps pim invalid-message-received	Enables notifications for monitoring invalid PIM protocol operations.
snmp-server traps pim neighbor-change	Enables PIM neighbor status down notifications.
snmp-server traps pim rp-mapping-change	Enables notifications indicating a change in the rendezvous point (RP) mapping information due to either Auto-RP or bootstrap router (BSR) messages.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notification for Cisco-syslog-MIB error messages.

snmp-server traps pim invalid-message-received

To enable notifications for monitoring invalid Protocol Independent Multicast (PIM) protocol operations, such as invalid register received and invalid join or prune received, use the **snmp-server traps pim invalid-message-received** command in global configuration mode. To disable this command so that no notification is sent, use the **no** form of this command.

snmp-server traps pim invalid-message-received

no snmp-server traps pim invalid-message-received

Syntax Description This command has no arguments or keywords.

Defaults Simple Network Management Protocol (SNMP) notifications are disabled by default.

Command Modes Global configuration

Command History

Release	Modification
Release 3.3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

A router can receive a join or prune message in which the RP specified in the packet is not the RP for the multicast group. Or a router can receive a register message from a multicast group in which it is not the RP.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at <http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2>.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to use the **snmp-server traps pim invalid-message-received** command:

```
RP/0/RP0/CPU0:Router(config)# snmp-server traps pim invalid-message-received
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps pim interface-state-change	Enables PIM interface status notification.
snmp-server traps pim neighbor-change	Enables PIM neighbor status down notifications.
snmp-server traps pim rp-mapping-change	Enables notifications indicating a change in the rendezvous point (RP) mapping information due to either Auto-RP or bootstrap router (BSR) messages.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notification for Cisco-syslog-MIB error messages.

snmp-server traps pim neighbor-change

To enable Protocol Independent Multicast (PIM) neighbor status down notifications, use the **snmp-server traps pim neighbor-change** command in global configuration mode. To disable PIM neighbor down notifications, use the **no** form of this command.

snmp-server traps pim neighbor-change

no snmp-server traps pim neighbor-change

Syntax Description

This command has no arguments or keywords.

Defaults

PIM Simple Network Management Protocol (SNMP) notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **snmp-server traps pim neighbor-change** command to send notifications when a PIM neighbor changes status from up to down on an interface. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at <http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2>.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to enable the router to send PIM neighbor status down 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 pim neighbor-change
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps pim interface-state-change	Enables PIM interface status notification.
snmp-server traps pim invalid-message-received	Enables notifications for monitoring invalid PIM protocol operations.
snmp-server traps pim rp-mapping-change	Enables notifications indicating a change in the rendezvous point (RP) mapping information due to either Auto-RP or bootstrap router (BSR) messages.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for Cisco-syslog-MIB error messages.

snmp-server traps pim rp-mapping-change

To enable notifications indicating a change in the rendezvous point (RP) mapping information due to either Auto-RP or bootstrap router (BSR) messages, use the **snmp-server traps pim rp-mapping-change** command in global configuration mode. To disable this command so no notification is sent, use the **no** form of this command.

snmp-server traps pim rp-mapping-change

no snmp-server traps pim rp-mapping-change

Syntax Description This command has no arguments or keywords.

Defaults PIM SNMP notifications are disabled by default.

Command Modes Global configuration

Command History

Release	Modification
Release 3.3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the [snmp-server host](#) command to specify which host or hosts receive SNMP notifications.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at <http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2>.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following example shows how to use the **snmp-server traps pim rp-mapping-change** command:

```
RP/0/RP0/CPU0:Router(config)# snmp-server traps pim rp-mapping-change
RP/0/RP0/CPU0:Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Commands

Command	Description
snmp-server engineid	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps pim interface-state-change	Enables PIM interface status notification.
snmp-server traps pim invalid-message-received	Enables notifications for monitoring invalid PIM protocol operations.
snmp-server traps pim neighbor-change	Enables PIM neighbor status down notifications.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notification for 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 global configuration mode. To disable RFC 1157 SNMP notifications, use the **no** form of this command.

snmp-server traps snmp [authentication]

no snmp-server traps snmp [authentication]

Syntax Description	authentication (Optional) Controls the sending of SNMP authentication failure notifications.

Defaults	SNMP notifications are disabled by default.

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The enable keyword was removed from the command name.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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.

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.

Task ID	Task ID	Operations
	snmp	read, write

Examples

The following 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/0/0/1:Router (config)# snmp-server traps snmp authentication
RP/0/0/1:Router (config)# snmp-server host myhost.cisco.com public snmp
```

Related Commands	Command	Description
	snmp-server engineid	Specifies the identification number of the local SNMP engine.
	snmp-server host	Specifies the recipient of an SNMP notification operation.
	snmp-server traps bgp	Enables BGP server state-change SNMP notifications.
	snmp-server traps syslog	Enables SNMP notifications for 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 global 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 arguments or keywords.

Defaults

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The enable keyword was removed from the command name.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps bgp	Enables BGP server state-change SNMP notifications.
snmp-server traps snmp	Enables 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 global configuration 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.

Defaults	No interface is specified.

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

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 alphanumeric (RP0 or RP1) and the module is CPU0.
Example: interface MgmtEth0/RP1/CPU0/0.

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	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for 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 global configuration 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 (in seconds) for resending the messages. Value can be from 1 to 1000.

Defaults	<i>seconds</i> : 30

Command Modes	Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Before the 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	Specifies the identification number of the local SNMP engine.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server traps bgp	Enables BGP state-change SNMP notifications.
snmp-server traps snmp	Enables RFC 1157 SNMP notifications.
snmp-server traps syslog	Enables SNMP notifications for 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 global configuration 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 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 {md5 sha} {clear encrypted} auth-password	(Optional) Specifies which authentication level should be used. If you specify the auth keyword, you must specify the an authentication level with one of the following keywords: md5—Specifies the HMAC-MD5-96 authentication level. sha—Specifies the HMAC-SHA-96 authentication level. After you specify the authentication level, you must specify an authorization password. Before setting the authorization password, you must specify one of the following required keywords: clear—Specifies that an unencrypted password follows. encrypted—Specifies that an encrypted password follows. After specifying the type of password, specify the authentication password for the <i>auth-password</i> argument: <i>auth-password</i>—String (not to exceed 64 characters) that enables the agent to receive packets from the host.
priv des56 {clear encrypted} priv-password	(Optional) Specifies the 56-bit Data Encryption Standard (DES) level of encryption for the user. After you specify encryption parameters for the user, you must specify a privacy password. Before setting the privacy password, you must specify one of the following required keywords: clear—Specifies that an unencrypted password follows. encrypted—Specifies that an encrypted password follows. After specifying the type of privacy password that follows, specify the privacy password for the <i>priv-password</i> argument: <i>priv-password</i>—Unencrypted, clear-text privacy password.
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) Specifies an access list to be associated with this SNMP user. The <i>list</i> argument represents a value from 1 to 99, that is, the identifier of the standard IP access list.

Defaults

By default, access is limited to agents on the owner SDR only.

See also [Table 79](#) in the “Usage Guidelines” section.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The access keyword was removed. The 0 and 7 keywords were replaced by the clear and encrypted keywords, respectively.
Release 3.3.0	Optional keywords LROwner and SystemOwner were added
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	LROwner was changed to SDROwner .
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

[Table 79](#) describes default behaviors for passwords and access lists.

Table 79 *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 command **snmp-server user** is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the command **snmp-server user** is entered with the **SystemOwner** keyword, SNMP access is granted to all SDRs in the system.

**Note**

In a non-owner SDR, user access is provided only to the object instances in that SDR, regardless of the access privilege assigned. Access to the owner SDR and system-wide access privileges are available only from the owner SDR.

**Note**

Secure domain routers (SDRs) were previously known as logical routers (LRs). The name was changed as of Cisco IOS XR Release 3.3.0.

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, issue 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.

The following 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 an SNMP user group.

snmp-server view

To create or update a Simple Network Management Protocol (SNMP) view entry, use the **snmp-server view** command in global configuration 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.

Defaults

No view entry exists.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 the Cisco IOS XR software, however, do not match the predefined views specified in RFC 3415.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following 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
```

The following 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
```

The following 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 information about the configured views.
snmp-server group	Configures an SNMP user group.

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 global configuration 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 the following 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>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.

Defaults No default behavior or values

Command Modes Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use this command to enter SNMP VRF configuration submode 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.

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 submode. This context must be created using **snmp-server context** command.

Task ID

Task ID	Operations
snmp	read, write

Examples

The following 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 an SNMP context.
snmp-server host	Specifies the recipient of an SNMP notification operation.



Software Entitlement Commands on Cisco IOS XR Software

For detailed information about software entitlement concepts, configuration tasks, and examples, refer to the *Software Entitlement on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

clear license

To delete all licenses from the router persistent storage, use the **clear license** command in administration EXEC mode.

clear license

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **clear license** command removes all licenses from the router persistent storage.

Task ID	Task ID	Operations
	pkg-mgmt	execute

Examples In the following example, all licenses are removed from the router:

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

clear license log

To clear the operational or administrative logs for the license system, use the **clear license log** command in administration EXEC mode.

clear license log {operational | administration}

Syntax Description

operational	Clears the operational logs for the license system.
administration	Clears the administration logs for the license system.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **clear license log** command to clear either the operational or administrative logs for the license system. To view the logs, use the **show license log** command. The license log does not persist between reloads.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example illustrates how to use the **clear license log** command to clear the operational logs:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# clear license log operational
```

**Related Commands**

Command	Description
show license log	Displays the operational or administrative logs for the license system.

hw-module linecard throughput (Cisco XR 12000 Series Router)

To configure the throughput for a Cisco XR 12000 SIP-401 or Cisco XR 12000 SIP-501, use the **hw-module linecard throughput** command in global configuration mode. To revert to the default linecard throughput, use the **no** form of this command.

hw-module linecard throughput location *node-id* *throughput*

no hw-module linecard throughput location *node-id*

Syntax Description

location <i>node-id</i>	Specifies the node to configure. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
<i>throughput</i>	Specifies the throughput, in Gbps, at which the SIP should operate.

Defaults

The default throughput for the Cisco XR 12000 SIP-501 is 5 Gbps.
The default throughput for the Cisco XR 12000 SIP-401 is 2.5 Gbps.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The default throughput for the Cisco XR 12000 SIP-401 is 2.5 Gbps; for the Cisco XR 12000 SIP-501 is 5 Gbps. To raise the allowable throughput of your SIP to a maximum of 10 Gbps, you must have an available license on the router, and use the **hw-module linecard throughput** command.

You can configure a Cisco XR 12000 SIP-401 to run at 5 Gbps, using a single 2.5 G to 5 G license. You can configure the Cisco XR 12000 SIP-401 to run at 10 Gbps, using a single 2.5 G to 10 G license, or using a 2.5 G to 5 G license together with a 5 G to 10 G license. A Cisco XR 12000 SIP-501 can be configured to run at 10 Gbps, using a single 5 G to 10 G license. A Cisco XR 12000 SIP cannot be configured to run at a rate less than its default rate.

You should install permanent licenses for all SIPs that you want to operate at an increased throughput. Refer to the *Software Entitlement on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

hw-module linecard throughput (Cisco XR 12000 Series Router)

Task ID	Task ID	Operations
	interface	read, write

Examples

The following example shows how to configure a SIP to operate at 10 Gbps:

```
RP/0/0/CPU0:router# configure  
RP/0/0/CPU0:router(config)# hw-module linecard throughput location 0/6/CPU0 10g
```

Related Commands	Command	Description
	show hw-module linecard throughput	Displays the throughput of all nodes in the router.

hw-module linecard throughput (CRS-1)

To configure the throughput for a modular services card (MSC), use the **hw-module linecard throughput** command in global configuration mode. To revert to the default throughput, use the **no** form of this command.

hw-module linecard throughput { 20g | 40g } location *node-id*

no hw-module linecard throughput { 20g | 40g } location *node-id*

Syntax Description

20g 40g	Specifies whether the node should operate at 40 Gbps or 20 Gbps.
location <i>node-id</i>	Specifies the node to configure. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.

Defaults

The default throughput is 20 Gbps.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The default throughput is 20 Gbps. If you upgrade your release from one that does not support software entitlement to one that does, and you have MSCs in your router operating at 40 Gbps, an implicit license is added to your router so that you can continue to operate at 40 Gbps for a limited period of time. You must, however, use the **hw-module linecard throughput** command to enable the MSC throughput to 40 Gbps. Otherwise, your cards continue to operate at 20 Gbps.

Implicit licenses expire after a set period of time. You should install permanent licenses for all MSCs that you want to operate at 40 Gbps. Refer to the *Software Entitlement on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

Task ID

Task ID	Operations
interface	read, write

hw-module linecard throughput (CRS-1)**Examples**

The following example shows how to configure a node to operate at 40 Gbps:

```
RP/0/0/CPU0:router# configure  
RP/0/0/CPU0:router(config)# hw-module linecard throughput 40 location 0/6/0
```

Related Commands

Command	Description
show hw-module linecard throughput	Displays the throughput of all nodes in the router.

license add

To add a license to a secure domain router (SDR) license pool, use the **license add** command in administration EXEC mode.

license add *license-name* [**sdr** *sdr-name*]

Syntax Description

<i>license-name</i>	Name and location of the license file to be added. The license file can be local to the system or a remote file on a TFTP server.
sdr <i>sdr-name</i>	(Optional) Adds the license to the specified SDR license pool. The default is owner. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults

License is added to the owner SDR.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **license add** command to add a license to an SDR license pool. The license file can be local to the system or a remote file on a TFTP server. The license file is stored in persistent storage on the router.

To acquire a license file, you must provide a manufacturing supplied product authorization key (PAK) and the license unique device identifier (UDI) of the chassis to the license registration tool located at the following URL: <https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet>. To obtain the UDI of your chassis, use the **show license udi** command.

By default, there is one license pool available. You can create specific license pools using the **license pool create** command. If a license is available for a specific SDR license pool, it cannot be used in another SDR, unless it is moved from one SDR license pool to another. Use the **license move** command.

license add

Task ID	Task ID	Operations
	pkg-mgmt	execute

Examples

In the following example, a software license is added to the owner SDR:

```
RP/0/RP0/CPU0:router# admin  
RP/0/RP0/CPU0:router(admin)# license add disk1:/P1-CRS-8_TBA09370035_  
20070207195224661.lic
```

License command "license add disk1:/P1-CRS-8_TBA09370035_20070207195224661.lic sdr Owner" completed successfully.

Related Commands

Command	Description
license move	Moves a license from one SDR license pool to another.
license pool create	Creates a license pool for the specified secure domain router (SDR).
show license udi	Displays the unique device identifier (UDI) information for the router.

license backup

To back up all licenses contained on the persistent storage of the router, use the **license backup** command in administration EXEC mode.

license backup *backup-file*

Syntax Description	<i>backup-file</i>	Name and location of the backup file to be created or modified. This can be a local file, or a remote file on a TFTP or rcp server.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Use the **license backup** command to back up the licenses stored in the persistent storage on the router. We recommend this so that you can restore the licenses at one time while recovering from a failed disk situation. The destination location can be local to the system; in other words, a flash disk or hard disk. Alternatively, it can be a remote file on a TFTP or rcp server. The license information includes the licenses as well as the operational information, such as the slot the licenses are allocated to and the current license operation identifier.

If the backup file already exists, you are prompted to confirm before the file is overwritten.

When licenses are backed up, they can be restored as required using the **license restore** command.

Task ID	Task ID	Operations
	pkg-mgmt	execute

Examples

The following example shows how to back up the licenses on a router:

```
RP/0/0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license backup disk1:/license_back
```

License command "license backup disk1:/license_back" completed successfully.

Related Commands

Command	Description
license restore	Restores licenses on the router from a previously created backup file.
show license backup	Displays the backup license file.

license move

To move a license from one secure domain router (SDR) license pool to another, use the **license move** command in administration EXEC mode.

license move *feature-id* {**all** | *count*} **sdr** *source-sdr-name* **sdr** *dest-sdr-name*

Syntax Description

<i>feature-id</i>	Identifier for the feature entitled in the licenses to be moved. You can display available licenses using the show license command.
all	Specifies to move all available licenses with the specific feature identifier.
<i>count</i>	Number of licenses to move.
sdr <i>source-sdr-name</i>	Specifies the SDR license pool from which to move the specified licenses. The <i>source-sdr-name</i> argument is the name assigned to the SDR.
sdr <i>dest-sdr-name</i>	Specifies the SDR license pool to which the license should be moved. The <i>source-sdr-name</i> argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

By default, there is only one license pool available. If you have created multiple license pools, you can use the **license move** command to move the license to a different SDR license pool.

The **license move** command is used only to move licenses between SDR license pools on the same router. To move licenses between routers, you must first remove the license from the original router using the **license remove** command, and then add it to the new router using the **license add** command. To move licenses between routers, you also need to generate a new license key on Cisco.com. The license registration tool is located at the following URL:

<https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet>.

Licenses can be moved only if they are in the available state. In other words, you have to clear the feature configuration before a license can be released back to the appropriate license pool.

Task ID	Task ID	Operations
	pkg-mgmt	execute

Examples

The following example shows how to move a license from one license pool to another:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license move crs-msc-40g sdr owner sdr mysdr
```

Related Commands	Command	Description
	license add	Adds a license to a secure domain router (SDR) license pool.
	show license	Displays all licenses on the router.

license move slot

To move a license from one slot to another, use the **license move slot** command in EXEC or administration EXEC mode.

license move *feature-id* **slot** [*count*] **from** {*node-id* | **allocated**} **to** {*node-id* | **available**}

Syntax Description

<i>feature-id</i>	Identifier for the feature entitled in the licenses to be moved. You can display available licenses using the show license command.
<i>count</i>	Number of licenses to move. This argument cannot be used in conjunction with the allocated and available keywords.
from	Specifies from where to move the specified licenses.
<i>node-id</i>	Specific node from which to move the license.
allocated	Specifies to move all allocated licenses with the specific feature identifier. This keyword must be used in conjunction with the available keyword.
to	Specifies to where to move the specified licenses.
<i>node-id</i>	Specific node to which to move the license.
available	Specifies to move the specified allocated licenses into the available state. This keyword must be used in conjunction with the allocated keyword.

Defaults

One license is moved.

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **license move slot** command moves slot-based licenses from one slot to another slot on the same router.

■ license move slot

Use the **allocated** keyword to move all allocated licenses into the available state. The **allocated** keyword must be used in conjunction with the **available** keyword. If no allocated licenses are available that match the feature identifier, the **license move slot** command revokes used licenses on the given slot.

If licenses are going to be revoked on the source card, a warning prompt is displayed.

Licenses can be moved only if they are in the available state. In other words, you have to clear the feature configuration before a license can be released back to the appropriate license pool.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to move a license from one slot to another:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license move crs-msc-40g slot 1 from 0/1/cpu0 to 0/4/cpu0
```

The following example shows how to move all licenses to the available state:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license move crs-msc-40g slot from allocated to available
```

Related Commands

Command	Description
license add	Adds a license to a secure domain router (SDR) license pool.
show license	Displays all licenses on the router.

license pool create

To create a new secure domain router (SDR) license pool, use the **license pool create** command in administration EXEC mode.

license pool create sdr *sdr-name*

Syntax Description	sdr <i>sdr-name</i>	Creates a license pool on the specified SDR. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Before the **license pool create** command can be used, the SDR must exist.

By default, there is only one license pool available. You can create a license pool for each SDR on the router. If there were any licenses in use on nodes in the SDR prior to creating the pool, the licenses are automatically moved to the newly created license pool.

When a license is associated with a specific SDR license pool, you cannot use it for entitlement on another SDR. To move a license from one license pool to another, use the **license move** command. Use the **license add** command to add licenses to the newly created license pool.

To remove an SDR license pool, use the **license pool remove** command.

Task ID	Task ID	Operations
	pkg-mgmt	execute

Examples

The following example shows how to create a new license pool for an SDR:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license pool create sdr mysdr
```

License command "license pool create mysdr" completed successfully.

Related Commands

Command	Description
license add	Adds a license to a secure domain router (SDR) license pool.
license move	Moves a license from one SDR license pool to another.
license pool remove	Removes an SDR license pool.

license pool remove

To remove a secure domain router (SDR) license pool, use the **license pool remove** command in administration EXEC mode.

license pool remove sdr *sdr-name*

Syntax Description	sdr <i>sdr-name</i>	Creates a license pool on the SDR specified by <i>sdr-name</i> . The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

By default, there is only one license pool available. If you have created multiple license pools, you can use the **license pool remove** command to remove them as desired. You cannot remove the default license pool in the owner SDR.

If you remove a license pool that contains licenses, the licenses are automatically returned to the owner SDR license pool.

Task ID	Task ID	Operations
	pkg-mgmt	execute

Examples

The following example shows how to remove an SDR license pool:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license pool remove sdr mysdr
```

License command "license pool remove sdr mysdr" completed successfully.

Related Commands

Command	Description
license pool create	Creates a license pool for the specified secure domain router (SDR).

license restore

To restore the licenses on a router using an earlier backup copy, use the **license restore** command in administration EXEC mode.

license restore *backup-file*

Syntax Description	<i>backup-file</i>	Name and location of the backup file to be used for the license restore. This can be a local file, or a remote file on a TFTP or rcp server.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

The **license restore** command restores the licenses on the router using an earlier backup copy that was created using the **license backup** command. The source location can be local to the system, in other words, a flash disk or hard disk. Alternatively, it can be a remote file on a TFTP or rcp server.

Before the licenses are restored, the license manager verifies the following:

- The backup format is valid.
- The licenses are issued for the chassis where the CLI is being run.
- The license operation identifier in the backup file matches the one on the router EEPROM.

Task ID	Task ID	Operations
	pkg-mgmt	execute

Examples

The following example shows how to move a license from one license pool to another:

```
RP/0/0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license restore disk1:/license_back
```

Info: This command will erase all existing licenses.

Info: It is strongly recommended to backup existing licenses first.

Do you wish to proceed? [yes/no]: y

License command "license restore disk1:/license_back" completed successfully.

Related Commands

Command	Description
license backup	Backs up all licenses contained on the persistent storage of the router.

show hw-module linecard throughput

To display the throughput of modular services cards (MSCs) in the Cisco CRS-1 router, or SPA interface processors (SIPs) in the Cisco XR 12000 Series Router, use the **show hw-module linecard throughput** command in EXEC mode.

show hw-module linecard throughput [**location** *node-id*]

Syntax Description	location <i>node-id</i>	Specifies the node for which to display the throughput. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.

Defaults	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1.
	Release 3.6.0	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Use the **show hw-module linecard throughput** command on the Cisco CRS-1 to determine if MSCs are running at 40 Gbps or 20 Gbps throughput. Use the **show hw-module linecard throughput** command on the Cisco XR 12000 Series Router to determine at what throughput SIPs are operating.

Task ID	Task ID	Operations
	interface	read
	drivers	read

Examples	The following example displays sample output from the show linecard throughput command on the Cisco CRS-1:

```
RP/0/RP0/CPU0:router# show hw-module linecard throughput
```

```
----- Throughput -----
Location          Configured    Lic Acquired   Operating
```

show hw-module linecard throughput

```

0/6/CPU0      no config      No      20G
0/1/CPU0      no config      Yes     40G

```

The following example displays sample output from the show linecard throughput command on the Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# show hw-module linecard throughput
```

```

----- Throughput -----
Location      Lic Acquired   Operating      Configured      Default
0/4/CPU0      No             10G            --             10G
0/2/CPU0      No             10G            --             10G
0/3/CPU0      Yes            10G            10G            2.5G
0/1/CPU0      Yes            5G             5G             2.5G
0/5/CPU0      Yes            10G            10G            5G
0/6/CPU0      No             2.5G           --             2.5G
0/7/CPU0      No             5G             --             5G

```

Table 80 describes the significant fields shown in the display.

Table 80 *show hw-module linecard throughput Field Descriptions*

Field	Description
Location	Indicates the specific card location.
Configured	Indicates whether or not the feature is configured on this card.
Lic Acquired	Indicates whether or not a license is acquired for the card.
Operating	Indicates if the MSC is operating at 40 Gbps or 20 Gbps for the Cisco CRS-1; indicates if the linecard is operating at 5 Gbps or 10 Gbps for the Cisco XR 12000 Series Router.
Default	(Cisco XR 12000 Series Router only) Indicates the default bandwidth for the card.

Related Commands

Command	Description
hw-module linecard throughput (Cisco XR 12000 Series Router)	Configures a SPA interface processor (SIP) card to operate at either 5 Gbps or 10 Gbps.
hw-module linecard throughput (CRS-1)	Configures a modular services card (MSC) to operate at either 20 Gbps or 40 Gbps.

show license

To display all license information, use the **show license** command in EXEC or administration EXEC mode.

show license [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description	<i>feature-id</i>	(Optional) Identifier for the feature entitled in the licenses to be displayed.
	location <i>node-id</i>	(Optional) Specifies the location of the card. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	sdr <i>sdr-name</i>	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults	No default behavior or values

Command Modes	Administration EXEC EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	Support was added for EXEC mode.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .
	The show license command displays all license information. Alternatively, you can display license information for a specific feature identifier, slot location, or SDR by using the available options.
	If the feature process has supplied an opaque string while checking out the license, that string is displayed next to the feature identifier in the command output.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license

FeatureID: CRS-MSC-40G (Slot based, Implicit[Remaining time: 81 days])
  Total licenses 2
    Available for use          0
    Allocated to location      2
    Active                    0
  Pool: Owner
    Total licenses in pool: 2
    Status: Available 0      Operational: 2
    Locations with licenses: (Active/Allocated) [SDR]
      0/0/CPU0          (0/1) [Owner]
      0/1/CPU0          (0/1) [Owner]
```

Table 81 describes the significant fields shown in the display.

Table 81 *show license Field Descriptions*

Field	Description
FeatureID	Feature to which the licenses apply. The type of license is designated as one of the following: - Permanent licenses—Enable a designated feature permanently as long as the license resides on the router. - Evaluation or metered licenses—Enable a feature for a limited period of time. - Implicit licenses—Metered licenses that are included with the software image (upgrade or initial installation).
Total licenses	Number of licenses on the router.
Available for use	Number of licenses that are not currently active.
Allocated to location	Number of licenses allocated to a slot but not used.
Active	Number of licenses currently checked out or being used by applications.
Pool	License pool to which the licenses belong.
Total licenses in pool	Number of licenses in the specific pool.

Table 81 *show license Field Descriptions (continued)*

Field	Description
Status	Indicates the number of licenses in each state. Licenses can have the following states: Available—The license is available in the pool and can be assigned to a slot/feature process. For example, a recently added 40-Gbps license to the router is available before it gets checked out by a card. Allocated—The license is assigned to a slot but is unused. In other words, the feature process is not using the license. For example, a 40-Gbps license is allocated to slot 5 if the license was previously used but the card is currently in the shutdown state. Active—The feature process has checked out a license. Generally this happens when the feature is actively using the license. For example, if a card is in IOS XR RUN state and is passing traffic at 40 Gbps, a 40-Gbps license is in the used state in that slot. Operational—All licenses that are either active or allocated. Expired—the license has expired. This is applicable only for evaluation licenses or licenses granted by Cisco.
Locations with licenses	Slot where the licenses are being used, followed by an indication of whether the license is active or allocated, and to which license pool it belongs.

show license active

To display license information for all licenses that are currently checked out or being used by an application, use the **show license active** command in EXEC or administration EXEC mode.

show license active [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description	<i>feature-id</i>	(Optional) Identifier for the feature entitled in the licenses to be displayed.
	location <i>node-id</i>	(Optional) Specifies the location of the card. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	sdr <i>sdr-name</i>	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults No default behavior or values

Command Modes Administration EXEC
EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	Support was added for EXEC mode.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show license active** command displays all license information regarding licenses that are currently checked out or being used by an application. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license active** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license active

FeatureID: CRS-MSC-40G (Slot based, Implicit[Remaining time: 90 days])
  Status: Active          2
    SDR: Owner
    Operational:         2
    Location: 0/1/CPU0      1
              0/6/CPU0      1
```

See [Table 81](#) for a description of the significant fields shown in the display.

show license allocated

To display license information for all licenses allocated to a slot but not used, use the **show license allocated** command in EXEC or administration EXEC mode.

show license allocated [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description	<i>feature-id</i>	(Optional) Identifier for the feature entitled in the licenses to be displayed.
	location <i>node-id</i>	(Optional) Specifies the location of the card. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	sdr <i>sdr-name</i>	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults No default behavior or values

Command Modes Administration EXEC
EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	Support was added for EXEC mode.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show license allocated** command displays all license information regarding licenses that are allocated to a slot but are not currently being used. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license allocated** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license allocated

FeatureID: CRS-MSC-40G (Slot based, Permanent)
  Status: Allocated      1
    SDR: Owner
      Status: Operational:    1
      Locations with licenses: (Active/Allocated)
                                0/1/CPU0          (0/1)

FeatureID: XC-L3VPN (Slot based, Permanent)
  No allocated licenses.
```

See [Table 81](#) for a description of the significant fields shown in the display.

show license available

To display all licenses that are not currently in use or allocated to specific slots, use the **show license available** command in EXEC or administration EXEC mode.

show license available [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description	<i>feature-id</i>	Identifier for the feature entitled in the licenses to be displayed.
	location <i>node-id</i>	Specifies the location of the card. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	sdr <i>sdr-name</i>	Displays the licenses in the specified secure domain router (SDR) license pool. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults No default behavior or values

Command Modes Administration EXEC
EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	Support was added for EXEC mode.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show license available** command displays all licenses that currently are not being used or allocated to a specific slot. You can display only licenses with a specific feature identifier, slot location, or SDR by using the available options.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license available** command with only implicit licenses available:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license available

FeatureID: CRS-MSC-40G (Slot based, Implicit[Remaining time: 90 days])
  Status: Available      0
    SDR: Owner
      Status: Available    0
  Location: 0/1/CPU0      1
           0/6/CPU0      1
```

The following example displays sample output from the **show license available** command with permanent licenses installed:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license available

FeatureID: CRS-MSC-40G (Slot based, Permanent)
  Status: Available      7
    SDR: Owner
      Status: Available    7

FeatureID: XC-L3VPN (Slot based, Permanent)
  Status: Available      8
    SDR: Owner
      Status: Available    8
```

See [Table 81](#) for a description of the significant fields shown in the display.

show license backup

To display the backup license file, use the **show license backup** command in administration EXEC mode.

show license backup *file-name*

Syntax Description	<i>file-name</i>	Name of the backup license file.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

The **show license backup** command displays the UDI information and license summary of a backup database, so that you can confirm the contents of a particular backup file before restoring it. Create the backup license file using the **license backup** command. Restore licenses from a backup using the **license restore** command.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples	The following example displays sample output from the show license evaluation command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license backup disk1:/license_back
```

```
Local Chassis UDI Information:
  S/N           : TBA09370035
  Operation ID:  5
```

```

Licenses      :
FeatureID     Type                               #installed
CRS-MSC-40G   Slot based,      Permanent          2
XC-L3VPN      Slot based,      Permanent          1

```

Table 82 describes the significant fields shown in the display.

Table 82 *show license backup Field Descriptions*

Field	Description
S/N	Chassis serial number.
Operation ID	License operation ID number. The license operation ID is incremented by the license manager every time there is a successful license add or remove operation.
FeatureID	Feature to which the licenses apply.
Type	Type of license: slot-based or chassis-based; permanent, evaluation, or implicit.
#installed	Number of such licenses installed.

Related Commands

Command	Description
license backup	Backs up all licenses contained on the persistent storage of the router.
license restore	Restores licenses on the router from a previously created backup file.

show license evaluation

To display information about any evaluation licenses currently allocated, available, or in use, use the **show license evaluation** command in EXEC or administration EXEC mode.

show license evaluation [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description	<i>feature-id</i>	(Optional) Identifier for the feature entitled in the licenses to be displayed.
	location <i>node-id</i>	(Optional) Specifies the location of the card. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	sdr <i>sdr-name</i>	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults No default behavior or values

Command Modes Administration EXEC
EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	Support was added for EXEC mode.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show license evaluation** command displays information regarding any evaluation licenses that are currently allocated, available, or in use, including the number of days left until they expire. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license evaluation** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license evaluation

FeatureID: XC-L3VPN (Non slot based, Evaluation[Valid])
Valid for 2day(s) from 15:13:16 Nov 17 2006
Remaining time: 1day(s) 21:07:46
Status: Available      6  Allocated      0  Active      0
SDR: Owner
      Status: Available      6  Operational:      0
```

See [Table 81](#) for a description of the significant fields shown in the display.

show license expired

To display information regarding evaluation licenses that have expired, use the **show license expired** command in EXEC or administration EXEC mode.

show license expired [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description	<i>feature-id</i>	(Optional) Identifier for the feature entitled in the licenses to be displayed.
	location <i>node-id</i>	(Optional) Specifies the location of the card. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	sdr <i>sdr-name</i>	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults No default behavior or values

Command Modes Administration EXEC
EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	Support was added for EXEC mode.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show license expired** command displays information regarding evaluation licenses that have expired. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license expired** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license expired

FeatureID: XC-L3VPN (Non slot based, Evaluation[Expired])
  Status: Available      6  Allocated      0  Active      0
    SDR: Owner
      Status: Available      6  Operational:      0
```

See [Table 81](#) for a description of the significant fields shown in the display.

show license log

To display the operational or administrative logs for the license system, use the **show license log** command in EXEC or administration EXEC mode.

show license log { **operational** | **administration** } { *request-id* | *feature-id* | **sdr** *sdr-name* }

Syntax Description

operational	Displays the operational logs for the license system.
administration	Displays the administration logs for the license system.
<i>request-id</i>	Identifier of a particular log entry.
<i>feature-id</i>	Identifier for the feature entitled in the licenses to be displayed.
sdr <i>sdr-name</i>	Displays the licenses in the specified secure domain router (SDR) license pool. The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC
EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show license log** command displays the operational or administrative logs for the license system. The administrative log displays all licenses that are added, removed, or moved along with a timestamp and username of the person who initiated the request. This log persists across reloads. The operation log displays when a license was checked out or released by a feature. The license release can be done by the license manager if it detects that the feature is not responding. This log does not persist between reloads.

You can display license information for a specific feature identifier or SDR by using the available options.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license log** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license log operational
#ID      :SDR      :FeatureID      :NodeID      :Time:    Log
1        :Owner     :CRS-MSC-40G    :0/6/CPU0    :Tue Feb  6 21:33:16 2007: license_acquire:
opaque_string , result(No error)
2        :Owner     :CRS-MSC-40G    :0/1/CPU0    :Tue Feb  6 21:33:16 2007: license_acquire:
opaque_string , result(No error)
```

See [Table 81](#) for a description of the significant fields shown in the display.

show license pools

To display the currently configured set of license pools, use the **show license pools** command in administration EXEC mode.

show license pools [detail]

Syntax Description	detail (Optional) Displays the locations of the licenses in each pool.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

The **show license pools** command displays all license pools, and the features that are enabled with the licenses in each pool. By default, all licenses are contained in the owner SDR pool. If you have created SDR license pools with the **license pool create** command, you can place licenses in separate pools.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays sample output from the **show license pools** command. In this example, the owner SDR has both 40-Gbps and Layer_3 VPN licenses, while the SDR sdr2 has only 40-Gbps licenses.

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license pools

Pool Name      Feature
=====
Owner          CRS-MSC-40G XC-L3VPN
sdr2           CRS-MSC-40G
```

[Table 83](#) describes the significant fields shown in the display.

Table 83 *show license pools Field Descriptions*

Field	Description
Owner	SDR license pool.
Feature	Feature that is enabled in the specified license pool.

Related Commands

Command	Description
license pool create	Creates a license pool for the specified secure domain router (SDR).

show license udi

To display unique device identifier (UDI) information for the router, use the **show license udi** command in administration EXEC mode.

show license udi

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The **show license udi** command displays the complete UDI of the router to which any license will be associated. The UDI comprises the chassis serial number, along with a license operation ID number. The UDI is used to acquire a license file using the license registration tool on CCO. The license tool is located at the following URL: <https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet>.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples The following example displays sample output from the **show license udi** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license udi

Local Chassis UDI Information:
  PID           : CRS-8-LCC
  S/N           : TBA09370035
  Operation ID: 1
```


Table 84 describes the significant fields shown in the display.

Table 84 *show license udi Field Descriptions*

Field	Description
PID	Product ID number.
S/N	Chassis serial number.
Operation ID	License operation ID number. The license operation ID is incremented by the license manager every time there is a successful license add or remove operation.

■ show license udi



Software Package Management Commands on Cisco IOS XR Software

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 the Cisco IOS XR software, see *Cisco IOS XR Getting Started Guide*.

clear install boot-options

To clear the boot options for a specified location or for all locations, use the **clear install boot-options** command.

clear install boot-options [**location** *node-id* | **all**]

Syntax Description

location <i>node-id</i>	Specifies a node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
all	Clears boot options for all locations.

Defaults

If no location is specified, the **clear install boot-options** command prompts you for confirmation and clears boot options for all locations.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.7.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **clear install boot-options** command to clear boot options that were set using the **install boot-options** command.

Task ID

Task ID	Operations
pkg-mgmt	read, write

Examples

The following example shows how to clear the boot options for all locations:

```
RP/0/RP0/CPU0:router(admin)#clear install boot-options
Install operation 4 '(admin) clear install boot-options location all' started
by user 'salevy' via CLI at 14:03:34 DST Sat Mar 15 2008.
Proceed with clearing boot options for all nodes? [confirm]
Install operation 4 completed successfully at 14:03:49 DST Sat Mar 15 2008.
```

Related Commands

Command	Description
install boot-options	Sets boot options.
show install boot-options	Displays boot options.

clear install label

To clear a label from an installation rollback point, use the **clear install label** command in EXEC or administration EXEC mode.

clear install label *label*

Syntax Description	<i>label</i>	Label defined for an installation rollback point.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Use the **clear install label** command to remove a label associated with an installation rollback point. Labels are assigned using the **install label** command.

Task ID	Task ID	Operations
	pkg-mgmt	read, write

Examples	In the following example, the label brians_smu is removed from the associated installation rollback point.

```
RP/0/RP0/CPU0:router# clear install label brians_smu
```

```
Install operation 6 'clear install label brians_smu' started by user 'usr'
on SDR Owner via CLI at 09:28:04 DST Thu Aug 09 2007.
Install operation 6 completed successfully at 09:28:04 DST Thu Aug 09 2007.
```

Related Commands	Command	Description
	install label	Adds a label or description to both the current active software state and a state associated with a rollback point.

clear install log-history oldest

To clear the oldest log items from the installation history log, use the **clear install log-history oldest** command in EXEC or administration EXEC mode.

clear install log-history oldest *number*

Syntax Description

<i>number</i>	Specifies the number of log entries to clear. The oldest log entries are cleared.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Enter the **clear install log-history oldest** command in EXEC mode to clear the oldest installation history log entries only for the current SDR user. (The log entries for the admin user are not cleared.)

Enter the **clear install log-history oldest** command in administration EXEC mode to clear the oldest installation history log entries for all users. (This command impacts all users when entered in administration EXEC mode.)

Use the *number* argument to specify the number of the old log entries to be deleted.

Task ID

Task ID	Operations
pkg-mgmt	read, write

Examples

In the following example, the two oldest installation log history entries are cleared. Because this command is entered in EXEC mode, only the log entries for the current SDR user are deleted:

```
RP/0/RP0/CPU0:router# clear install log-history oldest 2

Install operation 5 'clear install log-history oldest 2' started by user
'user_b' at 13:28:27 UTC Sat Aug 26 2006.
Info:      Successfully deleted the following historylog points:
Info:      1, 2
Install operation 5 completed successfully at 13:28:29 UTC Sat Aug 26 2006.
```

In the following example, the five oldest installation log history entries are cleared for all users in the system. Because this command is entered in administration EXEC mode, the log entries for all secure domain router (SDR) users are deleted:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# clear install log-history oldest 5

Install operation 6 '(admin) clear install log-history oldest 5' started by
user 'user_b' at 13:35:50 UTC Sat Aug 26 2006.
Info:      Successfully deleted the following historylog points:
Info:      1, 2, 3, 4, 5
Install operation 6 completed successfully at 13:35:50 UTC Sat Aug 26 2006.
```

Related Commands

Command	Description
clear install rollback oldest	Deletes saved installation points from the installation buffer.
show install log	Displays the entries stored in the logging installation buffer.

clear install rollback oldest

To delete saved installation points from the installation buffer, use the **clear install rollback oldest** command in EXEC or administration EXEC mode.

clear install rollback oldest *points*

Syntax Description	<i>points</i>	Number of saved installation points to delete, beginning with the oldest saved installation point.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.0	This command was introduced on the Cisco CRS-1.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
	Release 3.3.0	No modification.
	Release 3.4.0	Support was added for EXEC mode.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Use the **clear install rollback oldest** command to delete saved installation points from the installation buffer.

Command Modes

- Enter the **clear install rollback oldest** command in administration EXEC mode to delete the saved installation points for all secure domain routers (SDRs).
- Enter the **clear install rollback oldest** command in EXEC mode to delete the saved installation points for the SDR to which you are logged in.

Task ID	Task ID	Operations
	pkg-mgmt	read, write

Examples

In the following example, the command **show install rollback ?** is used to display the available rollback points. The command **clear install rollback oldest 2** is then used to delete the two oldest rollback points. The command **show install rollback ?** is used again to display the remaining rollback points.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# show install rollback ?

 0  ID of the rollback point to show package information for
 2  ID of the rollback point to show package information for
 4  ID of the rollback point to show package information for
 9  ID of the rollback point to show package information for
10  ID of the rollback point to show package information for

RP/0/RP0/CPU0:router(admin)# clear install rollback oldest 2

Install operation 11 'clear install rollback oldest 2' started by user 'user_b'
at 18:11:19 UTC Sat Apr 08 2006.
Info:      Successfully deleted the following rollback points:
Info:      0, 2
Install operation 11 completed successfully at 18:11:21 UTC Sat Apr 08 2006.

RP/0/RP0/CPU0:router(admin)# show install rollback ?

 4  ID of the rollback point to show package information for
 9  ID of the rollback point to show package information for
10  ID of the rollback point to show package information for
```

Related Commands	Command	Description
	install rollback to	Rolls back the software set to a saved installation point or to the last committed installation point.
	show install log	Displays the entries stored in the logging installation buffer.
	show install rollback	Displays the software set associated with a saved installation point.

install abort

To abort an installation transaction, use the **install abort** command in EXEC or administration EXEC mode.

install abort [*request-id*]

Syntax Description

request-id (Optional) Request ID assigned to an installation operation.

Defaults

Abort the current installation operation.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 operation **install add** cannot be aborted, but the operation **install add...activate** 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.

Command Modes

- Enter the **install abort** command in administration EXEC mode to halt a software installation operation for all secure domain routers (SDRs).
- Enter the **install abort** command in EXEC mode to halt a software installation operation for the SDR to which you are logged in.

Task ID	Task ID	Operations
	pkg-mgmt	read, write

Examples

The following example shows how to halt a 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 add	Adds the contents of a PIE file to a storage device.
install activate	Adds a software package or SMU to the active software set.
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 EXEC or administration EXEC mode.

Administration EXEC Mode

```
install activate {id add-id [add-id2 ... add-id16] | device:package [device:package2 ...  
device:package16]} [auto-abort-timer time] [sdr list-of-sdr-names] [location node-id]  
[if-active] [admin-profile] [asynchronous | synchronous] [parallel-reload] [prompt-level  
{default | none}] [test] [pause sw-change]
```

EXEC Mode

```
install activate {id add-id [add-id2 ... add-id16] | device:package [device:package2 ...  
device:package16]} [auto-abort-timer time] [location node-id] [asynchronous |  
synchronous] [parallel-reload] [prompt-level {default | none}] [test] [pause sw-change]
```

Syntax Description		
id <i>add-id</i>		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.
<i>device:package</i>		Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-3.4.0). For the <i>device</i> argument, the value is a specified storage device, typically disk0:. This is the local storage device where the package was added with the install add command. Press ? after a partial package name to display all possible matches available for activation. If there is only one match, press the TAB key to fill in the rest of the package name. Note Multiple packages can be activated at a time. Up to 16 packages can be specified individually as of Cisco IOS XR Software Release 3.5.0. From Cisco IOS XR Software Release 3.6.0, multiple packages can be specified using the wildcard syntax, for example, <i>harddisk:*3.6*</i>. If multiple Software Maintenance Upgrades (SMUs) are activated, some SMUs may require a reload. If the operation requires a node reload, the user is prompted before the installation operation occurs.
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.
sdr <i>list-of-sdr-names</i>		(Optional. Administration EXEC mode only) Activates a package for a specific secure domain router (SDR). The value of the <i>sdr-name</i> argument is the name assigned to the SDR. To specify more than one SDR, list each SDR name separated by a space.

location <i>node-id</i>	(Optional) Activates a package on the designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation. Note A package cannot be activated on a single node unless some version of the package being activated is already active on all nodes. For example, a Multiprotocol Label Switching (MPLS) package cannot be active on only one node. If a version of the MPLS package is already active on all nodes, an MPLS package then could be upgraded or downgraded on a single node. Note To activate a package on all supported nodes, do not specify a location.
admin-profile	(Optional. Administration EXEC mode only. Cisco CRS-1 only.) Activates the package only for the admin-plane nodes. Admin plane nodes provide system-wide functionality and do not belong to a specific SDR. Examples of admin-plane nodes are fabric cards and service processor modules (SPs). The admin-profile keyword is used to update admin-plane resources without impacting the routing nodes in any SDRs.
if-active	(Optional. Administration EXEC mode only) Activates an optional package or SMU for an optional package only if a previous version of the package is already active. Use the if-active keywords when SDRs have different sets of active software packages.
asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, the 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 from the CLI prompt.

Defaults

Administration EXEC Mode

- The package is activated for all supported nodes on all SDRs in the system.
- The operation is performed in asynchronous mode: The **install activate** command runs in the background, and the EXEC prompt is returned as soon as possible.

EXEC Mode

- The package is activated on all supported nodes for the SDR.
- The operation is performed in asynchronous mode: The **install activate** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. This command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	Support was added for the SDR keyword and <i>sdr-name</i> argument. Support was added for the noprompt keyword.
Release 3.4.0	Support was added for EXEC mode. Support was added for the if-active keywords in administration EXEC mode.
Release 3.5.0	Support was added for the auto-abort-timer keyword.
Release 3.6.0	Support was added for the prompt-level and parallel-reload keywords. Support was added for wildcard syntax when specifying packages to be activated. Support was removed for the noprompt keyword.
Release 3.7.0	Support was added for the id keyword. Disruption during multiple SMU activation was reduced, requiring reloads in fewer cases.
Release 3.8.0	Support was added for the pause sw-change keywords.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **install activate** command to activate 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** keyword and *add-id* 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.

Upgrading and Downgrading Packages

- To upgrade a package, activate the newer version of the package; the older version is automatically deactivated.
- To downgrade a package, activate the older version of the package; the newer version is automatically deactivated.



Caution

Downgrading to Cisco IOS XR Software Release 3.7.0 or earlier is not supported if you are using a FAT32 flash disk. If you are using a FAT32 flash disk, and you must downgrade, convert the flash disk to FAT16 before downgrading. If you do not convert the flash disk to FAT16 before the downgrade, the disk becomes unreadable and the router does not boot. Converting from FAT32 to FAT16 is a complex procedure.

Actual activation is performed only after the compatibility checks have passed.



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.

Activating a Package for All Secure Domain Routers

To activate a package for all secure domain routers (SDRs) in the system, use the **install activate** command in administration EXEC mode.



Note

To enter administration EXEC mode, you must be logged in to the owner SDR, and have root-system access privileges.

Activating a Package for a Specific SDR

- To activate a package for a specific SDR from administration EXEC mode, use the **install activate** command with the **sdr** keyword and *sdr-name* argument.
- To activate a package when logged into an SDR, use the **install activate** command in EXEC mode.



Note

Some packages do not support SDR-specific activation and can only be activated for all SDRs simultaneously from administration EXEC mode. For detailed instructions, see the *Managing Cisco IOS XR Software Packages* module of *Cisco IOS XR System Management Configuration Guide*.

Activating New Versions of the Currently Active Packages

Use the **install activate** command with the **if-active** keyword to activate the package only on SDRs where a previous version of the package is already active. This command is available only in administration EXEC mode.

The **if-active** keyword is used only for optional packages or SMUs for optional packages.

Router Reloads Following Package Activation

If the activation requires a reload of the SDR or all SDRs, a confirmation prompt appears. Use the **install activate** command with the **prompt-level none** keywords to automatically ignore any reload confirmation prompts and proceed with the package activation. The router reloads if required.

Node Reloads Following Package Activation

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.

Synchronous Mode

Use the **install activate** command with the **synchronous** keyword to complete the operation before the prompt is returned. A progress bar indicates the status of the operation. For example:

```
- 1% complete: The operation can still be aborted (ctrl-c for options)
\ 10% complete: The operation can still be aborted (ctrl-c for options)
```

When the **install activate** command is run in asynchronous mode, the system may stay in synchronous mode for a short period of time while the system checks for questions to ask the user.

Press **Ctrl-C** during a synchronous operation to abort the operation or make the operation asynchronous.

Test Option

Use the **test** keyword to verify the effects of the proposed operations and determine whether the installation 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.

Auto Abort Option

Use the **auto-abort-timer** keyword to provide a safety mechanism for the instance that a package is activated and for some reason access to the router is lost. This option automatically rolls back to the current committed loadpath, thereby undoing any changes that are activated with the **install activate** command. After the installation, if the activated software is working correctly, use the **install commit** command to cancel the timer and commit the new loadpath.



Note

The changes made to the active software set are not persistent during route processor (RP) reloads. Use the **install commit** command to make changes persistent.

Parallel Reload

Install operations are activated according to the method encoded in the package being activated. Generally, this method has the least impact for routing and forwarding purposes, but it may not be the fastest method from start to finish and can require user interaction by default. To perform the installation procedure as quickly as possible, you can specify the **parallel-reload** keyword. This forces the installation to perform a parallel reload, so that all cards on the router reload simultaneously, and then come up with the new software. This impacts routing and forwarding, but it ensures that the installation is performed without other issues.

Pausing Before Configuration Lock

Use the **pause sw-change** keywords to pause the operation before locking the configuration. An **install activate** operation begins with preparatory steps, such as software checks, and then proceeds with the actual activation of the new software. The configuration is locked for the activation. 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 activation whenever you choose. This is useful, for example, if your workflow involves configuring a router out of the network during software installation 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	execute

Examples

The following example shows how to display the packages available for activation using the online help system. In this example, **?** is entered after a partial package name to display all possible matches:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install activate disk0:?

disk0:comp-hfr-mini-3.4.0  disk0:hfr-admin-3.4.0  disk0:hfr-base-3.4.0
disk0:hfr-diags-3.4.0
disk0:hfr-fwdg-3.4.0      disk0:hfr-k9sec-3.4.0  disk0:hfr-lc-3.4.0
disk0:hfr-mcast-3.4.0
disk0:hfr-mgbl-3.4.0      disk0:hfr-mpls-3.4.0  disk0:hfr-os-mbi-3.4.0.1
I disk0:hfr-rout-3.4.0
```

The following example shows how to activate a package that was installed in an **install add** operation that was assigned install operation id 2:

```
RP/0/RP0/CPU0:router(admin)# install activate id 2

Install operation 3 '(admin) install activate id 2' started by user 'lab' via
CLI at 01:10:21 UTC Thu Jan 03 2008.
Info:      This operation will activate the following package:
Info:      disk0:hfr-mcast-3.7.0
Info:      Install Method: Parallel Process Restart
The install operation will continue asynchronously.
Info:      The changes made to software configurations will not be persistent
Info:      across system reloads. Use the command '(admin) install commit' to
Info:      make 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 packages
Install operation 3 completed successfully at 01:11:30 UTC Thu Jan 03 2008.
```

The following example shows how to activate a package on all nodes for all SDRs. Use the **install commit** command to make the changes persistent across designated secure domain router shelf controller (DSDRSC) reloads.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install activate disk0:hfr-mpls-3.4.0 synchronous

Install operation 15 'install activate disk0:hfr-mpls-3.4.0 synchronous'
started by user 'user_b' at 19:15:33 UTC Sat Apr 08 2006.
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
Install operation 15 completed successfully at 19:16:18 UTC Sat Apr 08 2006.
```

```
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.
```

The following example shows how to activate a package for a specific SDR:

```
RP/0/RP0/CPU0:router(admin)# install activate disk0:hfr-mpls-3.3.80 SDR CE1b
```

```
Install operation 2 'install activate disk0:hfr-mpls-3.3.80 on SDR: CE1b' started by user
'user_b'
Install operation 2 'install activate disk0:hfr-mpls-3.3.80 on SDR: CE1b' started by user
'user_b' at 15:31:23 GMT Mon Nov 14 2005.
Info:      SDR CE1b: Checking running configuration version compatibility with newly
activated software ...
Info:      SDR CE1b: No incompatibilities found between the activated software and router
running configuration.
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
Install operation 2 completed successfully at 15:32:28 GMT Mon Nov 14 2005.
```

The following example shows how to activate a package for multiple SDRs. To perform this operation, enter the **install activate** command with the **sdr** keyword, and list the SDR names. In this example, the SDR names are “Owner” and “user_a”. Use the **install commit** command to make the changes persistent across designated secure domain router shelf controller (DSDRSC) reloads.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install activate disk0:hfr-mcast-3.4.0.10I synchronous sdr
Owner user_a

Install operation 7 '(admin) install activate disk0:hfr-mcast-3.4.0.10I synchronous sdr
Owner user_a' started by user 'abc' via CLI at 11:32:29 UTC Mon Sep 25 2006.
Info:      This operation will reload the following node:
Info:      0/RP0/CPU0 (RP) (SDR: Owner)
Info:      This operation will reload all RPs in the Owner SDR, and thereby indirectly
cause every node in the router to reload.
Proceed with this install operation (y/n)? [y]

- 85% complete: The operation can no longer be aborted (ctrl-c for options)[OK]ting Commit
Database. Please wait...
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
Install operation 7 completed successfully at 11:33:08 UTC Mon Sep 25 2006.
```

The following example shows how to activate multiple software packages using the wildcard syntax:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install activate disk0:*3.6*

Install operation 2 '(admin) install activate disk0:*3.6*' started by user 'user_a' via
CLI at 04:30:01 PST Fri Dec 28 2007.
Info:      This operation will activate the following packages:
```

```

Info:      disk0:hfr-rout-3.6.0
Info:      disk0:hfr-lc-3.6.0
Info:      disk0:hfr-fwdg-3.6.0
Info:      disk0:hfr-admin-3.6.0
Info:      disk0:hfr-base-3.6.0
Info:      disk0:hfr-os-mpi-3.6.0
Info:      disk0:hfr-fpd-3.6.0
Info:      disk0:hfr-diags-3.6.0
Info:      disk0:hfr-mgbl-3.6.0
Info:      disk0:hfr-mpis-3.6.0
Info:      disk0:hfr-mcast-3.6.0
Info:      disk0:hfr-k9sec-3.6.0
Warning:   The following packages are already active on the specified nodes:
Warning:   hfr-os-mpi-3.6.0
Warning:   hfr-base-3.6.0
Warning:   hfr-admin-3.6.0
Warning:   hfr-fwdg-3.6.0
Warning:   hfr-lc-3.6.0
Warning:   hfr-rout-3.6.0
Warning:   Please check:
Warning:   - check the name of the packages being activated.
Warning:   - check the set of active packages using 'show install active'.
Info:      Install Method: Parallel Process Restart
Info:      The changes made to software configurations will not be persistent across
system reloads. Use the command '(admin)
Info:      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 2 completed successfully at 04:32:01 PST Fri Dec 28 2007.

```

The warning messages are expected, because the packages are already active.

The following example shows a synchronous package activation operation, in which the operation is paused before the configuration is locked for the actual software activation.

```
RP/0/0/CPU0:router# install activate disk0:c12k-firewall synchronous pause sw-change
```

```

Wed Jul 23 14:28:40.865 UTC
Install operation 6 'install activate disk0:c12k-firewall-3.8.0.10I synchronous
pause sw-change' started by user 'salevy' on SDR Owner via CLI at 14:28:41 UTC
Wed Jul 23 2008.
Info:   Install Method: Parallel Process Restart
The install operation has paused before the configuration is locked as
requested by user 'salevy'.
Please perform any changes to the configuration that are required before the
operation is to continue.
How should the operation continue?
Abort the operation (abort)
Lock the config and complete the operation (complete)
Suspend the operation and return to the Command Line Interface (cli)
Please confirm an option (abort/complete/cli): [complete] cli
Use the command 'install operation 6 ?' to find how to continue the operation.

```

```
RP/0/0/CPU0:router# install operation 6 ?
```

```

abort   Abort the operation
attach  Attach to the operation
complete Phase to run to end of

```

```

RP/0/0/CPU0:router# install operation 6 complete
Wed Jul 23 14:29:46.367 UTC
RP/0/0/CPU0:router#Info:   Install operation 6 has been resumed.
Info:   The changes made to software configurations will not be persistent

```

```

Info:  across system reloads. Use the command ' (admin) install commit' to
Info:  make 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 packages
Install operation 6 completed successfully at 14:30:31 UTC Wed Jul 23 2008.

```

The following example shows an asynchronous package activation operation, in which the operation is paused before the configuration is locked for the actual software activation:

```
RP/0/0/CPU0:router# install activate disk0:c12k-firewall pause sw-change
```

```

Wed Jul 23 15:14:56.899 UTC
Install operation 12 'install activate disk0:c12k-firewall-3.8.0.10I pause sw-change' started
by user 'salevy' on SDR Owner via CLI
at 15:14:57 UTC Wed Jul 23 2008.
The install operation will continue asynchronously.
RP/0/0/CPU0:router#Info:  Install Method: Parallel Process Restart
Info:  Install operation 12 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 12 complete'.
Info:    - run the command 'install operation 12 attach synchronous' and then answer the query.

```

```
RP/0/0/CPU0:router# install operation 12 complete
```

```

Wed Jul 23 15:18:43.682 UTC
RP/0/0/CPU0:router#Info:  Install operation 12 has been resumed.
Info:  The changes made to software configurations will not be persistent across system reloads.
Use the command ' (admin)
Info:  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 12 completed successfully at 15:19:23 UTC Wed Jul 23 2008.

```

Related Commands

Command	Description
install add	Adds the contents of a PIE file to a storage device.
install commit	Makes the current active software set persistent across RP reloads.
install deactivate	Removes a package from the active software set.
show install active	Displays active software packages.
show install log	Displays the entries stored in the logging installation buffer.
show install request	Displays the list of incomplete installation manager requests.

install add

To copy the contents of a package installation envelope (PIE) file to a storage device, use the **install add** command in EXEC or administration EXEC mode.

Administration EXEC Mode

```
install add [source source-path | tar] file [activate [pause sw-change] [admin-profile]
[auto-abort-timer time] [location node-id]] [asynchronous | synchronous] [parallel-reload]
[prompt-level { default | none}] [if-active] [sdr sdr-name]
```

EXEC Mode

```
install add [source source-path | tar] file [activate [pause sw-change] [auto-abort-timer time]
[location node-id]] [asynchronous | synchronous] [parallel-reload] [prompt-level { default |
none}]
```

Syntax Description		
source <i>source-path</i>		Source location of the PIE files to be appended to the PIE filenames. Location options are as follows: • disk0: • disk1: • compactflash: • harddisk: • ftp://username:password@hostname or ip-address/directory-path/ • rnp://username@hostname or ip-address/directory-path/ • tftp://hostname or ip-address/directory-path/
tar		Indicates that the PIE file is contained in a tar file.
<i>file</i>		Name and location of the PIE file (composite package) to install. If a source path location is specified using the source keyword, the <i>file</i> argument can be either a fully specified PIE file path, or a path to the PIE file relative to the source path. Note Up to 32 PIE files can be added to a device in a single install add operation. If the tar keyword is used, the <i>file</i> argument is a tar file that contains one or more PIE files, or directories containing PIE files.
activate		(Optional) Activates the package or packages. This option is run only if the install add operation is successful.
pause sw-change		(Optional) Pauses the operation before locking the configuration for the software activation. While the operation is paused, you can perform configuration changes. You control the resumption of the operation at the CLI prompt.

admin-profile	(Optional. Administration EXEC mode only. Cisco CRS-1 only.) Activates the package only for the admin-plane nodes. Admin-plane nodes provide system-wide functionality and do not belong to a specific SDR. Examples of admin-plane nodes are fabric cards and service processor modules (SPs). The admin-profile keyword is used to update admin-plane resources without impacting the routing nodes in any SDRs
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>	(Optional) Activates a package on the designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation. Note A package cannot be activated on a single node unless some version of the package being activated is already active on all nodes. For example, a Multiprotocol Label Switching (MPLS) package cannot be active on only one node. If a version of the MPLS package is already active on all nodes, an MPLS package then could be upgraded or downgraded on a single node.
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.
if-active	(Optional. Administration EXEC mode only.) Activates the optional packages only if a version is already active.
sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.) Activates a package for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.

Defaults

Packages are added to the storage device, 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

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	Support was added for the activate , sdr , noprompt , and location keywords and their associated arguments. Support was removed for the to device keyword and argument.
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	Support was added for the source , auto-abort-timer , and admin-profile keywords. Support was added for the addition of up to 32 PIE files in a single install add operation.
Release 3.6.0	Support was added for the tar , prompt-level and parallel-reload keywords. Support was removed for the noprompt keyword.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for the pause sw-change keywords.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **install add** command to unpack the package software files from a PIE file and copy them to the boot device (usually disk0).

- From administration EXEC mode, the package software files are added to all route processors (RPs) installed in the SDRs effected by the **install add** command. If the **install add** command is entered without specifying an SDR, then the package files are added to all RPs in all SDRs. If the **install add** command is entered with the **sdr** keyword (to add the package files to a specific SDR), then the package files are added to all RPs installed in the specified SDR.
- From EXEC mode, the package software files are added to the RPs only for the SDR to which you are logged in.

**Note**

In the Cisco CRS-1 router, the package files are also added to any additional installed distributed router processors (DRPs) for the effected SDRs.

**Note**

If a package is added only to a non-owner SDR, then the package files and functionality are not available on the owner SDR, or on any other SDR. To add a package to all SDRs in the system, use the **install add** command without specifying an SDR.

Adding and Activating a Package

Software packages remain inactive until activated with the **install activate** command.

To add and activate a package at the same time, use the **install add** command with the **activate** keyword. When this command is used, the keywords and rules for package activation apply. See the “[install activate](#)” section on page 766 for more information.

- To add and activate a package for all SDRs, enter the **install add** command with the **activate** keyword from administration EXEC mode. To add and activate a package for a specific SDR from administration EXEC mode enter the **install add file activate** command with the **sdr sdr-name** keyword and argument.
- To add and activate a package on a non-owner SDR, enter the **install add** command with the **activate** keyword from EXEC mode.



Note

In Release 3.4.0 and later releases, SDR-specific activation is supported for specific packages and upgrades, such as optional packages and Software Maintenance Upgrades (SMUs). Packages that do not support SDR-specific activation can be activated for all SDRs simultaneously only from administration EXEC mode. For detailed instructions, see the *Managing Cisco IOS XR Software Packages* module of *Cisco IOS XR System Management Configuration Guide*.



Note

If a software activation 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.

Synchronous Mode

Use the **install add** command with the **synchronous** keyword to complete the operation before the prompt is returned. A progress bar indicates the status of the operation. For example:

```
- 1% complete: The operation can still be aborted (ctrl-c for options)
\ 10% complete: The operation can still be aborted (ctrl-c for options)
```

TFTP Services and Image Size

Some Cisco IOS XR images may be larger than 32 MB, and the TFTP services provided by some vendors (such as Sun Solaris) 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.
- Use a third-party or freeware TFTP server that supports file sizes larger than 32 MB.

Download a patch from Sun Microsystems to correct this limitation (<http://www.sun.com>).

Adding tar Files

Use the **tar** keyword to add one or more PIE files in the tar file format. If the **tar** keyword is used, only a single tar file can be added.



Note

Multiple tar files or a combination of PIE and tar files is not supported.

Note the following regarding tar files:

- The *file* filename must include the complete location of the tar file.
- The tar file can contain only PIE files and directories containing PIE files. For example:
 - The tar file pies.tar containing the files x.tar and y.pie fails because x.tar is not a PIE file.
 - The tar file pies.tar containing the file x.pie and the directory dir_a, where dir_a contains a PIE file y.pie succeeds.
 - The tar file pies.tar containing the file x.pie and the directory dir_a, where dir_a contains a tar file y.tar fails because y.tar is not a PIE file.
 - The tar file pies.tar containing the PIE files x.pie, y.pie, ...*.pie succeeds.
- The **source** keyword is not supported with the **tar** keyword.

Following is a valid example of using the **tar** keyword:

```
RP/0/0/CPU0:router(admin)# install add tar tftp://223.255.254.254/install/files/pies.tar
```

You can add and activate tar files at the same time. In other words, the **install add** command is supported using the **tar** and the **activate** keywords simultaneously.

Adding Multiple Packages

To add multiple PIE files, use the **source** keyword to specify the directory path location of the PIE files. Then list all the PIE filenames, as necessary. This alleviates the need to repeat the directory location for each PIE file. Following is an example of the **install add** command using the **source** keyword:

```
RP/0/0/CPU0:router(admin)# install add source tftp://192.168.201.1/images/myimages/  
comp-hfr-mini.pie hfr-mgbl-p.pie hfr-mpls-p.pie hfr-mcast-p.pie
```

The following example also illustrates a valid use of the **install add** command with the **source** keyword:

```
RP/0/0/CPU0:router(admin)# install add source tftp://192.168.254.254/images/user/  
hfr-mcast-p.pie pies/hfr-mpls-p.pie ftp://1.2.3.4/other_location/hfr-mgbl-p.pie
```

In the above example, three PIE files are added from the following locations:

- tftp://192.168.254.254/images/user/hfr-mcast-p.pie
- tftp://192.168.254.254/images/user/pies/hfr-mpls-p.pie
- ftp://1.2.3.4/other_location/hfr-mgbl-p.pie

Parallel Reload

Installation operations are activated according to the method encoded in the package being activated. Generally, this method has the least impact for routing and forwarding purposes, but it may not be the fastest method from start to finish and can require user interaction by default. To perform the installation procedure as quickly as possible, you can specify the **parallel-reload** keyword. This forces the installation to perform a parallel reload, so that all cards on the router reload simultaneously, and then come up with the new software. This impacts routing and forwarding, but it ensures that the installation is performed without other issues.

Pausing Activation Before Configuration Lock

If you specify the **activate** keyword, use the **pause sw-change** keywords to pause the software activation operation before locking the configuration. A software activation operation begins with preparatory steps, such as software checks, and then proceeds with the actual activation of the new software. The configuration is locked for the activation. 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 activation whenever you choose. This is useful, for

example, if your workflow involves configuring a router out of the network during software installation 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	execute

Examples

The following example shows how to add a PIE file for all SDRs in the system. In the following example, a Multiprotocol Label Switching (MPLS) package is added in synchronous mode. This operation copies the files required for the package to the storage device. This package remains inactive until it is activated with the **install activate** command.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install add tftp://209.165.201.1/hfr-mpls.pie synchronous

Install operation 4 'install add /tftp://209.165.201.1/hfr-mpls.pie synchronous' started
by user
'user_b' at 03:17:05 UTC Mon Nov 14 2005.
Info:      The following package is now available to be activated:
Info:
Info:      disk0:hfr-mpls-3.3.80
Info:
Install operation 4 completed successfully at 03:18:30 UTC Mon Nov 14 2005.
```

In the following example, a package is added and activated on all SDRs with a single command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install add disk1:hfr-mgbl-p.pie-3.4.0 activate
Install operation 4 'install add /disk1:hfr-mgbl-p.pie-3.4.0 activate' started
by user 'user_b' at 07:58:56 UTC Wed Mar 01 2006.
The install operation will continue asynchronously.
:router(admin)#Part 1 of 2 (add software): Started
Info:      The following package is now available to be activated:
Info:
Info:      disk0:hfr-mgbl-3.4.0
Info:
Part 1 of 2 (add software): Completed successfully
Part 2 of 2 (activate software): Started
Info:      The changes made to software configurations will not be persistent across
system reloads. Use the command 'admin install
Info:      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
Part 2 of 2 (activate software): Completed successfully
Part 1 of 2 (add software): Completed successfully
Part 2 of 2 (activate software): Completed successfully
Install operation 4 completed successfully at 08:00:24 UTC Wed Mar 01 2006.
```

Related Commands

Command	Description
install activate	Adds a software package or SMU 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 EXEC or 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.

Defaults The command operates in synchronous mode.

Command Modes EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.4.0	Support was added for EXEC mode.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 failover 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:hfr-mcast-3.7.6
```

```
Install operation 14 'install activate disk0:hfr-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/RP0/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
and router running configuration.
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:hfr-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 a software package or SMU to the active software set.
	install add	Adds the contents of a PIE file to a storage device.
	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 EXEC or administration EXEC mode.

install auto-abort-timer stop [*sdr list-of-sdr-names*]

Syntax Description

sdr <i>list-of-sdr-names</i>	(Optional. Administration EXEC mode only) Deactivates the auto-abort-timer for a specific secure domain router (SDR). The value of the <i>list-of-sdr-names</i> argument can be one or more names assigned to various SDRs. To specify more than one SDR, list each SDR name separated by a space.

Defaults

When activated, the auto-abort-timer runs to expiration and then loads the last committed loadpath.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

Command Modes

- Enter the **install auto-abort-timer stop** command in administration EXEC mode to halt the auto-abort-timer for all secure domain routers (SDRs).
- Enter the **install auto-abort-timer stop** command in EXEC mode to halt the auto-abort-timer operations for the SDR to which you are logged in.

install auto-abort-timer stop**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 a software package or SMU 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 boot-options

To set boot options for a specified node, use the **install boot-options** command. Boot options include formatting and cleaning the disk in the specified node during the boot process.

install boot-options {clean | format} location node

Syntax Description	clean	Cleans the card installed in the specified node during the next reboot.
	format	Formats the card installed in the specified node during the next reboot.
	location node-id	Specifies a node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.

Defaults	No default behavior or values

Command Modes	Administration EXEC

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

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Use the **install boot-options** command to clean or format a card during the next reboot. This command affects only the next reboot that a user initiates. To initiate a reboot during which the boot option you set will be applied, reboot the card from a disk in another node. You can use the **hw-module location reload** command with the *path* argument to download a boot image using TFTP from a remote node. When the reboot is complete, the boot options are reset.

Cisco XR 12000 Series Router,

Use the **install boot-options** command to clean or format a card during the next reboot. This command affects only the next reboot that a user initiates. To initiate a reboot during which the boot option you set will be applied, reboot the card from a disk in another node. To reboot from a remote node, connect to the console port of the card and perform a tftpboot from ROM Monitor. When the reboot is complete, the boot options are reset.

Task ID	Task ID	Operations
	pkg-mgmt	read, write

Examples

The following example shows how to set the card located in node 0/0/CPU0 to be cleaned during the next reboot:

```
RP/0/RP0/CPU0:router(admin)# install boot-options clean location 0/0/CPU0
```

```
Install operation 7 '(admin) install boot-options clean location 0/0/CPU0'
started by user '' via CLI at 09:15:46 GMT Mon Mar 10 2008.
Info:      The boot option will be in effect when the node is reloaded and will
Info:      be cleared when the node preparation is complete.
Install operation 7 completed successfully at 09:15:46 GMT Mon Mar 10 2008.
RP/0/0/CPU0:router(admin)#
```

The following example shows how to set the card located in node 0/0/CPU0 to be formatted during the next reboot:

```
RP/0/RP0/CPU0:router(admin)# install boot-options format location 0/0/CPU0
```

```
Install operation 8 '(admin) install boot-options format location 0/0/CPU0'
started by user '' via CLI at 09:15:52 GMT Mon Mar 10 2008.
Info:      The boot option will be in effect when the node is reloaded and will
Info:      be cleared when the node preparation is complete.
Install operation 8 completed successfully at 09:15:52 GMT Mon Mar 10 2008.
RP/0/0/CPU0:router(admin)#
```

Related Commands	Command	Description
	clear install boot-options	Clears boot options.
	hw-module location (Cisco CRS-1)	Performs a reload of a single node or all nodes in the system.
	reload (administration EXEC)	Performs a reload of a single node or all nodes in the system.
	show install boot-options	Displays boot options.

install commit

To save the active software set to be persistent across designated system controller (DSC) reloads, use the **install commit** command in EXEC or administration EXEC mode.

Administration EXEC Mode

```
install commit [admin-profile | sdr sdr-name]
```

EXEC Mode

```
install commit
```

Syntax Description

admin-profile	(Optional. Administration EXEC mode only) Commits the active software set on the admin profile only.
sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only) Commits the active software set for a specific SDR. The <i>sdr-name</i> argument is the name assigned to the secure domain router (SDR).

Defaults

Administration EXEC Mode

Commits the active software set for all SDRs.

EXEC Mode

Commits the active software set for the current SDR.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	No modification.
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

When a package is activated, it becomes part of the current running configuration. To make the package activation persistent across 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.

- To commit the active software set for a specific SDR from administration EXEC mode, use the **install commit** command with the **sdr sdr-name** keyword and argument.
- To commit the active software set for all SDRs in the system, use the **install commit** command without keywords or arguments in administration EXEC mode.

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 committed	Displays committed active packages.
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 EXEC or administration EXEC mode.

Administration EXEC Mode

```
install deactivate {id add-id [add-id2 ... add-id16] | device:package [device:package2 ...
device:package32]} [auto-abort-timer minutes] [sdr sdr-name] [location node-id]
[asynchronous | synchronous] [parallel-reload] [prompt-level {default | none}] [test]
[pause sw-change]
```

EXEC Mode

```
install deactivate {id add-id [add-id2 ... add-id16] | device:package [device:package2 ...
device:package32]} [auto-abort-timer minutes] [location node-id] [asynchronous |
synchronous] [parallel-reload] [prompt-level {default | none}] [test] [pause sw-change]
```

Syntax Description		
id <i>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.
<i>device:package</i>		Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-3.4.0). For the <i>device</i> argument, the value is a specified storage device, typically disk0: . Press ? after a partial package name to display all possible matches available for activation. If there is only one match, press [TAB] to fill in the rest of the package name.
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.
sdr <i>sdr-name</i>		(Optional. Administration EXEC mode only) Deactivates a package for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
location <i>node-id</i>		(Optional) Deactivates a package from the designated node. The <i>node-id</i> argument is entered in <i>rack/slot/module</i> notation. Note In most cases, a package cannot be deactivated from a node, because some version of that package must be running on all supported nodes after the deactivation operation finishes.
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 deactivation. While the operation is paused, you can perform configuration changes. You control the resumption of the operation at the CLI prompt.

Defaults

Administration EXEC Mode

- The package is deactivated on all supported nodes for all SDRs in the system.
- The operation is performed in asynchronous mode: The **install deactivate** command runs in the background, and the EXEC prompt is returned as soon as possible.

EXEC Mode

- The package is deactivated on all supported nodes for the SDR.
- The operation is performed in asynchronous mode: that is, the **install deactivate** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	Support was added for the sdr keyword and <i>sdr-name</i> argument. Support was added for the noprompt keyword.
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	Support was added for the auto-abort-timer keyword.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for the pause sw-change keywords and the id keyword.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Deactivating a package removes the activated package from the active software set from all nodes or from a single node. 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.
- To downgrade a package, activate the older version. The newer package version is deactivated automatically.

Specifying Packages to Deactivate

You can either use the **id** keyword and *add-id* 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.

Deactivating a Package for All Secure Domain Routers (SDRs)

To deactivate a package for all SDRs in the system, use the **install deactivate** command in administration EXEC mode.



Note

To enter administration EXEC mode, you must be logged in to the owner SDR, and have root-system access privileges.

Deactivating a Package for a Specific SDR

- To deactivate a package for a specific SDR from administration EXEC mode, use the **install deactivate** command with the **sdr** keyword and *sdr-name* argument.
- To deactivate a package when logged into an SDR, use the **install deactivate** command in EXEC mode.

Router Reloads

If the deactivation requires a router reload, a confirmation prompt appears. Use the **install deactivate** command with the **prompt-level none** keywords to automatically ignore any reload confirmation prompts and proceed with the package deactivation. The router reloads if required.

Node Reloads

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.

Synchronous Operation

Use the **install deactivate** command with the **synchronous** keyword to complete the operation before the prompt is returned. A progress bar indicates the status of the operation. For example:

```
- 1% complete: The operation can still be aborted (ctrl-c for options)
\ 10% complete: The operation can still be aborted (ctrl-c for options)
```

Test Option

Use the **test** keyword to verify the effects of the deactivation without making changes to the system. Use this option to determine if the deactivation 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.

Auto Abort Option

Use the **auto-abort-timer** keyword to provide a safety mechanism for the instance that a package is deactivated and for some reason access to the router is lost. This option automatically rolls back to the current committed loadpath, thereby undoing any changes that are deactivated with the **install deactivate** command. After the installation, if the activated software is working correctly, use the **install commit** command to cancel the timer and commit the new loadpath.

Use the **install commit** command to make changes persistent across route processor (RP) reloads.

Pausing Before Configuration Lock

Use the **pause sw-change** keywords to pause the operation before locking the configuration. The deactivation operation begins with preparatory steps, such as software checks, and then proceeds with the actual deactivation. The configuration is locked for the actual deactivation. 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 deactivation whenever you choose. This is useful, for example, if your workflow involves configuring a router out of the network during software changes 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	execute

Examples

The following example shows how to display the packages available for deactivation using the online help system. In this example, ? is entered after a partial package name to display all possible matches.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install deactivate disk0:?

disk0:comp-hfr-mini-3.4.0  disk0:hfr-admin-3.4.0  disk0:hfr-base-3.4.0
disk0:hfr-diags-3.4.0
disk0:hfr-fwdg-3.4.0      disk0:hfr-k9sec-3.4.0  disk0:hfr-lc-3.4.0
disk0:hfr-mcast-3.4.0
disk0:hfr-mgbl-3.4.0     disk0:hfr-mps-3.4.0   disk0:hfr-os-mpi-3.4.0.1
I disk0:hfr-rout-3.4.0
```

The following example shows how to deactivate a package on all supported nodes in all SDRs. The operation is performed in synchronous mode.

```
RP/0/RP0/CPU0:router(admin)# install deactivate disk0:hfr-mpls-3.4.0 synchronous
```

```
Install operation 14 'install deactivate disk0:hfr-mpls-3.4.0 synchronous'
started by user 'user_b' at 18:38:37 UTC Sat Apr 08 2006.
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
Install operation 14 completed successfully at 18:39:20 UTC Sat Apr 08 2006.
```

In the following example, the Security package is deactivated for the SDR named “LR1”:

```
RP/0/RP0/CPU0:router(admin)# install deactivate disk0:hfr-k9sec-3.4.0 sdr LR1
```

```
Install operation 11 'install deactivate disk0:hfr-k9sec-3.4.0 on SDR: LR1'
started by user 'user_b' at 03:25:26 est Thu Mar 02 2006.
```

- 1% complete: The operation can still be aborted (ctrl-c for options)

The install operation will continue asynchronously.

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 11 completed successfully at 03:25:56 est Thu Mar 02 2006.
```

You cannot deactivate a package if other packages or nodes require that package. In the following example, an attempt to deactivate a package is rejected:

```
RP/0/RP1/CPU0:router(admin)# install deactivate disk0:hfr-diags-3.3.90 location 0/6/cpu0
```

```
Install operation 25 'install deactivate disk0:hfr-diags-3.3.90 on node
0/6/CPU0' started by user 'user_b' at 23:01:38 UTC Sat Apr 15 2006.
Error:      Cannot proceed with the deactivation because of the following package
Error:      incompatibilities:
Error:          hfr-diags-3.3.90 on nodes of type RP needs hfr-diags-3.3.90, or
Error:          equivalent, to be active on node 0/6/CPU0 on secure domain router
Error:          Owner.
Error:          hfr-diags-3.3.90 on nodes of type DRP needs hfr-diags-3.3.90, or
Error:          equivalent, to be active on node 0/6/CPU0 on secure domain router
Error:          Owner.
Error:          hfr-diags-3.3.90 on nodes of type SP needs hfr-diags-3.3.90, or
Error:          equivalent, to be active on node 0/6/CPU0 on secure domain router
Error:          Owner.
Error:          hfr-diags-3.3.90 on nodes of type LC needs hfr-diags-3.3.90, or
Error:          equivalent, to be active on node 0/6/CPU0 on secure domain router
Error:          Owner.
Error:      Suggested steps to resolve this:
Error:          - check the installation instructions.
Error:          - activate or deactivate the specified packages on the specified
```

```
Error:      nodes.
Install operation 25 failed at 23:01:44 UTC Sat Apr 15 2006.
```

The following example shows how to deactivate a package, pausing the operation before locking the configuration for the actual software deactivation. While the operation is paused, you can enter a configuration mode and perform configurations. When you want to complete the operation, you enter the **install operation id complete** command, or **install operation id attach synchronous**.

```
RP/0/0/CPU0:router(admin)# install deactivate disk0:comp-c12k-3.8.0.07I.CSCsr09575-1.0.0
pause sw-change

Install operation 12 '(admin) install deactivate
disk0:comp-c12k-3.8.0.07I.CSCsr09575-1.0.0 pause sw-change' started by user 'admin' via
CLI at 09:06:26 BST Mon Jul 07 2008.
Info: This operation will reload the following nodes in parallel:
Info: 0/0/CPU0 (RP) (SDR: Owner)
Info: 0/1/CPU0 (LC(E3-GE-4)) (SDR: Owner)
Info: 0/5/CPU0 (LC(E3-OC3-POS-4)) (SDR: Owner)
Proceed with this install operation (y/n)? [y]
The install operation will continue asynchronously.
RP/0/0/CPU0:ensoft-gsr13(admin)#Info: Install Method: Parallel Reload
Info: Install operation 12 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 '(admin) install operation 12 complete'.
Info: - run the command '(admin) install operation 12 attach synchronous' and then answer
the query.
RP/0/0/CPU0:router(admin)#
```

In the following example, the operation is synchronous and the **pause sw-change** keywords are used to pause the operation before configuration lock. In this case, you are prompted to enter one of three options at the pause stage: **abort/complete/cli**. If you enter **abort**, the operation is aborted. If you enter **complete**, the operation is immediately resumed. If you enter **cli**, the CLI prompt returns, enabling you to perform configurations before resuming the operation. Alternatively, you can leave the prompt open while you open a separate CLI session to perform configurations. Then, you can return to the prompt and enter **complete** when you are ready to resume the operation.

```
RP/0/0/CPU0:router# install deactivate disk0:c12k-firewall-3.8.0.10I sync pause sw-change

Wed Jul 23 14:42:11.273 UTC
Install operation 8 'install deactivate disk0:c12k-firewall-3.8.0.10I synchronous pause
sw-change' started by user 'salevy' on SDR
Owner via CLI at 14:42:12 UTC Wed Jul 23 2008.
Info:   Install Method: Parallel Process Restart
The install operation has paused before the configuration is locked as requested by user 'salevy'.
Please perform any changes to the configuration that are required before the operation is to
continue.
How should the operation continue?
Abort the operation (abort)
Lock the config and complete the operation (complete)
Suspend the operation and return to the Command Line Interface (cli)
Please confirm an option (abort/complete/cli): [complete] cli
Use the command 'install operation 8 ?' to find how to continue the operation.

RP/0/0/CPU0:router# install operation 8 ?

  abort  Abort the operation
  attach Attach to the operation
  complete Phase to run to end of

RP/0/0/CPU0:router# install operation 8 complete
```

```
Wed Jul 23 14:43:04.562 UTC
RP/0/0/CPU0:router#Info:  Install operation 8 has been resumed.
Info:  The changes made to software configurations will not be persistent across system reloads.
Use the command ' (admin)
Info:  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 8 completed successfully at 14:43:53 UTC Wed Jul 23 2008.
```

Command	Description
install activate	Adds a software package or SMU to the active software set.
install commit	Makes the current active software set persistent across RP reloads.
install remove	Removes a deactivated package from a storage device.
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 EXEC or 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.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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**

Labels and descriptions defined in administrative EXEC mode are visible only in administrative EXEC mode. Labels and descriptions defined in EXEC mode for an SDR are visible only in EXEC mode.

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:
 - all
 - summary
 - brief
 - detail
 - verbose
 - active
 - inactive
 - committed
 - location
 - sdr
 - label
 - rollback
 - install
 - differences
 - to
 - from
 - asynchronous
 - synchronous
 - force
 - noprompt
 - test
 - label-name
 - description
- 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 a software package or SMU to the active software set.

install remove

To delete inactive packages from a storage device, use the **install remove** command in EXEC or administration EXEC mode.

Administration EXEC Mode

```
install remove {id add-id [add-id2 ... add-id16] | device:package [device:package2 ...  
device:package32] | inactive} [sdr sdr-name] [prompt-level {default | none}] [asynchronous  
| synchronous] [test]
```

EXEC Mode

```
install remove {id add-id [add-id2 ... add-id16] | device:package [device:package2 ...  
device:package32] | inactive} [prompt-level {default | none}] [asynchronous | synchronous]  
[test]
```

Syntax Description		
id <i>add-id</i>		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.
<i>device:package</i>		Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-3.4.0). For the <i>device</i> argument, the value is a specified storage device, typically disk0 .
		Note Multiple packages can be removed at the same time.
inactive		Removes all inactive, noncommitted packages from the boot device (usually disk0).
sdr <i>sdr-name</i>		(Optional. Administration EXEC mode only) Removes a package for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
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.
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.
test		(Optional) Verifies the effects of proposed operations without making changes to the Cisco IOS XR software.

Defaults

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

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	Support was added to enable removal of multiple packages at the same time and to enable removal of inactive packages from a storage device.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	Support was added for the noprompt keyword.
Release 3.4.0	Support was added for EXEC mode. The install remove inactive command removes inactive packages only from the boot device (usually Disk0).
Release 3.5.0	No modification.
Release 3.6.0	The prompt-level keyword replaced the noprompt keyword.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for the id keyword.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

**Note**

Only inactive packages can be removed. (Packages cannot be in the active or committed software set.)

- To remove all inactive packages from the boot device (usually **disk0:**), use the **install remove inactive** command.
- To remove a specific inactive package from a storage device, use the **install remove device:package** command.

**Note**

When removing all inactive packages from the boot device, use the **show version**, **show install active**, or **show install committed** command to determine the device used as the boot device.

- To remove all packages that were added in one or more specific **install add** operations, use the **id** keyword and *add-id* 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.

Command Modes

- To remove packages from all SDRs, use the **install remove** command in administration EXEC mode.
- To remove packages from a specific SDR, use the **install remove** command in EXEC mode.
- To remove all inactive packages from the boot device in the system or SDR, use the **install remove inactive** command.



Note

A package can be removed from a single SDR only if the package was not added to any other SDRs.

Router Reloads

If the operation requires a router reload, a confirmation prompt appears. Use the **install remove** command with the **prompt-level none** keywords to automatically ignore any reload confirmation prompts and proceed with the package removal. The router reloads if required.

Test Operation

Use the **test** keyword to verify the effects of the package removal operation and determine whether the 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.



Note

When removing a package, note that the **install remove** command ignores secure domain router (SDR) boundaries and performs the operation in global scope.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to remove a specific inactive package. In this example, the operation is run in test mode. The operation is then confirmed and the package is removed.

```
RP/0/RP1/CPU0:router# admin
RP/0/RP1/CPU0:router(admin)# install remove disk0:hfr-diags-3.3.90 test

Install operation 30 'install remove disk0:hfr-diags-3.3.90 test' started by
user 'user_b' at 23:40:22 UTC Sat Apr 15 2006.
Warning: No changes will occur due to 'test' option being specified. The
Warning: following is the predicted output for this install command.
Info: This operation will remove the following package:
Info: disk0:hfr-diags-3.3.90
Info: After this install remove the following install rollback points will
Info: no longer be reachable, as the required packages will not be present:
Info: 4, 9, 10, 14, 15, 17, 18
Proceed with removing these packages? [confirm] y
```

The install operation will continue asynchronously.
Install operation 30 completed successfully at 23.

The following example shows how to remove all inactive packages from the boot device. This example is for a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# install remove inactive synchronous

RP/0/0/CPU0:Aug 15 09:25:41.020 : instdir[198]:
%INSTALL-INSTMGR-6-INSTALL_OPERATION_STARTED :
Install operation 8 '(admin) install remove inactive' started by user 'user_b'
Install operation 8 '(admin) install remove inactive' started by user 'user_b' at
09:25:41 UTC Tue Aug 15 2006.
Info:      This operation will remove the following package:
Info:      disk0:c12k-compmgmt__installmgr-0.0.5
Proceed with removing these packages? [confirm]
The install operation will continue asynchronously.
```

Related Commands

Command	Description
install add	Adds the contents of a PIE file to a storage device.
show install log	Displays the entries stored in the logging installation buffer.
show install inactive	Displays the inactive packages for one or more SDRs.
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 EXEC or administration EXEC mode.

Administration EXEC Mode

```
install rollback to {point-id | label | committed} [auto-abort-timer time] [sdr sdr-name]
[admin-profile] [asynchronous | synchronous] [parallel-reload] [prompt-level {default |
none}] [test] [pause sw-change]
```

EXEC Mode

```
install rollback to {point-id | label | committed} [auto-abort-timer time] [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.
sdr <i>sdr-name</i>	(Optional) Rolls back the software set for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR. This option is in administration EXEC mode only.
admin-profile	(Optional) Rolls back the active software set on the admin profile only. This option is in administration EXEC mode only.
asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, this command runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.
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.

Defaults

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

EXEC
Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	Support was added to enable rollback to a saved installation point.
Release 3.2	This command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	Support was removed for the reload keyword. Support was added for the noprompt keyword.
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	No modification.
Release 3.6.0	Support was added for the prompt-level and parallel-reload keywords. Support was removed for the noprompt keyword.
Release 3.7.0	No modification.
Release 3.8.0	Support was added for the pause sw-change keywords.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **install rollback** 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, the 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** 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** 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** 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.

Rolling Back the Software Set for a Specific SDR

- To roll back the software set for a specific SDR from administration EXEC mode, use the **install rollback** command with the **sdr** keyword and *sdr-name* argument.
- To roll back the software set when logged into an SDR, use the **install rollback** command in EXEC mode.

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

```

install rollback to

```
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/0/0/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
'salevy' on SDR Owner via CLI at 15:37:54 UTC
Wed Jul 23 2008.
The install operation will continue asynchronously.
RP/0/0/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/0/0/CPU0:router# install operation 16 complete
```

```
Wed Jul 23 15:38:35.197 UTC
RP/0/0/CPU0:Test_GSR#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)
Info:    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/0/0/CPU0:router#
```

Related Commands

Command	Description
clear install rollback oldest	Deletes saved installation points from the installation buffer.
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.
show install rollback	Displays the software set associated with a saved installation point.

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 EXEC or administration EXEC mode.

```
install verify healthcheck [asynchronous | synchronous] [admin-profile] [sdr sdr-name]
[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.
	sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.) Performs the command for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
	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/module</i> notation.
	repair	(Optional) Repairs anomalies found by the install verify healthcheck process.

Defaults 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 EXEC
Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

Verifying the Software Set for a Specific SDR

- To verify the processes for a specific SDR from administration EXEC mode, use the **install verify healthcheck** command with the **sdr** keyword and *sdr-name* argument.
- To verify the software set when logged into an SDR, use the **install verify healthcheck** command in EXEC mode.

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 'debbie' 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: 3.3.7
```

```

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 3.3.2.
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.

install verify packages

To verify the consistency of a previously installed software set with the package file from which it originated, use the **install verify packages** command in EXEC or administration EXEC mode.

Administration EXEC Mode

install verify packages [**sdr** *sdr-name*] [**repair**] [**location** *node-id*] [**admin-plane**] [**asynchronous** | **synchronous**]

EXEC Mode

install verify packages [**repair**] [**location** *node-id*] [**asynchronous** | **synchronous**]

Syntax Description

sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.) Performs the command for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
repair	(Optional) Repairs anomalies found by the install verify packages process.
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/module</i> notation.
admin-plane	(Optional) Verify the admin profile only.
asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, this command runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.

Defaults

The operation is performed in asynchronous mode: The **install verify packages** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.1	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.2	No modification.
Release 3.3.0	Support was added for the sdr keyword and <i>sdr-name</i> argument.
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	This command was changed from install verify .
Release 3.6.0	No modification.

Release	Modification
Release 3.7.0	This command was extended to check for corruptions in installation state files and MBI image files.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **install verify packages** command to verify the consistency of a previously installed software set with the package file from which it originated. This command can be used as a debugging tool to verify the validity of the files that constitute the packages to determine if there are any corrupted files. This command also checks for corruptions of install state files and MBI image files. This command is particularly useful when issued after the activation of a package or when upgrading the Cisco IOS XR software to a major release.



Note

The **install verify packages** command can take up to two minutes per package to process.

Verifying the Software Set for a Specific SDR

- To verify the software set for a specific SDR from administration EXEC mode, use the **install verify packages** command with the **sdr** keyword and *sdr-name* argument.
- To verify the software set when logged into an SDR, use the **install verify packages** command in EXEC mode.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to verify the consistency of a previously installed software set with the package file from which it originated:

```
RP/0/RP0/CPU0:router# install verify packages
```

```
Install operation 2 '(admin) install verify packages' started by user 'admin' via CLI at 07:35:01 UTC Wed May 14 2008.
```

```
Info: This operation can take up to 2 minutes per package being verified. Please be patient.
```

```
Info: 0/3/CPU0 [LC] [SDR: Owner]
```

```
Info: meta-data: [SUCCESS] Verification Successful.
```

```
Info: /install/hfr-lc-3.8.0.02I: [SUCCESS] Verification Successful.
```

```
Info: /install/hfr-fwg-3.8.0.02I: [SUCCESS] Verification Successful.
```

```
Info: /install/hfr-admin-3.8.0.02I: [SUCCESS] Verification Successful.
```

```
Info: /install/hfr-base-3.8.0.02I: [SUCCESS] Verification Successful.
```

```
Info: /install/hfr-os-mpi-3.8.0.02I: [SUCCESS] Verification Successful.
```

```
Info: 0/SM1/SP [SP] [Admin Resource]
```

```
Info: meta-data: [SUCCESS] Verification Successful.
```

```
Info: /install/hfr-admin-3.8.0.02I: [SUCCESS] Verification Successful.
```

```
Info: /install/hfr-base-3.8.0.02I: [SUCCESS] Verification Successful.
```

install verify packages

```

Info: /install/hfr-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/3/SP [SP] [Admin Resource]
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/hfr-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/RP1/CPU0 [RP] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/hfr-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-rout-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/RP0/CPU0 [RP] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/hfr-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/hfr-rout-3.8.0.02I: [SUCCESS] Verification Successful.
Info: Verification Summary:
Info: 0/3/CPU0: SUCCESSFUL. No anomalies found.
Info: 0/SM1/SP: SUCCESSFUL. No anomalies found.
Info: 0/3/SP: SUCCESSFUL. No anomalies found.
Info: 0/RP1/CPU0: SUCCESSFUL. No anomalies found.
Info: 0/RP0/CPU0: SUCCESSFUL. No anomalies found.
Info: The system needs no repair.
Install operation 2 completed successfully at 07:46:29 UTC Wed May 14 2008.

```

Related 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

To display active packages, use the **show install** command in EXEC or administration EXEC mode.

Administration EXEC Mode

show install [**detail** | **summary** | **verbose**] [**sdr** *sdr-name* | **location** *node-id*]

EXEC Mode

show install [**detail** | **summary** | **verbose**] [**location** *node-id*]

Syntax Description		
summary	(Optional)	Displays a summary of the active packages in a system or secure domain router. Use this command to display the default software profile for SDRs
detail	(Optional)	Displays a detailed summary of the active packages for a system, secure domain router, or node.
verbose	(Optional)	Displays a detailed summary of the active packages for a system, secure domain router, or node, including component and file information for each package.
sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.)	Displays the active packages for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
location <i>node-id</i>	(Optional)	Displays the active packages for a designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
	Release 3.3.0	Support was added for the optional keywords and arguments: sdr <i>sdr-name</i> , detail , summary , and verbose .
	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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

**Note**

This command displays output that is similar to the **show install active** command.

Use the **show install** command to display the active software set for all nodes, or for specific nodes. Enter the command in administration EXEC mode to display information for all nodes in all SDRs.

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** keyword and *sdr-name* argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.

Displaying Information for a Specific Node

Use the **location** keyword and *node-id* argument to display information for a specific node. If you do not specify a location with the **location** keyword and *node-id* argument, this command displays information from all nodes.

Summary, Detailed, and Verbose Information

Use the **summary** keyword to display a summary of the active packages in a system or SDR. Use the **detail** keyword to display the active packages for each node in an SDR, or in all SDRs. Use the **verbose** keyword to display additional information, including component and file information for each package.

**Note**

This command displays output that is similar to the **show install** command.

Displaying the Default SDR Software Profile

When an SDR is created, the nodes assigned to that SDR are configured with the default software profile. To view a summary of the default SDR software configuration, enter the **show install summary** command in administration EXEC mode. Any new nodes that are configured to become a part of an SDR boot with the default software profile listed in the output of this command.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

Use the **location node-id** keyword and argument to display the active packages for a designated node:

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

```
Secure Domain Router: Owner
```

```
Node 0/0/CPU0 [RP] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/c12k-os-mbi-3.6.0/mbiprp-rp.vm
```



```

Active Packages:
  disk0:c12k-mini-3.6.0

Node 0/6/CPU0 [LC(E3-OC3-POS-4)] [SDR: Owner]
  Boot Device: mem:
  Boot Image: /disk0/c12k-os-mbi-3.6.0/gsr/ucode/mbiprp-lc.ucode
  Active Packages:
    disk0:c12k-mini-3.6.0

```

Use the **summary** keyword to display a summary of the active packages in the system. This command also shows the default software profile used for new SDRs.

```
RP/0/RP0/CPU0:router# show install summary
```

```

Default Profile:
  SDRs:
    Owner
    sdr1
  Active Packages:
    disk0:c12k-diags-3.4.0
    disk0:c12k-mgbl-3.4.0
    disk0:c12k-mcast-3.4.0
    disk0:c12k-mp1s-3.4.0
    disk0:c12k-k9sec-3.4.0
    disk0:c12k-mini-3.4.0

```

Table 85 describes the significant fields shown in the display.

Table 85 *show install Field Descriptions*

Field	Description
Boot Device	Device 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 a software package or an SMU to the active software set.
show install active	Displays active software packages.
show install package	Displays information about a package.
show install pie-info	Displays information about the packages contained in a PIE file.
show install which	Displays the origin of a component, package, or file.

show install active

To display active packages, use the **show install active** command in EXEC or administration EXEC mode.

Administration EXEC Mode

show install active [**detail** | **summary** | **verbose**] [**sdr** *sdr-name* | **location** *node-id*]

EXEC Mode

show install active [**detail** | **summary** | **verbose**] [**location** *node-id*]

Syntax Description		
summary	(Optional) Displays a summary of the active packages in a system or secure domain router.	
detail	(Optional) Displays a detailed summary of the active packages for a system, secure domain router, or node.	
verbose	(Optional) Displays a detailed summary of the active packages for a system, secure domain router, or node, including component information for each package.	
sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.) Displays the active packages for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.	
location <i>node-id</i>	(Optional) Displays the active packages for a designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.	

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. The detail keyword was added.
	Release 3.3.0	Support was added for the optional keywords and arguments: sdr <i>sdr-name</i> , summary , and verbose .
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.

Release	Modification
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



Note

This command displays output that is similar to the **show install** command.

Use the **show install active** command to display the active software set for all nodes, or for specific nodes. Enter the command in administration EXEC mode to display information for all nodes in all SDRs.

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** keyword and *sdr-name* argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.

Displaying Information for a Specific Node

Use the **location** keyword and *node-id* argument to display information for a specific node. If you do not specify a location with the **location** keyword and *node-id* argument, this command displays information from all nodes.

Summary, Detailed, and Verbose Information

Use the **summary** keyword to display a summary of the active packages in a system or SDR. Use the **detail** keyword to display the active packages for each node in an SDR, or in all SDRs. Use the **verbose** keyword to display additional information, including component and file information for each package.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following is sample output from the **show install active** command with the **location** keyword and *node-id* argument specified:

```
RP/0/RP0/CPU0:router(admin)# show install active location 0/1/cpu0
```

```
Node 0/1/CPU0 [LC] [SDR: Owner]
Boot Image: /disk0/hfr-os-mbi-3.4.0/lc/mbihfr-lc.vm
Active Packages:
  disk0:hfr-pagent-3.4.0
  disk0:hfr-diags-3.4.0
  disk0:hfr-mcast-3.4.0
  disk0:hfr-mpls-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

The following is sample output from the **show install active** command with the **summary** keyword specified:

```
RP/0/RP0/CPU0:router(admin)#show install active summary
```

```
Default Profile:
```

```
SDRs:
```

```
Owner
```

```
CE1b
```

```
Active Packages:
```

```
disk0:hfr-diags-3.4.0
```

```
disk0:hfr-mgbl-3.4.0
```

```
disk0:hfr-k9sec-3.4.0
```

```
disk0:comp-hfr-mini-3.4.0
```

The following is sample output from the **show install active summary** command for a specific SDR:

```
RP/0/RP0/CPU0:router(admin)# show install active summary sdr owner
```

```
Active Packages:
```

```
disk0:hfr-diags-3.4.0
```

```
disk0:hfr-mgbl-3.4.0
```

```
disk0:hfr-k9sec-3.4.0
```

```
disk0:comp-hfr-mini-3.4.0
```

The following is sample output from the **show install active** command for a specific SDR:

```
RP/0/RP0/CPU0:router(admin)#show install active SDR Owner
```

```
Secure Domain Router: Owner
```

```
Node 0/1/CPU0 [LC] [SDR: Owner]
```

```
Boot Device: mem:
```

```
Boot Image: /disk0/hfr-os-mbi-3.6.0.16I/lc/mbihfr-lc.vm
```

```
Active Packages:
```

```
disk0:hfr-pagent-3.6.0.16I
```

```
disk0:hfr-fpd-3.6.0.16I
```

```
disk0:hfr-diags-3.6.0.16I
```

```
disk0:hfr-mcast-3.6.0.16I
```

```
disk0:hfr-mpis-3.6.0.16I
```

```
disk0:comp-hfr-mini-3.6.0.16I
```

```
Node 0/4/CPU0 [DRP] [SDR: Owner]
```

```
Boot Device: disk0:
```

```
Boot Image: /disk0/hfr-os-mbi-3.6.0.16I/drp/mbihfr-drp.vm
```

```
Active Packages:
```

```
disk0:hfr-pagent-3.6.0.16I
```

```
disk0:hfr-fpd-3.6.0.16I
```

```
disk0:hfr-doc-3.6.0.16I
```

```
disk0:hfr-diags-3.6.0.16I
```

```
disk0:hfr-mgbl-3.6.0.16I
```

```
disk0:hfr-mcast-3.6.0.16I
```

```
disk0:hfr-mpis-3.6.0.16I
```

```
disk0:hfr-k9sec-3.6.0.16I
```

```
disk0:comp-hfr-mini-3.6.0.16I
```

```
Node 0/4/CPU1 [DRP] [SDR: Owner]
```

```
Boot Device: disk0:
```

```
Boot Image: /disk0/hfr-os-mbi-3.6.0.16I/drp/mbihfr-drp.vm
```

```
Active Packages:
```

```
disk0:hfr-pagent-3.6.0.16I
```

```
disk0:hfr-fpd-3.6.0.16I
```

```
disk0:hfr-doc-3.6.0.16I
```

```

disk0:hfr-diags-3.6.0.16I
disk0:hfr-mgbl-3.6.0.16I
disk0:hfr-mcast-3.6.0.16I
disk0:hfr-mppls-3.6.0.16I
disk0:hfr-k9sec-3.6.0.16I
disk0:comp-hfr-mini-3.6.0.16I

Node 0/6/CPU0 [LC] [SDR: Owner]
  Boot Device: mem:
  Boot Image: /disk0/hfr-os-mbi-3.6.0.16I/lc/mbihfr-lc.vm
  Active Packages:
    disk0:hfr-pagent-3.6.0.16I
    disk0:hfr-fpd-3.6.0.16I
    disk0:hfr-diags-3.6.0.16I
    disk0:hfr-mcast-3.6.0.16I
    disk0:hfr-mppls-3.6.0.16I
    disk0:comp-hfr-mini-3.6.0.16I

Node 0/RP0/CPU0 [RP] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/hfr-os-mbi-3.6.0.16I/mbihfr-rp.vm
  Active Packages:
    disk0:hfr-pagent-3.6.0.16I
    disk0:hfr-fpd-3.6.0.16I
    disk0:hfr-doc-3.6.0.16I
    disk0:hfr-diags-3.6.0.16I
    disk0:hfr-mgbl-3.6.0.16I
    disk0:hfr-mcast-3.6.0.16I
    disk0:hfr-mppls-3.6.0.16I
    disk0:hfr-k9sec-3.6.0.16I
    disk0:comp-hfr-mini-3.6.0.16I

Node 0/RP1/CPU0 [RP] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/hfr-os-mbi-3.6.0.16I/mbihfr-rp.vm
  Active Packages:
    disk0:hfr-pagent-3.6.0.16I
    disk0:hfr-fpd-3.6.0.16I
    disk0:hfr-doc-3.6.0.16I
    disk0:hfr-diags-3.6.0.16I
    disk0:hfr-mgbl-3.6.0.16I
    disk0:hfr-mcast-3.6.0.16I
    disk0:hfr-mppls-3.6.0.16I
    disk0:hfr-k9sec-3.6.0.16I
    disk0:comp-hfr-mini-3.6.0.16I

```

Table 86 describes the significant fields shown in the display.

Table 86 *show install active Field Descriptions*

Field	Description
Boot Device	Device 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.

 show install active

Related Commands	Command	Description
	install activate	Adds a software package or an SMU to the active software set.
	show install	Displays active software packages.
	show install package	Displays information about a package.
	show install pie-info	Displays information about the packages contained in a PIE file.
	show install which	Displays the origin of a component, package, or file.

show install audit

To compare the current active packages and SMUs on the router with a list of packages and SMUs that should be active, use the **show install audit** command in EXEC or administration EXEC mode.

Administration EXEC Mode

```
show install audit file file-name [sdr sdr-name | location node-id] [verbose]
```

EXEC Mode

```
show install audit file file-name [location node-id] [verbose]
```

Syntax Description	file <i>file-name</i>	Specifies the location and name of the installation audit file.
	sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.) Audits the active packages on a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
	location <i>node-id</i>	(Optional) Audits the active packages on a designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
	verbose	(Optional) Displays a detailed summary of the audit and can be used for troubleshooting.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Use the **show install audit** command to compare the currently active packages and SMUs on the router with a list of packages and SMUs that should be active. The file should be a simple text file with a flat list of packages that should be active on the router. It should be placed in a location accessible from the router.

Note the following about the audit file:

- Each package or SMU name must be on a separate line.



Note

For accurate results, make sure that every line in the audit file, including the last line, is terminated with a line break.

- Comments are allowed and must begin with the pound character: #
- SMUs can be specified with a package name only; regular packages should be specified as “package-version”. For SMUs, if a version is not specified, the default version of “1.0.0” is used.
- Composite package names are allowed
- PIE extensions are allowed at the end of the package name, and they are stripped off.
- The maximum number of lines in a file is limited to 100; the maximum length of each line is limited to 256 characters.

Following are the contents of a valid audit file:

```
# R3.4.1
# some comments
#
comp-hfr-mini-3.4.1
hfr-mgbl-3.4.1
hfr-mcast-3.4.1
hfr-mpls-3.4.1
hfr-base-3.4.1.CSCek42760
hfr-base-3.4.1.CSCse14607
hfr-mpls-3.4.1.CSCse00294
comp-hfr-3.4.1.CSCsd07147
```

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** keyword and *sdr-name* argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.

Displaying Information for a Specific Node

Use the **location** keyword and *node-id* argument to display information for a specific node. If you do not specify a location with the **location** keyword and *node-id* argument, this command displays information for all nodes.

Verbose Information

Use the **verbose** keyword to display additional information, including component and file information for each package.

Command Output

Output from the **show install audit** command provides the following information regarding the audit:

1. The command finishes successfully, and the result of the audit is success. This means that all packages listed in the audit file are active, and there are no extra packages active on all nodes where the audit was requested. This can refer to the entire router, a particular SDR, or a particular node.
2. The command completes successfully, and the result of the audit is failure. Audit failure means that there are discrepancies between the set of packages listed in the audit file and the packages active on the nodes where audit is done.

The following additional messages indicate the type discrepancy found in the audit:

- A package specified in the audit file is not present at all. In other words, there was no **install add** performed for this package.
 - A package specified in the audit file is present, but is not active on all nodes where it should be active. For example, a package that goes only to RPs is not active on all RPs audited (either the entire router or a specific SDR, depending on the scope of command).
 - A package specified in the audit file is present, but is not active on some nodes where it should be active. In this case, a list is provided of the nodes where the package is not active.
 - An extra package that is not present in the audit file is active on all nodes being audited.
 - An extra package that is not present in the audit file is active on some nodes being audited. In this case, a list is provided of the nodes where the package is active.
3. The command did not finish successfully, due to various errors. This can happen due to a failure to parse the audit file, failure to get package information from the installation directory, and so on.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following sample output indicates that the audit is successful:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# show install audit file tftp://10.2.2.2/install_list.txt

Install audit operation completed.
Install audit result: SUCCESS
```

The following sample output indicates that there are discrepancies between the packages installed on the router and the supplied audit file:

```
RP/0/RP0/CPU0:router(admin)# show install audit file tftp://10.2.2.2/install_list.txt

Info:      Package (hfr-base-3.2.4.CSCxx12345) is not active only on node(s) 0/5/CPU0,
Info:      0/3/CPU0.
Install audit operation completed.
Install audit result: FAILED (discrepancies found)
```

Related Commands

Command	Description
install activate	Adds a software package or an SMU to the active software set.
show install active	Displays active software packages.

Command	Description
show install package	Displays information about a package.
show install pie-info	Displays information about the packages contained in a PIE file.
show install which	Displays the origin of a component, package, or file.

show install auto-abort-timer

To display the current auto-abort-timer, use the **show install auto-abort-timer** command in EXEC or administration EXEC mode.

show install auto-abort-timer

Syntax Description	This command has no arguments or keywords.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

The **show install auto-abort-timer** displays the timer value configured with the **install activate** and **install deactivate** commands.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples	The following sample output displays the current auto-abort-timer value:

```
RP/0/RP0/CPU0:router# show install auto-abort-timer
```

```
No Auto Abort Timer(s) present
```

 show install auto-abort-timer

Related Commands	Command	Description
	install activate	Adds a software package or an SMU to the active software set.
	install deactivate	Removes a package from the active software set.

show install boot-options

To display the boot options set for a specified location or for all locations, use the **show install boot-options** command in administration EXEC mode or EXEC mode.

show install boot-options [*location node-id* | **all**]

Syntax Description	location node-id	Specifies a node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.
	all	Displays boot options for all locations.

Defaults	If no location is specified, the show install boot-options command displays boot options for all locations.

Command Modes	Administration EXEC EXEC

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Use the **show install boot-options** command to display boot options that were set using the **install boot-options** command.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples	The following example shows how to display the boot options for all locations:

```
RP/0/RP0/CPU0:router(admin)# show install boot-options
```

```
Node                               Boot Options
-----+-----
0/1/SP                             no boot options set.
0/1/CPU0                           no boot options set.
```

show install boot-options

```
0/4/SP                no boot options set.
0/4/CPU0              no boot options set.
0/4/CPU1              no boot options set.
0/6/SP                no boot options set.
0/6/CPU0              no boot options set.
0/RP0/CPU0            no boot options set.
0/RP1/CPU0            no boot options set.
0/SM0/SP              no boot options set.
0/SM1/SP              no boot options set.
0/SM2/SP              no boot options set.
0/SM3/SP              no boot options set.
```

Related Commands

Command	Description
clear install boot-options	Clears boot options.
install boot-options	Sets boot options.

show install committed

To display committed software packages, use the **show install committed** command in EXEC or administration EXEC mode.

Administration EXEC Mode

show install committed [**detail** | **summary** | **verbose**] [**sdr** *sdr-name* | **location** *node-id*]

EXEC Mode

show install committed [**detail** | **summary** | **verbose**] [**location** *node-id*]

Syntax Description		
summary	(Optional)	Displays a summary of the committed packages in a system or SDR.
detail	(Optional)	Displays a detailed summary of the committed packages for a system, SDR, or node.
verbose	(Optional)	Displays a detailed summary of the committed packages for a system, SDR, or node, including component and file information for each package.
sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.)	Displays the committed packages for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
location <i>node-id</i>	(Optional)	Displays the committed packages for a designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.

Defaults	Enter the command without keywords or arguments to display detailed information for all nodes in the SDR or system.

Command Modes	Administration EXEC EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
	Release 3.3.0	This command was supported in both EXEC mode and administration EXEC mode. Support was removed for the all keyword. Support was added for the keywords and arguments: sdr <i>sdr-name</i> , detail , summary , and verbose .
	Release 3.4.0	No modification.

■ **show install committed**

Release	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.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

When a software package is activated, it remains active only until the next router reload. To save the active software to be persistent across router reloads, use the **install commit** command.

Use the **show install committed** command to display the packages included in the committed software set. This is useful for verifying that the desired set of packages is committed.

Use the **show install** command to display the committed software packages for all nodes, or for specific nodes.

Enter the **show install committed** command in administration EXEC mode to display information for all nodes in all SDRs.

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** keyword and *sdr-name* argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.

Displaying Information for a Specific Node

Use the **location** keyword and *node-id* argument to display information for a specific node. If you do not specify a location with the **location** keyword and *node-id* argument, this command displays information from all nodes.

Summary, Detailed, and Verbose Information

Use the **summary** keyword to display summary of packages in a system or SDR. Use the **detail** keyword to display the packages for each node in an SDR, or in all SDRs. Use the **verbose** keyword to display additional information, including component and file information for each package.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

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

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# show install committed summary
Default Profile:
  SDRs:
    Owner
```



```
Committed Packages:
 disk0:hfr-pagent-3.4.0
 disk0:hfr-diags-3.4.0
 disk0:hfr-mgbl-3.4.0
 disk0:hfr-mcast-3.4.0
 disk0:hfr-mps-3.4.0
 disk0:hfr-k9sec-3.4.0
 disk0:comp-hfr-mini-3.4.0
```

The following is sample output from the **show install committed** command. Enter the command without keywords or arguments to display detailed information for all nodes in the SDR or system:

```
RP/0/RP0/CPU0:router# show install committed
```

```
Secure Domain Router: Owner
```

```
Node 0/1/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

```
Node 0/1/CPU0 [LC] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/lc/mbihfr-lc.vm
 Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

```
Node 0/6/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

```
Node 0/6/CPU0 [LC] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/lc/mbihfr-lc.vm
 Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

```
Node 0/RP0/CPU0 [RP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/mbihfr-rp.vm
 Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:hfr-mgbl-3.4.0
  disk0:hfr-k9sec-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

```
Node 0/RP1/CPU0 [RP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/mbihfr-rp.vm
 Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:hfr-mgbl-3.4.0
  disk0:hfr-k9sec-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

```
Node 0/SM0/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:comp-hfr-mini-3.4.0
```

```
Node 0/SM1/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
```

show install committed

```

Committed Packages:
  disk0:hfr-diags-3.4.0
  disk0:comp-hfr-mini-3.4.0

Node 0/SM2/SP [SP] [SDR: Owner]
  Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
  Committed Packages:
    disk0:hfr-diags-3.4.0
    disk0:comp-hfr-mini-3.4.0

Node 0/SM3/SP [SP] [SDR: Owner]
  Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
  Committed Packages:
    disk0:hfr-diags-3.4.0
    disk0:comp-hfr-mini-3.4.0

```

Table 87 describes the significant fields shown in the display.

Table 87 *show install committed Field Descriptions*

Field	Description
Boot Image	Location on the dSC of the active minimum boot image (MBI) used to boot the node.
Committed Packages	Active packages committed on the node.

Related Commands

Command	Description
install activate	Adds a software package or SMU to the active software set.
install commit	Makes the current active software set persistent across RP reloads.
show install	Displays active software packages.
show install active	Displays active software packages.
show install package	Displays information about a package.
show install pie-info	Displays information about the packages contained in a PIE file.
show install which	Displays the origin of a component, package, or file.

show install inactive

To display the inactive packages on the designated secure domain router system controller (DSDRSC) for one or more secure domain routers (SDRs), use the **show install inactive** command in EXEC or administration EXEC mode.

Administration EXEC Mode

show install inactive [**detail** | **summary** | **verbose**] [**sdr** *sdr-name* | **location** *node-id*]

EXEC Mode

show install inactive [**detail** | **summary** | **verbose**] [**location** *node-id*]

Syntax Description	summary	(Optional) Displays a summary of inactive packages.
	detail	(Optional) Displays summary and component information for inactive packages.
	verbose	(Optional) Displays summary, component, and file information for inactive packages.
	sdr <i>sdr-name</i>	(Optional. Administration EXEC mode only.) Displays the inactive packages for a the boot device in a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR.
	location <i>node-id</i>	(Optional) Displays the inactive software set from a designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. The components , files , and none keywords were removed and replaced by the detail , verbose , and brief keywords, respectively. The summary keyword was removed. The default output display was changed to match the output that displayed when the optional summary keyword was entered in previous releases.
	Release 3.3.0	No modification.

■ **show install inactive**

Release	Modification
Release 3.4.0	This command was modified to display inactive packages only for the boot device.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show install inactive** command to display the inactive packages for the DSDRSC.

**Note**

Use the **show version**, **show install active**, or **show install committed** command to determine the device used as the boot device.

Enter the command in administration EXEC mode to display information for the DSDRSC in all SDRs.

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** keyword and *sdr-name* argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.

Displaying Information for a Specific Node

Use the **location** keyword and *node-id* argument to display information for a specific node. If you do not specify a location with the **location** keyword and *node-id* argument, this command displays information from all nodes.

Summary, Detailed, and Verbose Information

Use the **summary** keyword to display summary of inactive packages in a system or SDR. Use the **detail** keyword to display the packages for each node in an SDR, or in all SDRs. Use the **verbose** keyword to display additional information, including component and file information for each package.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

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

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show install inactive
Secure Domain Router: Owner

Node 0/0/CPU0 [RP] [SDR: Owner]
```

```

Inactive Packages:
  disk0:c12k-compmgmt__installmgr-0.0.5

Node 0/5/CPU0 [LC(E3-OC48-POS)] [SDR: Owner]
Inactive Packages:
  disk0:c12k-rout-3.4.0
  disk0:c12k-compmgmt__installmgr-0.0.5

```

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

```
RP/0/0/CPU0:router(admin)# show install inactive summary
```

```

Default Profile:
  SDRs:
    Owner
  Inactive Packages:
    disk0:c12k-mgbl-3.6.0
    disk0:c12k-fpd-3.6.0

```

The following is sample output from the **show install inactive** command with the **detail** keyword:

```
RP/0/0/CPU0:router(admin)# show install inactive detail
```

```

Secure Domain Router: Owner

Node 0/0/CPU0 [RP] [SDR: Owner]
Inactive Packages:
  disk0:c12k-compmgmt__installmgr-0.0.5

Node 0/5/CPU0 [LC(E3-OC48-POS)] [SDR: Owner]
Inactive Packages:
  disk0:c12k-rout-3.4.0
  disk0:c12k-compmgmt__installmgr-0.0.5

```

The following is sample output from the **show install inactive** command with the **detail** and **location** keywords and *node-id* argument:

```

RP/0/0/CPU0:router(admin)# show install inactive summary location 0/0/CPU0
Node 0/0/CPU0 [RP] [SDR: Owner]
Inactive Packages:
  disk0:c12k-compmgmt__installmgr-0.0.5

RP/0/0/CPU0:router(admin)# show install inactive summary location 0/5/CPU0
Node 0/5/CPU0 [LC(E3-OC48-POS)] [SDR: Owner]
Inactive Packages:
  disk0:c12k-rout-3.4.0
  disk0:c12k-compmgmt__installmgr-0.0.5

```

Table 88 describes the significant fields shown in the display.

Table 88 *show install inactive Field Descriptions*

Field	Description
disk0:hfr-mgbl-3.4.0	Storage device and the name of the package that is inactive.
hfr-mgbl V3.4.0 Manageability Package	Name of the package that is inactive.
Vendor	Name of the manufacturer.
Desc	Name of the package.

Table 88 *show install inactive Field Descriptions (continued)*

Field	Description
Build	The date and time when the inactive package was built.
Source	The source directory where the inactive package was built.

Related Commands

Command	Description
install deactivate	Removes a package from the active software set.
show install package	Displays information about a package.
show install pie-info	Displays information about the packages contained in a PIE file.
show install which	Displays the origin of a component, package, or file.

show install log

To display the details of installation *requests*, use the **show install log** command in EXEC or administration EXEC mode.

show install log [*install-id* | **from** *install-id*] [**detail** | **verbose**] [**reverse**]

Syntax Description	<i>install-id</i>	(Optional) Identifier assigned to an installation operation.
	from <i>install-id</i>	(Optional) Displays information for logs from the specified installation identifier and forward.
	detail	(Optional) Displays detailed including impact to processes and nodes.
	verbose	(Optional) Displays the information from the keyword, plus additional information regarding impacts to files, processes, and dynamic link libraries (DLLs).
	reverse	(Optional) Displays the logs in reverse order.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
	Release 3.3.0	Support was added for the detail and verbose keywords.
	Release 3.4.0	Support was added for EXEC mode.
	Release 3.5.0	No modification.
	Release 3.6.0	Support was added for the from and reverse keywords.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Enter the **show install log** command with no arguments to display a summary of all installation operations, including the changes to files and the processes impacted by each request. Specify the *install-id* argument to display details for a specific operation.

The *install-id* argument is listed beside each operation in the **show install log** summary and is attached to messages from that operation. For example, the third installation operation has “Install 3:” attached to all of its status messages.

The **reverse** keyword displays the information from the latest install log to the oldest install log. Use the **from** keyword to limit the output to be from the specified installation identifier and later.

Displaying Information One or More SDRs

- Enter the **show install log** command in EXEC mode to display information for the current SDR. In EXEC mode, this command displays only information for that SDR.
- To display information for all SDRs in the system, enter the **show install log** command in administration EXEC mode.

Summary, Detailed, and Verbose Information

Use the **show install log detail** command to display detailed information for all previous installations, including impact to processes and nodes impacted. The detailed information is a subset of **show install log verbose** information.

Use the **show install log verbose** command to display detailed information for all previous installations, information including files changes, impact to processes, and impact to dynamic link libraries (DLLs).

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following example displays a summary of all installation requests:

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

Install operation 1 started by user 'user_b' at 20:42:57 UTC Mon Aug 28 2006.
  (admin) install add /disk1:hfr-diags-p.pie-3.4.0.SIT-image
  Install operation 1 completed successfully at 20:43:32 UTC Mon Aug 28 2006.

-----

Install operation 2 started by user 'user_b' at 20:45:49 UTC Mon Aug 28 2006.
  (admin) install add /disk1:hfr-k9sec-p.pie-3.4.0.SIT-image
  /disk1:hfr-mcast-p.pie-3.4.0.SIT-image
  /disk1:hfr-mgbl-p.pie-3.4.0.SIT-image
  /disk1:hfr-mppls-p.pie-3.4.0.SIT-image
  /disk1:hfr-pagent-p.pie-3.4.0.SIT-image
  /disk1:hfr-doc.pie-3.4.0.SIT-image
  Install operation 2 completed successfully at 20:48:31 UTC Mon Aug 28 2006.

-----

Install operation 3 started by user 'user_b' at 20:49:34 UTC Mon Aug 28 2006.
  (admin) install activate disk0:hfr-k9sec-3.4.0 disk0:hfr-mcast-3.4.0
  disk0:hfr-mgbl-3.4.0 disk0:hfr-mppls-3.4.0 disk0:hfr-pagent-3.4.0
  disk0:hfr-doc-3.4.0 disk0:hfr-diags-3.4.0
  Install operation 3 completed successfully at 20:52:42 UTC Mon Aug 28 2006.
```



```

-----
Install operation 4 started by user 'user_b' at 20:54:32 UTC Mon Aug 28 2006.
(admin) install commit
Install operation 4 completed successfully at 20:54:34 UTC Mon Aug 28 2006.
-----

```

4 entries shown

The following example displays the details for a specific installation request. Use the **detail** keyword to display additional information regarding the impact of the operation to processes and nodes:

```
RP/0/RP0/CPU0:router(admin)# show install log 2 detail
```

```

Install operation 3 started by user 'user_b' at 20:49:34 UTC Mon Aug 28 2006.
(admin) install activate disk0:hfr-k9sec-3.4.0 disk0:hfr-mcast-3.4.0
disk0:hfr-mgbl-3.4.0 disk0:hfr-mppls-3.4.0 disk0:hfr-pagent-3.4.0
disk0:hfr-doc-3.4.0 disk0:hfr-diags-3.4.0
Install operation 3 completed successfully at 20:52:42 UTC Mon Aug 28 2006.

```

Summary:

```

Install method: parallel
Summary of changes on nodes 0/1/SP, 0/6/SP, 0/SM0/SP, 0/SM1/SP, 0/SM2/SP,
0/SM3/SP:
    Activated:      hfr-diags-3.4.0
                   hfr-pagent-3.4.0
    No processes affected
Summary of changes on nodes 0/1/CPU0, 0/6/CPU0:
    Activated:      hfr-diags-3.4.0
                   hfr-mcast-3.4.0
                   hfr-mppls-3.4.0
                   hfr-pagent-3.4.0
    1 hfr-mppls processes affected (0 updated, 1 added, 0 removed, 0
impacted)
    2 hfr-mcast processes affected (0 updated, 2 added, 0 removed, 0
impacted)
Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
    Activated:      hfr-diags-3.4.0
                   hfr-doc-3.4.0
                   hfr-k9sec-3.4.0
                   hfr-mcast-3.4.0
                   hfr-mgbl-3.4.0
                   hfr-mppls-3.4.0
                   hfr-pagent-3.4.0
    7 hfr-mgbl processes affected (0 updated, 7 added, 0 removed, 0
impacted)
    8 hfr-mppls processes affected (0 updated, 8 added, 0 removed, 0
impacted)
    7 hfr-k9sec processes affected (0 updated, 7 added, 0 removed, 0
impacted)
    14 hfr-mcast processes affected (0 updated, 14 added, 0 removed, 0
impacted)

```

Install logs:

```

Install operation 3 '(admin) install activate disk0:hfr-k9sec-3.4.0
disk0:hfr-mcast-3.4.0 disk0:hfr-mgbl-3.4.0 disk0:hfr-mppls-3.4.0
disk0:hfr-pagent-3.4.0 disk0:hfr-doc-3.4.0 disk0:hfr-diags-3.4.0'
started by user 'user_b' at 20:49:34 UTC Mon Aug 28 2006.
Info:      The changes made to software configurations will not be
Info:      persistent across system reloads. Use the command 'admin install
Info:      commit' to make changes persistent.
Info:      Please verify that the system is consistent following the

```

■ show install log

```

Info:      software change using the following commands:
Info:      show system verify
Info:      install verify
Install operation 3 completed successfully at 20:52:42 UTC Mon Aug 28 2006.

```

The following example displays information for the installation requests. Use the **verbose** keyword to display detailed information, including files changes, impact to processes, and impact to dynamic link libraries (DLLs).

```
RP/0/RP0/CPU0:router(admin)# show install log 2 verbose
```

```

Install operation 3 started by user 'user_b' at 20:49:34 UTC Mon Aug 28 2006.
(admin) install activate disk0:hfr-k9sec-3.4.0 disk0:hfr-mcast-3.4.0
disk0:hfr-mgbl-3.4.0 disk0:hfr-mppls-3.4.0 disk0:hfr-pagent-3.4.0
disk0:hfr-doc-3.4.0 disk0:hfr-diags-3.4.0
Install operation 3 completed successfully at 20:52:42 UTC Mon Aug 28 2006.

```

Summary:

```

Install method: parallel
Summary of changes on nodes 0/1/SP, 0/6/SP, 0/SM0/SP, 0/SM1/SP, 0/SM2/SP,
0/SM3/SP:
    Activated:      hfr-diags-3.4.0
                   hfr-pagent-3.4.0
    No processes affected
Summary of changes on nodes 0/1/CPU0, 0/6/CPU0:
    Activated:      hfr-diags-3.4.0
                   hfr-mcast-3.4.0
                   hfr-mppls-3.4.0
                   hfr-pagent-3.4.0
    1 hfr-mppls processes affected (0 updated, 1 added, 0 removed, 0
impacted)
    2 hfr-mcast processes affected (0 updated, 2 added, 0 removed, 0
impacted)
Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
    Activated:      hfr-diags-3.4.0
                   hfr-doc-3.4.0
                   hfr-k9sec-3.4.0
                   hfr-mcast-3.4.0
                   hfr-mgbl-3.4.0
                   hfr-mppls-3.4.0
                   hfr-pagent-3.4.0
    7 hfr-mgbl processes affected (0 updated, 7 added, 0 removed, 0
impacted)
    8 hfr-mppls processes affected (0 updated, 8 added, 0 removed, 0
impacted)
    7 hfr-k9sec processes affected (0 updated, 7 added, 0 removed, 0
impacted)
    14 hfr-mcast processes affected (0 updated, 14 added, 0 removed, 0
impacted)

```

Install logs:

```

Install operation 3 '(admin) install activate disk0:hfr-k9sec-3.4.0
disk0:hfr-mcast-3.4.0 disk0:hfr-mgbl-3.4.0 disk0:hfr-mppls-3.4.0
disk0:hfr-pagent-3.4.0 disk0:hfr-doc-3.4.0 disk0:hfr-diags-3.4.0'
started by user 'user_b' at 20:49:34 UTC Mon Aug 28 2006.
Info:      The changes made to software configurations will not be
Info:      persistent across system reloads. Use the command 'admin install
Info:      commit' to make changes persistent.
Info:      Please verify that the system is consistent following the
Info:      software change using the following commands:
Info:      show system verify
Info:      install verify

```

```
Install operation 3 completed successfully at 20:52:42 UTC Mon Aug 28 2006.
```

Installation changes:

```
Installation changes on nodes 0/1/SP, 0/6/SP, 0/SM0/SP, 0/SM1/SP, 0/SM2/SP,
0/SM3/SP:
```

```
Adding executable: online_diag_hfr_sp
Adding file: ad_diags_online_ns_cfg__api.configinfo
Adding DLL: libdiagrpclnt.dll
Adding DLL: libdiagrpvr.dll
Adding DLL: libdiagmain.dll
Adding DLL: libdiagobfl.dll
Adding DLL: libdiagutil.dll
Adding file: online_diag_hfr_sp.startup
Replacing file: package_compatibility
Replacing file: md5_manifest
```

```
Installation changes on nodes 0/1/CPU0, 0/6/CPU0:
```

```
Adding executable: ipv4_mfwd_ha_timer_handler
Adding and starting process: ipv4_mfwd_partner
Adding executable: ipv6_mfwd_ha_timer_handler
Adding and starting process: ipv6_mfwd_partner
Adding executable: online_diag_hfr_lc
Adding executable: tgn_server
Adding and starting process: ucp_lctrl_server
Adding file: ad_diags_online_ns_cfg__api.configinfo
Adding file: lo_mfwd_ns_cfg__api.configinfo
Adding file: lo_mfwdv6_ns_cfg__api.configinfo
Adding file: sh_mfwd_ns_cfg__api.configinfo
Adding file: sh_mfwdv6_ns_cfg__api.configinfo
Adding DLL: lib_ipv4_mfwd_bag_desc.dll
Adding DLL: lib_ipv6_mfwd_bag_desc.dll
Adding DLL: libdiagrpclnt.dll
Adding DLL: libdiagrpvr.dll
Adding DLL: libdiagmain.dll
Adding DLL: libdiagobfl.dll
Adding DLL: libdiagutil.dll
Adding DLL: libipv4_mcast_gtrie.dll
Adding DLL: libipv4_mcast_gtrie_debug.dll
Adding DLL: libipv4_mcast_tables.dll
Adding DLL: libipv4_mcast_tw.dll
Adding DLL: libipv4_mfwd_netio.dll
```

```
--More--
```

The following example displays all installation requests in reverse order, such that the most recent requests are displayed first:

```
RP/0/RP0/CPU0:router(admin)# show install log reverse
```

```
Install operation 2 started by user 'user_a' via CLI at 12:33:10 GMT Mon Oct 29 2007.
```

```
(admin) install add /tftp://xx-tftp/user_a/c12k-fpd.pie
```

```
Install operation 2 completed successfully at 12:35:19 GMT Mon Oct 29 2007.
```

```
Install operation 1 started by user 'user_a' via CLI at 12:31:07 GMT Mon Oct 29 2007.
```

```
(admin) install add /tftp://xx-tftp/user_a/c12k-mgbl.pie
```

```
Install operation 1 completed successfully at 12:32:12 GMT Mon Oct 29 2007.
```

 show install log

Related Commands	Command	Description
	install activate	Adds a software package or SMU to the active software set.
	install add	Adds the contents of a PIE file to a storage device.
	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 a storage device.
	install rollback to	Rolls back the software set to a saved installation point or to the last committed installation point.
	install verify packages	Verifies the consistency of a previously installed software set with the package file from which it originated.

show install package

To display information about a package, use the **show install package** command in EXEC or administration EXEC mode.

show install package {*device:package* | **all**} [**brief** | **detail** | **verbose**]

Syntax Description	<i>device:package</i>	Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-3.4.0). For the <i>device</i> argument, the value is a specified storage device, typically disk0: .
	all	Displays all installed packages on the system or SDR.
	brief	(Optional) Displays only the name and version of packages.
	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 regarding dynamic link libraries (DLLs).

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode. The components , files , and none keywords were removed and replaced by the detail , verbose , and brief keywords, respectively. The summary keyword was removed. The default output display was changed to match the output that displayed when the optional summary keyword was entered in previous releases.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show install package all** command to display a list of the packages on the router or SDR.

Use the **show install package** 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** with the **verbose** keyword to display the same information as the **detail** keyword, plus additional information regarding dynamic link libraries (DLLs).

**Note**

This command returns the same data in EXEC mode and administration EXEC mode. In EXEC mode, only the information for the current SDR is displayed.

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 all** command lists all packages available on the router:

```
RP/0/0/CPU0:PE7_C12406(admin)# show install package all
```

```
disk0:c12k-mini-3.4.0
  disk0:c12k-admin-3.4.0
  disk0:c12k-base-3.4.0
  disk0:c12k-fwdg-3.4.0
  disk0:c12k-lc-3.4.0
  disk0:c12k-os-mbi-3.4.0
  disk0:c12k-rout-3.4.0
```

```
disk0:c12k-mgbl-3.4.0
```

```
disk0:c12k-mp1s-3.4.0
```

```
disk0:c12k-diags-3.4.0
```

```
disk0:c12k-k9sec-3.4.0
```

```
disk0:c12k-mcast-3.4.0
```

The following sample output from the **show install package device:package** command lists all the packages contained in a composite package:

```
RP/0/RP0/CPU0:router(admin)# show install package disk0:comp-hfr-full-3.4.0
```

```
disk0:comp-hfr-full-3.4.0
  disk0:hfr-rout-3.4.0
  disk0:hfr-mcast-3.4.0
```

```

disk0:hfr-mpis-3.4.0
disk0:hfr-lc-3.4.0
disk0:hfr-fwg-3.4.0
disk0:hfr-admin-3.4.0
disk0:hfr-base-3.4.0
disk0:hfr-os-mbi-3.4.0

```

The following sample shows output from the **show install package** command with the **detail** keyword:

```

RP/0/0/CPU0:router(admin)# show install package disk0:c12k-mgbl-3.3.1 detail

disk0:c12k-mgbl-3.3.1
  c12k-mgbl V3.3.1[Default]  manageability
  Vendor   : Cisco Systems
  Desc     : manageability
  Build    : Built on Mon Jun 26 11:08:42 UTC 2006
  Source   : By iox28.cisco.com in /auto/ioxws57/nightly/r33x_12000_06.06.26 fo8
  Card(s)  : RP
  Restart information:
    Default:
      parallel impacted processes restart
  Components in package disk0:c12k-mgbl-3.3.1, package  c12k-mgbl:
    emweb V[r33x/1]  Agranat/Virata Emweb embedded web server
    ipsla V[r33x/1]  IP SLA Agent (formerly known as Service Assurance Agen)
    cfg-sh-mgbl V[r33x/1]  LR shared plane manageability config
    doc-hfr-mgbl V[r33x/2]  Contains the man page documentation for HFR mans
    snmp-pingmib V[r33x/1]  Ping Management Information Base (MIB)
    man-xml-infra V[r33x/1]  Generic infrastructure for XML support
    snmp-assetmib V[r33x/1]  CISCO ASSET Management Information Base (MIB)
    package-compat V[r33x/1]  This is to collect package^Mcompatibility infs
    package-manage V[r33x/6]  This is to collect package^Mcompatibility infe
    snmp-sensormib V[r33x/1]  Sensor Management Information Base (MIB)
    man-xml-cli-ops V[r33x/1]  Handler for XML which contains CLI requests
    man-xml-mda-ops V[r33x/1]  Handler for XML which contains MDA requests
    snmp-disman-mib V[r33x/1]  Event MIB Implementation
    generic-xmlagent V[r33x/1]  Generic XML Agent
    man-xml-ttyagent V[r33x/1]  XML Telnet/SSH agent
    snmp--disman-mib V[r33x/1]  EXPRESSION-MIB implementation
    snmp-bulkfilemib V[r33x/1]  Bulk File Management Information Base (MIB)
    man-xml-alarm-ops V[r33x/1]  The XML Operations Provider for alarms.
    snmp-ftpclientmib V[r33x/1]  FTP Client Management Information Base (MI)
    c12000-iox-mgb-cwi V[r33x/2]  Craft Web Interface related binaries and e
    man-xml-cfgmgr-ops V[r33x/1]  Handler for XML which contains CfgMgr reqs
    manageability-perf V[r33x/1]  Performance Management Component for Manay
    snmp-assetmib-enhi V[r33x/2]  CISCO ENHANCED IMAGE MIB
    snmp-frucontrolmib V[r33x/2]  CISCO-FRU-CONTROL MIB Implementation in EA

```

Table 89 describes the significant fields shown in the display.

Table 89 *show install package Field Descriptions*

Field	Description
disk0:hfr-rout-3.4.0	Storage device and the name of the package that has been installed.
hfr-rout V3.4.0 Routing Package	Name of the package.
Vendor	Name of the manufacturer.
Desc	Name of the package.
Build	Date and time the package was built.
Source	Source directory where the package was built.

Table 89 *show install package Field Descriptions (continued)*

Field	Description
Card(s)	Card types supported by the package.
Restart information	Restart impact on processes or nodes.
Components in package	Components included in the package.

Related Commands

Command	Description
show install	Displays active software packages.
show install active	Displays active software packages.
show install committed	Displays committed 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 pie-info	Displays information about the packages contained in a PIE file.
show install which	Displays the origin of a component, package, or file.

show install pie-info

To display information about a Package Installation Envelope (PIE) installation file, use the **show install pie-info** command in EXEC or administration EXEC mode.

show install pie-info *device:package* [**brief** | **detail** | **verbose**]

Syntax Description	<i>device:package</i>	Device, directory path, and package, expressed in concatenated form.
	brief	(Optional) Displays summary information.
	detail	(Optional) Displays detailed information.
	verbose	(Optional) Displays comprehensive information.

Defaults	Displays summary information.

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
	Release 3.3.0	Support was added for the keywords detail , and verbose .
	Release 3.4.0	Support was added for EXEC mode. The summary keyword was replaced by the brief keyword.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> .

Use the **show install pie-info** command to display information about a specified PIE installation file.

Task ID	Task ID	Operations
	pkg-mgmt	read

Examples

The following is sample output from the **show install pie-info** command. The default display shows the package name, expiration date, and file size.

```
RP/0/RP0/CPU0:router(admin)# show install pie-info disk1:/hfr-mgbl-p.pie-3.4.0

Contents of pie file '/disk1:/hfr-mgbl-p.pie-3.4.0':
  Expiry date       : Jan 19, 2007 02:55:56 UTC
  Uncompressed size : 17892613

  hfr-mgbl-3.4.0
```

**Note**

[Table 90 on page 855](#) describes the significant fields shown in the sample output.

The following is sample output from the **show install pie-info detail** command. This command displays additional information including vendor, build date supported cards and component information:

```
RP/0/RP0/CPU0:router(admin)# show install pie-info disk1:/hfr-mgbl-p.pie-3.4.0 detail

Contents of pie file '/disk1:/hfr-mgbl-p.pie-3.4.0':
  Expiry date       : Jan 19, 2007 02:55:56 UTC
  Uncompressed size : 17892613

  hfr-mgbl-3.4.0
    hfr-mgbl V3.4.0[00]  Manageability Package
    Vendor   : Cisco Systems
    Desc     : Manageability Package
    Build    : Built on Wed May 10 08:04:58 UTC 2006
    Source   : By edde-bld1 in /vws/aga/production/3.4.0/hfr/workspace for c28
    Card(s)  : RP, DRP, DRPSC
    Restart information:
      Default:
        parallel impacted processes restart
    Components in package hfr-mgbl-3.4.0, package hfr-mgbl:
      manageability-cwi V[r33x/2]  Craft Web Interface related binaries ae
      hfr-feature-ipsla V[r33x/1]  IPSLA time stamping feature
      doc-hfr-mgbl V[r33x/2]  Contains the man page documentation for HFRs
      emweb V[r33x/1]  Agranat/Virata Emweb embedded web server
      generic-xmlagent V[r33x/1]  Generic XML Agent
      ipsla V[r33x/1]  IP SLA Agent (formerly known as Service Assurance )
      manageability-perf V[r33x/1]  Performance Management Component for y
      man-xml-alarm-ops V[r33x/1]  The XML Operations Provider for alarms.
      man-xml-cfgmgr-ops V[r33x/1]  Handler for XML which contains CfgMgrs
      man-xml-cli-ops V[r33x/1]  Handler for XML which contains CLI reques
      man-xml-infra V[r33x/1]  Generic infrastructure for XML support
      man-xml-mds-ops V[r33x/1]  Handler for XML which contains MDA reques
      man-xml-ttyagent V[r33x/1]  XML Telnet/SSH agent
      cfg-sh-mgbl V[r33x/1]  LR shared plane manageability config
      package-compat V[r33x/1]  This is to collect package^Mcompatibilitys
      package-manage V[r33x/3]  This is to collect package^Mcompatibilitye
      snmp-assetmib V[r33x/1]  CISCO ASSET Management Information Base (M)
      snmp-bulkfilemib V[r33x/1]  Bulk File Management Information Base (I)
      snmp-assetmib-enhi V[r33x/1]  CISCO ENHANCED IMAGE MIB
      snmp-disman-mib V[r33x/1]  Event MIB Implementation
      snmp--disman-mib V[r33x/1]  EXPRESSION-MIB implementation
      snmp-frucontrolmib V[r33x/1]  CISCO-FRU-CONTROL MIB Implementation A
      snmp-ftpclientmib V[r33x/1]  FTP Client Management Information Base()
      snmp-pingmib V[r33x/1]  Ping Management Information Base (MIB)
      snmp-sensormib V[r33x/1]  Sensor Management Information Base (MIB)
```

The following is sample output from the **show install pie-info verbose** command. This command displays the same information as the **detail** keyword, plus additional information regarding components, processes and DLLs:

```
RP/0/RP0/CPU0:router(admin)# show install pie-info disk1:/hfr-mgbl-p.pie-3.4.0 verbose
```

```
Contents of pie file '/disk1:/hfr-mgbl-p.pie-3.4.0':
```

```
  Expiry date       : Jan 19, 2007 02:55:56 UTC
```

```
  Uncompressed size : 17892613
```

```
hfr-mgbl-3.4.0
```

```
  hfr-mgbl V3.4.0[00]  Manageability Package
```

```
  Vendor : Cisco Systems
```

```
  Desc  : Manageability Package
```

```
  Build : Built on Wed May 10 08:04:58 UTC 2006
```

```
  Source : By edde-bld1 in /vws/aga/production/3.4.0/hfr/workspace for c28
```

```
  Card(s): RP, DRP, DRPSC
```

```
  Restart information:
```

```
    Default:
```

```
      parallel impacted processes restart
```

```
  Components in package hfr-mgbl-3.4.0, package hfr-mgbl:
```

```
    manageability-cwi V[r33x/2]  Craft Web Interface related binaries ae
```

```
      comm.jar
```

```
      comm.jar.nonwindows
```

```
      comm.jar.unix
```

```
      craft.html
```

```
      cwi.xml
```

```
      cwi_definitions.jar
```

```
      cwi_desktop.jar
```

```
      cwi_help.zip
```

```
      cwi_if.jar
```

```
      cwi_ne.jar
```

```
      cwi_tools.jar
```

```
      installer.jar
```

```
      javax.comm.properties
```

```
      jcl.jar
```

```
      libSerial.so.linux
```

```
      librxtxSerial.jnilib.mac
```

```
      man_craft_show
```

```
      man_craft_show.parser
```

```
      orb.jar
```

```
      win32com.dll.win
```

```
hfr-feature-ipsla V[r33x/1]  IPSLA time stamping feature
```

```
  ipsla_ts_svr
```

```
  ipsla_ts_svr.startup
```

```
  libplatform_ipsla_ts.dll
```

```
  show_ipsla_ts.parser
```

```
  show_ipsla_ts_ltrace
```

```
doc-hfr-mgbl V[r33x/2]  Contains the man page documentation for HFRs
```

```
  Fault-Manager-Debug.info
```

```
  Fault-Manager.info
```

```
  IP-Service-Level-Agreement.info
```

```
  Manageability-Debug.info
```

```
  Manageability.info
```

```
  Manageability-Debug.info
```

```
  Manageability.info
```

```
  Performance-Management.info
```

```
emweb V[r33x/1]  Agranat/Virata Emweb embedded web server
```

```
  emweb
```

```
  http_cfg_cmds.parser
```

```
  http_debug_cmds.parser
```

```

httpd.startup
libhttperr.dll
sh_emweb_ns_cfg__api.configinfo

generic-xmlagent V[r33x/1] Generic XML Agent
  cfg_emorb_xmlagent.parser
  sh_xmlagent_ns_cfg__api.configinfo
  xmlagent
  xmlagent.startup

ipsla V[r33x/1] IP SLA Agent (formerly known as Service Assurance )
  cfg_ipsla.parser
  debug_ipsla.parser
  ipsla_app_common_cfg.schema
  ipsla_app_common_oper.schema
  ipsla_ma
  ipsla_ma.startup
  ipsla_op_def_cfg.schema
  ipsla_op_def_common_cfg.schema
  ipsla_op_def_enhanced_cfg.schema
  ipsla_op_def_history_cfg.schema
  ipsla_op_def_hourly_cfg.schema
  ipsla_op_def_icmp_echo_cfg.schema
  ipsla_op_def_icmp_path_echo_cfg.schema
  ipsla_op_def_icmp_path_jitter_cfg.schema
  ipsla_op_def_path_history_cfg.schema
  ipsla_op_def_path_hourly_cfg.schema
  ipsla_op_def_udp_echo_cfg.schema
  ipsla_op_def_udp_jitter_cfg.schema
  ipsla_op_hist_oper.schema
  ipsla_op_hist_path_oper.schema
  ipsla_op_oper.schema
  ipsla_op_react_cfg.schema
  ipsla_op_sched_cfg.schema
  ipsla_op_stats_enhc_oper.schema
  ipsla_op_stats_hrly_d_oper.schema
  ipsla_op_stats_hrly_nd_oper.schema
  ipsla_op_stats_hrly_oper.schema
  ipsla_op_stats_ltst_oper.schema
  ipsla_op_stats_oper.schema
  ipsla_path_setup_test
  ipsla_react_trig_cfg.schema
  ipsla_responder
  ipsla_responder.startup
  ipsla_responder_cfg.schema
  ipsla_responder_oper.schema
  ipsla_sa
  ipsla_sa.startup
  lib_ipsla_app_cm_n_bag_descr.dll
  lib_ipsla_responder_stats_bag_descr.dll
  lib_mgbl_ipsla_oper_bag_descr.dll
  libipsla_error.dll
  libipsla_icmp_echo.dll
  libipsla_icmp_path_echo.dll
  libipsla_icmp_pathjitter.dll
  libipsla_infra.dll
  libipsla_infra_comp.dll
  libipsla_udp_echo.dll
  libipsla_udp_jitter.dll
  libipsla_utils.dll
  librttmonmib.dll
  rttmon.mib
  rttmonmib_cmds.parser
  sh_ipsla_ns_cfg__api.configinfo

```

```
show_ipsla.parser
show_ipsla_common
show_ipsla_ma_ltrace
show_ipsla_resp_ltrace
show_ipsla_resp_stats
show_ipsla_sa_ltrace
show_ipsla_stats

manageability-perf V[r33x/1] Performance Management Component for y
  cfg_perfmgmt.parser
  libperfmgmtbagdesc.dll
  libpm_error.dll
  manageability_perf_cfg_common.schema
  manageability_perf_enable_monitor_cfg.schema
  manageability_perf_enable_stats_cfg.schema
  manageability_perf_enable_thresh_cfg.schema
  manageability_perf_oper.schema
  manageability_perf_stats_cfg.schema
  manageability_perf_thresh_cfg.schema
  monitor_controller
  monitor_interface
  oper_perfmgmt.parser
  perfmgmt_show
  pm_collector
  pm_collector.startup
  pm_server
  pm_server.startup
  sh_perfmgmt_ns_cfg__api.configinfo

man-xml-alarm-ops V[r33x/1] The XML Operations Provider for alarms.
  libxmlalarmerror.dll
  libxmlalarmops.dll

man-xml-cfgmgr-ops V[r33x/1] Handler for XML which contains CfgMgrs
  libxmlcfgmgrdebug.dll
  libxmlcfgmgrerror.dll
  libxmlcfgmgrrops.dll
  libxmltarcfg.dll
  xml_cfgmgr_debug.parser

man-xml-cli-ops V[r33x/1] Handler for XML which contains CLI reques
  libxmlclierror.dll
  libxmlcliops.dll
  xml_cli_debug.parser

man-xml-infra V[r33x/1] Generic infrastructure for XML support
  libxmlservice.dll
  libxmlservice_utils.dll
  libxmlserviceerror.dll
  xml_demo_agent
  xml_infra_cfg.parser
  xml_infra_debug.parser
  xml_infra_show.parser

man-xml-md-a-ops V[r33x/1] Handler for XML which contains MDA reques
  libxmlmdadebug.dll
  libxmlmdaerror.dll
  libxmlmdaops.dll
  libxmlmdatrans.dll
  xml_mda_debug.parser
  xml_mda_show.parser
  xml_mda_show_ltrace

man-xml-ttyagent V[r33x/1] XML Telnet/SSH agent
```

```

libxmlttycmn.dll
libxmlttyerror.dll
xml_tty_agent
xml_tty_agent.startup
xml_tty_agent_cfg.parser
xml_tty_client
xml_tty_client_exec.parser
xml_tty_cmnd_debug.parser

cfg-sh-mgbl V[r33x/1]  LR shared plane manageability config
sh_mgbl_ns_cfg__api.partitioninfo

package-compat V[r33x/1]  This is to collect package^Mcompatibilitys
package_compatibility

package-manage V[r33x/3]  This is to collect package^Mcompatibilitye
md5_manifest

snmp-assetmib V[r33x/1]  CISCO ASSET Management Information Base (M)
ciscoasset.mib
ciscoassetmib_cmds.parser
libciscoassetmib.dll

snmp-bulkfilemib V[r33x/1]  Bulk File Management Information Base (M)
bulkfile.mib
bulkfilemib_cmds.parser
libbulkfilemib.dll

snmp-assetmib-enhi V[r33x/1]  CISCO ENHANCED IMAGE MIB
enhimage.mib
enhimagemib_cmds.parser
libenhimagemib.dll

snmp-disman-mib V[r33x/1]  Event MIB Implementation
Event.mib
eventmib_cmds.parser
libeventmib.dll

snmp--disman-mib V[r33x/1]  EXPRESSION-MIB implementation
expression.mib
expressionmib_cmds.parser
libexpressionmib.dll

snmp-frucontrolmib V[r33x/1]  CISCO-FRU-CONTROL MIB Implementation A
frucontrol.mib
frucontrolmib_cmds.parser
libfrucontrolmib.dll
sh_frucontrolmib_ns_cfg__api.configinfo

snmp-ftpclientmib V[r33x/1]  FTP Client Management Information Base (M)
ftpclient.mib
ftpclientmib_cmds.parser
libftpclientmib.dll

snmp-pingmib V[r33x/1]  Ping Management Information Base (MIB)
libpingmib.dll
ping.mib
pingmib.startup
pingmib_cmds.parser
snmppingd

snmp-sensormib V[r33x/1]  Sensor Management Information Base (MIB)
ciscosensor.mib
ciscosensormib_cmds.parser

```

```
libciscosensormib.dll
sh_ciscosensormib_ns_cfg__api.configinfo
```

Table 90 describes the significant fields shown in the display.

Table 90 *show install pie-info Field Descriptions*

Field	Description
Contents of pie file	Storage device, directory, and name of the package.
Expiry date	Date when the package expires and can no longer be added to a router.
Uncompressed size	File size of the package after it is added to a local storage device.
hfr-mgbl-3.4.0	Name of the package.
Vendor	Name of the manufacturer.
Desc	Name of the package.
Build	Date and time the package was built.
Source	Source directory where the package was built.
Card(s)	Card types supported by the package.
Restart information	Restart impact on processes or nodes.
Components in package	Components included in the package.

Related Commands

Command	Description
show install	Displays active software packages.
show install active	Displays active software packages.
show install committed	Displays committed 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 package	Displays information about a package.
show install request	Displays the list of incomplete installation manager requests.
show install which	Displays the origin of a component, package, or file.

show install request

To display the list of incomplete installation requests, running and queued, use the **show install request** command in EXEC or administration EXEC mode.

show install request [detail]

Syntax Description	detail (Optional) Displays detailed information.

Defaults	No default behavior or values

Command Modes	EXEC Administration EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.
	Release 3.3.0	Command syntax was changed from show install requests to show install request .
	Release 3.4.0	Support was added for EXEC mode.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.
	Release 3.8.0	No modification.

Usage Guidelines	To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.

Cisco IOS XR software processes only one installation request per secure domain router (SDR) at a time. The **show install request** command displays any incomplete request that is currently running.

Use the **show install request** command in administration EXEC mode to display installation operations for all SDRs in the system. In EXEC mode, this command displays only the installation requests for that SDR.

**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. Performing a command in synchronous mode allows the installation process to finish before the prompt is returned.

**Tip**

These requests cannot be stopped by pressing **Ctrl-C**. To stop a request, use the **install attach** command to attach to the operation, then press **Ctrl-C** and select the “abort” option.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

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

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

Install operation 17 'install add /tftp://172.31.255.255/dir/19mcast'
started by user 'user_b' at 14:38:45 UTC Thu Mar 30 2006.
The operation is 1% complete
2,017KB downloaded
The operation can still be aborted.
```

The following is sample output from the **show install request** command when no installation operations are running:

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

There are no install requests in operation.
```

Related Commands

Command	Description
install activate	Adds a software package or an SMU to the active software set.
install add	Adds the contents of a PIE file to a storage device.
install deactivate	Removes a package from the active software set.
install remove	Deletes inactive packages from a storage device.
install rollback to	Rolls back the software set to a saved installation point or to the last committed installation point.
install verify packages	Verifies the consistency of a previously installed software set with the package file from which it originated.

show install rollback

To display the software set associated with a saved installation point, use the **show install rollback** command in EXEC or administration EXEC mode.

Administration EXEC Mode

show install rollback {*point-id* | *label*} [**detail** | **summary**] [**sdr** *sdr-name* | **location** *node-id*]

EXEC Mode

show install rollback {*point-id* | *label*} [**detail** | **summary**] [**location** *node-id*]

Syntax Description

<i>point-id</i>	Installation point ID number.
<i>label</i>	Label associated with an installation point ID.
summary	(Optional) Displays a summary of information in a system or SDR.
detail	(Optional) Displays a detailed summary of information for a system, SDR, or node, including the packages contained in a composite package.
sdr <i>sdr-name</i>	(Optional) Displays information for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR. This option is in administration EXEC mode only.
location <i>node-id</i>	(Optional) Displays information for a designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.0	This command was introduced on the Cisco CRS-1.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router. The command was made available in administration EXEC mode.
Release 3.3.0	The command was moved to administration EXEC mode only. Support was added for the keywords and arguments: sdr <i>sdr-name</i> , detail , and summary .
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show install rollback** command to display the software set associated with a saved installation point. To display the available rollback points, use the online help system. For example: **show install rollback ?**.



Tip

This command can be used with the **install rollback to** command to verify the software set associated with a saved installation point before rolling back to the saved installation point.

Enter the command in administration EXEC mode to display information that impacts all nodes in all SDRs.

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** keyword and *sdr-name* argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.

Displaying Information for a Specific Node

Use the **location** keyword and *node-id* argument to display information for a specific node. If you do not specify a location with the **location** keyword and *node-id* argument, this command displays information from all nodes.

Summary, Detailed, and Verbose Information

Use the **summary** keyword to display a summary of the packages that are used by the **install rollback to** command. Use the **detail** keyword to display additional information, including the individual packages included in the composite packages.



Tip

Use the **clear install rollback oldest** command to delete saved installation points from the installation buffer.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

In the following example, the **show install rollback ?** command displays the available rollback points:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# show install rollback ?
```

- ```
0 ID of the rollback point to show package information for
2 ID of the rollback point to show package information for
```

In the following example, the **show install rollback** command displays the packages for the rollback point “0”. This display summarizes the packages that are used by the **install rollback to** command:

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

Secure Domain Router: Owner

Node 0/1/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/1/CPU0 [LC] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/lc/mbihfr-lc.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/6/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/6/CPU0 [LC] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/lc/mbihfr-lc.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/RP0/CPU0 [RP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/mbihfr-rp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/RP1/CPU0 [RP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/mbihfr-rp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/SM0/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/SM1/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/SM2/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0

Node 0/SM3/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
```

In the following example, the **show install rollback detail** command displays additional information for the packages, including the individual packages included in the composite packages:

```
RP/0/RP0/CPU0:router(admin)# show install rollback 0 detail

Secure Domain Router: Owner
```

```
Node 0/1/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/1/CPU0 [LC] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/lc/mbihfr-lc.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-lc-3.4.0
 disk0:hfr-fwdg-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/6/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/6/CPU0 [LC] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/lc/mbihfr-lc.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-lc-3.4.0
 disk0:hfr-fwdg-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/RP0/CPU0 [RP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/mbihfr-rp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-rout-3.4.0
 disk0:hfr-lc-3.4.0
 disk0:hfr-fwdg-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/RP1/CPU0 [RP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/mbihfr-rp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-rout-3.4.0
 disk0:hfr-lc-3.4.0
 disk0:hfr-fwdg-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/SM0/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
```

■ **show install rollback**

```

disk0:hfr-os-mbi-3.4.0

Node 0/SM1/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/SM2/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

Node 0/SM3/SP [SP] [SDR: Owner]
 Boot Image: /disk0/hfr-os-mbi-3.4.0/sp/mbihfr-sp.vm
 Rollback Packages:
 disk0:comp-hfr-mini-3.4.0
 disk0:hfr-admin-3.4.0
 disk0:hfr-base-3.4.0
 disk0:hfr-os-mbi-3.4.0

```

Table 91 describes the significant fields shown in the display.

**Table 91** *show install rollback Field Descriptions*

| Field              | Description                                     |
|--------------------|-------------------------------------------------|
| Boot Image:        | Minimum boot image (MBI) used to boot the node. |
| Rollback Packages: | Packages that are rolled back.                  |

**Related Commands**

| Command                              | Description                                                                                            |
|--------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>clear install rollback oldest</b> | Deletes saved installation points from the installation buffer.                                        |
| <b>install rollback to</b>           | Rolls back the software set to a saved installation point or to the last committed installation point. |

# show install which

To display the origin of a named process, component, or package, use the **show install which** command in EXEC or administration EXEC mode.

**show install which** { **component** *name* [**verbose**] | **file** *filename* } [**sdr** *sdr-name* | **location** *node-id*]

## Syntax Description

|                                |                                                                                                                                                                          |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>component</b> <i>name</i>   | Displays the package information for the component specified in the <i>name</i> argument.                                                                                |
| <b>verbose</b>                 | (Optional) Displays summary, component, and file information for each component.                                                                                         |
| <b>file</b> <i>filename</i>    | Displays the package information for the file specified in the <i>filename</i> argument.                                                                                 |
| <b>location</b> <i>node-id</i> | (Optional) Displays information for the designated node. The <i>node-id</i> argument is expressed in <i>rack/slot/module</i> notation.                                   |
| <b>sdr</b> <i>sdr-name</i>     | (Optional. Administration EXEC mode only.) Displays information for a specific secure domain router (SDR). The <i>sdr-name</i> argument is the name assigned to the SDR. |

## Defaults

The default search is performed for the active software set.

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                                                                                                                                                                                                   |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                                                                                                                                                                                                                                |
| Release 3.0   | No modification.                                                                                                                                                                                                                                                               |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. The command was moved from EXEC mode to administration EXEC mode.                                                                                                                                        |
| Release 3.3.0 | This command was supported in both EXEC mode and administration EXEC mode.<br><br>Support was removed for the <b>files</b> keyword.<br><br>Support was added for the <b>verbose</b> keyword.<br><br>Support was added for the <b>sdr</b> <i>sdr-name</i> keyword and argument. |
| 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.                                                                                                                                                                                                                                                               |

**Usage Guidelines**

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **show install which** command to display information about a named process, component, or package. Information is shown for each node where the process, component, or package is located.

This command returns the same data in EXEC mode and administration EXEC mode.

Enter the command in administration EXEC mode to display information for all nodes in all SDRs.

**Displaying Information for a Specific SDR**

- To display information for a specific SDR from administration EXEC mode, use the **sdr** keyword and *sdr-name* argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.

**Displaying Information for a Specific Node**

Use the **location** keyword and *node-id* argument to display information for a specific node. If you do not specify a location with the **location** keyword and *node-id* argument, this command displays information from all nodes. If the process, component, or package is not located on that node, an error message is displayed.

**Verbose Information**

Use the **verbose** keyword to display additional information, including component and file information for each package.

**Task ID**

| Task ID  | Operations |
|----------|------------|
| pkg-mgmt | read       |

**Examples**

The following example shows CDP information for a single node. The **show install which** command is entered with the **file** and **location** keywords specified:

```
RP/0/0/CPU0:router(admin)# show install which file cdp location 0/6/cpu0
```

```
Node 0/6/CPU0 has file cdp for boot package /disk0/hfr-os-mbi-3.4.0.5I/lc/mbihfe
```

```
Package:
```

```
 hfr-base
```

```
 hfr-base V3.4.0.5I[SIT-image] Base Package
```

```
 Vendor : Cisco Systems
```

```
 Desc : Base Package
```

```
 Build : Built on Mon Aug 28 07:54:07 UTC 2006
```

```
 Source : By edde-bld1 in /vws/aga/production/3.4.0.5I.SIT-image/hfr/wor8
```

```
 Card(s): RP, DRP, DRPSC, OC3-POS-4, OC12-POS, GE-3, OC12-POS-4, OC48-POC
```

```
 Restart information:
```

```
 Default:
```

```
 parallel impacted processes restart
```

```
Component:
```

```
 cdp V[ci-34/6] Cisco Discovery Protocol (CDP)
```

```
File:
```



```

cdp
Card(s) : RP, DRP, LC, SC
Local view : /pkg/bin/cdp
Local install path : /disk0/hfr-base-3.4.0.5I/bin/cdp
Central install path : /disk0/hfr-base-3.4.0.5I/bin/cdp

```

The following example shows the message displayed if the specified process, component, or package is not active on a node:

```
RP/0/0/CPU0:router(admin)# show install which file cdp location 0/1/CPU0
```

```
File cdp not active on node 0/6/CPU0
```

To display all information for all instances of a specified process, component, or package, enter the **show install which** command without keywords or arguments, as shown in the following example:

```
RP/0/0/CPU0:router(admin)# show install which file cdp
```

```
File cdp not active on node 0/1/SP
```

```
Node 0/1/CPU0 has file cdp for boot package /disk0/hfr-os-mpi-3.4.0.5I/lc/mbihfe
Package:
```

```

hfr-base
hfr-base V3.4.0.5I[SIT-image] Base Package
Vendor : Cisco Systems
Desc : Base Package
Build : Built on Mon Aug 28 07:54:07 UTC 2006
Source : By edde-bld1 in /vws/aga/production/3.4.0.5I.SIT-image/hfr/wor8
Card(s): RP, DRP, DRPSC, OC3-POS-4, OC12-POS, GE-3, OC12-POS-4, OC48-POC
Restart information:
Default:
parallel impacted processes restart

```

```
Component:
```

```
cdp V[ci-34/6] Cisco Discovery Protocol (CDP)
```

```
File:
```

```

cdp
Card(s) : RP, DRP, LC, SC
Local view : /pkg/bin/cdp
Local install path : /disk0/hfr-base-3.4.0.5I/bin/cdp
Central install path : /disk0/hfr-base-3.4.0.5I/bin/cdp

```

```
File cdp not active on node 0/6/SP
```

```
Node 0/6/CPU0 has file cdp for boot package /disk0/hfr-os-mpi-3.4.0.5I/lc/mbihfe
Package:
```

```

hfr-base
hfr-base V3.4.0.5I[SIT-image] Base Package
Vendor : Cisco Systems
Desc : Base Package
Build : Built on Mon Aug 28 07:54:07 UTC 2006
Source : By edde-bld1 in /vws/aga/production/3.4.0.5I.SIT-image/hfr/wor8
Card(s): RP, DRP, DRPSC, OC3-POS-4, OC12-POS, GE-3, OC12-POS-4, OC48-POC
Restart information:
Default:
parallel impacted processes restart

```

```
Component:
```

```
cdp V[ci-34/6] Cisco Discovery Protocol (CDP)
```

```
File:
```

```

cdp
Card(s) : RP, DRP, LC, SC

```

## ■ show install which

```

Local view : /pkg/bin/cdp
Local install path : /disk0/hfr-base-3.4.0.5I/bin/cdp
Central install path : /disk0/hfr-base-3.4.0.5I/bin/cdp

```

Node 0/RP0/CPU0 has file cdp for boot package /disk0/hfr-os-mbi-3.4.0.5I/mbihfre  
Package:

```

hfr-base
 hfr-base V3.4.0.5I[SIT-image] Base Package
 Vendor : Cisco Systems
 Desc : Base Package
 Build : Built on Mon Aug 28 07:54:07 UTC 2006
 Source : By edde-bld1 in /vws/aga/production/3.4.0.5I.SIT-image/hfr/wor8
 Card(s) : RP, DRP, DRPSC, OC3-POS-4, OC12-POS, GE-3, OC12-POS-4, OC48-POC
 Restart information:
 Default:
 parallel impacted processes restart

```

Component:

```
cdp V[ci-34/6] Cisco Discovery Protocol (CDP)
```

File:

```

cdp
 Card(s) : RP, DRP, LC, SC
 Local view : /pkg/bin/cdp
 Local install path : /disk0/hfr-base-3.4.0.5I/bin/cdp
 Central install path : /disk0/hfr-base-3.4.0.5I/bin/cdp

```

Node 0/RP1/CPU0 has file cdp for boot package /disk0/hfr-os-mbi-3.4.0.5I/mbihfre  
Package:

```

hfr-base
 hfr-base V3.4.0.5I[SIT-image] Base Package
 Vendor : Cisco Systems
 Desc : Base Package
 Build : Built on Mon Aug 28 07:54:07 UTC 2006
 Source : By edde-bld1 in /vws/aga/production/3.4.0.5I.SIT-image/hfr/wor8
 Card(s) : RP, DRP, DRPSC, OC3-POS-4, OC12-POS, GE-3, OC12-POS-4, OC48-POC
 Restart information:
 Default:
 parallel impacted processes restart

```

Component:

```
cdp V[ci-34/6] Cisco Discovery Protocol (CDP)
```

File:

```

cdp
 Card(s) : RP, DRP, LC, SC
 Local view : /pkg/bin/cdp
 Local install path : /disk0/hfr-base-3.4.0.5I/bin/cdp
 Central install path : /disk0/hfr-base-3.4.0.5I/bin/cdp

```

File cdp not active on node 0/SM0/SP

File cdp not active on node 0/SM1/SP

File cdp not active on node 0/SM2/SP

File cdp not active on node 0/SM3/SP

Table 92 describes the significant fields shown in the display.

**Table 92** *show install which Field Descriptions*

| Field                | Description                                                                     |
|----------------------|---------------------------------------------------------------------------------|
| Package:             | Information about the package, as described in the following fields.            |
| hfr-base V3.4.0      | Name and release number of the package.                                         |
| Vendor               | Name of the manufacturer.                                                       |
| Desc                 | Name of the package.                                                            |
| Build                | Date and time the package was built.                                            |
| Source               | Source directory where the package was built.                                   |
| Card(s)              | Card types supported by the package.                                            |
| Restart information  | Restart impact on processes or nodes.                                           |
| Component:           | Component name and version number.                                              |
| File:                | Name of the of the process or DLL file that information is being specified for. |
| Card(s)              | Supported card types on which the file can be used.                             |
| Local view           | Generic directory path used to access the file on the nodes where it is used.   |
| Local install path   | Local directory path where the file is stored.                                  |
| Central install path | Directory path where the file is stored on RP and SC nodes.                     |

#### Related Commands

| Command                                | Description                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| <a href="#">show install</a>           | Displays active software packages.                              |
| <a href="#">show install active</a>    | Displays active software packages.                              |
| <a href="#">show install inactive</a>  | Displays inactive packages in the active software set.          |
| <a href="#">show install committed</a> | Displays committed software packages.                           |
| <a href="#">show install log</a>       | Displays the entries stored in the logging installation buffer. |
| <a href="#">show install package</a>   | Displays information about a package.                           |
| <a href="#">show install request</a>   | Displays the list of incomplete installation manager requests.  |
| <a href="#">show install which</a>     | Displays the origin of a component, package, or file.           |

■ show install which



# Terminal Services Commands on Cisco IOS XR Software

---

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 *Cisco IOS XR System Management Configuration Guide*.

# 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*

|                           |                |                                                                   |
|---------------------------|----------------|-------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>minutes</i> | Absolute timeout interval, in minutes. Range is from 10 to 10000. |
|---------------------------|----------------|-------------------------------------------------------------------|

|                 |                       |
|-----------------|-----------------------|
| <b>Defaults</b> | <i>minutes</i> : 1440 |
|-----------------|-----------------------|

|                      |                             |
|----------------------|-----------------------------|
| <b>Command Modes</b> | Line template configuration |
|----------------------|-----------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|------------------------|----------------|-----------------------------------------------------------------------|
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | <p>To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.</p> |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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.

| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|----------------|----------------|-------------------|
|                | 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                                                                             |
|---------------------------------|-----------------------------------------------------------------------------------------|
| <a href="#">exec-timeout</a>    | Sets the idle wait timeout interval for user input over a physical terminal connection. |
| <a href="#">session-timeout</a> | 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 **access-class** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

**access-class** *list-name* {**in** | **out**}

**no access-class** *list-name* {**in** | **out**}

## Syntax Description

|                  |                                |
|------------------|--------------------------------|
| <i>list-name</i> | IPv4 or IPv6 access list name. |
| <b>in</b>        | Filters incoming connections.  |
| <b>out</b>       | Filters outgoing connections.  |

## Defaults

No access class is set.

## Command Modes

Line template configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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/0/0/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/0/0/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                          |
|------------------|-------------------------|--------------------------------------|
|                  | <b>ipv4 access-list</b> | Defines an IPv4 access list by name. |
|                  | <b>ipv6 access-list</b> | 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*

|                           |                |                                                                         |
|---------------------------|----------------|-------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>command</i> | Command or command alias to be executed on user login to a vty session. |
|---------------------------|----------------|-------------------------------------------------------------------------|

|                 |                               |
|-----------------|-------------------------------|
| <b>Defaults</b> | No default behavior or values |
|-----------------|-------------------------------|

|                      |                                                           |
|----------------------|-----------------------------------------------------------|
| <b>Command Modes</b> | Line template configuration<br>Line default configuration |
|----------------------|-----------------------------------------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                              |
|------------------------|----------------|----------------------------------------------------------------------------------|
|                        | Release 3.4.0  | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. |
|                        | Release 3.5.0  | No modification.                                                                 |
|                        | Release 3.6.0  | No modification.                                                                 |
|                        | Release 3.7.0  | No modification.                                                                 |
|                        | Release 3.8.0  | No modification.                                                                 |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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.

| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|----------------|----------------|-------------------|
|                | 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 **autocommand** feature using the **no 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 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:  
Username: lab  
Password:  
RP/0/RP0/CPU0:router#

The following example shows how to a command alias with the **autocommand** feature 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 global configuration mode. To delete the EXEC banner, use the **no** form of this command.

**banner exec** *delimiter message delimiter*

**no banner exec**

|                           |                  |                                                                                                                                                                                                          |
|---------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>delimiter</i> | Delimiting character is “c”.                                                                                                                                                                             |
|                           | <i>message</i>   | Message text. Text may include tokens in the form $\$(token)$ in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in <a href="#">Table 93</a> . |

|                 |                              |
|-----------------|------------------------------|
| <b>Defaults</b> | No EXEC banner is displayed. |
|-----------------|------------------------------|

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

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | <p>To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.</p> |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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 [Table 93](#).

**Table 93** *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                                                                                                                                    |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">banner incoming</a>       | 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. |
| <a href="#">banner login</a>          | Defines and enables a customized banner that is displayed before the username and password login prompts.                                      |
| <a href="#">banner motd</a>           | Defines a customized MOTD banner.                                                                                                              |
| <a href="#">banner prompt-timeout</a> | 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 global configuration 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 $\$(token)$ in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in <a href="#">Table 94</a> . |

## Defaults

No incoming banner is displayed.

## Command Modes

Global configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

## ■ banner incoming

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. Tokens are described in [Table 94](#).

**Table 94** *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                                                                                               |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <a href="#">banner exec</a>           | Defines a customized banner that is displayed whenever the EXEC process is initiated.                     |
| <a href="#">banner login</a>          | Defines and enables a customized banner that is displayed before the username and password login prompts. |
| <a href="#">banner motd</a>           | Defines a customized MOTD banner.                                                                         |
| <a href="#">banner prompt-timeout</a> | 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 global configuration 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 $\$(token)$ in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in <a href="#">Table 95</a> . |

## Defaults

No login banner is displayed.

## Command Modes

Global configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 [Table 95](#).

**Table 95** *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                                                                                                                                    |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">banner exec</a>           | Defines a customized banner that is displayed whenever the EXEC process is initiated.                                                          |
| <a href="#">banner incoming</a>       | 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. |
| <a href="#">banner motd</a>           | Defines a customized MOTD banner.                                                                                                              |
| <a href="#">banner prompt-timeout</a> | 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 global configuration mode. To delete the MOTD banner, use the **no** form of this command.

**banner motd** *delimiter message delimiter*

**no banner motd**

|                           |                  |                                                                                                                                                           |
|---------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <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. |

**Defaults** No MOTD banner is displayed.

**Command Modes** Global configuration

| <b>Command History</b> | Release       | Modification                                                          |
|------------------------|---------------|-----------------------------------------------------------------------|
|                        | Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0   | No modification.                                                      |
|                        | Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0 | No modification.                                                      |
|                        | Release 3.4.0 | No modification.                                                      |
|                        | Release 3.5.0 | No modification.                                                      |
|                        | Release 3.6.0 | No modification.                                                      |
|                        | Release 3.7.0 | No modification.                                                      |
|                        | Release 3.8.0 | No modification.                                                      |

**Usage Guidelines** To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 motd-banner** 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 [Table 96](#).

**Table 96** *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                                                                                                                                    |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">banner exec</a>           | Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.                                              |
| <a href="#">banner incoming</a>       | 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. |
| <a href="#">banner login</a>          | Defines and enables a customized banner that is displayed before the username and password login prompts.                                      |
| <a href="#">banner prompt-timeout</a> | 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 global configuration 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 $\$(token)$ in the message text. Tokens are replaced with the corresponding configuration variable. |

## Defaults

No banner is displayed when there is a login authentication timeout.

## Command Modes

Global configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

**banner prompt-timeout**

| 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                                                                                                                                    |
|------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <a href="#">banner exec</a>     | Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.                                              |
|                  | <a href="#">banner incoming</a> | 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. |
|                  | <a href="#">banner login</a>    | Defines and enables a customized banner that is displayed before the username and password login prompts.                                      |
|                  | <a href="#">banner motd</a>     | Defines a customized MOTD banner.                                                                                                              |

# clear line

To clear an auxiliary or console line to an idle state, use the **clear line location** command in EXEC mode.

**clear line** { **aux** | **console** } **location** *node-id*

|                           |                |                                                                                                                                                                    |
|---------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>node-id</i> | Node ID, entered in the <i>rack/slot/module</i> notation. The location refers to a route processor (RP) where the auxiliary or console line to be cleared resides. |
|                           | <b>aux</b>     | Clears the auxiliary line.                                                                                                                                         |
|                           | <b>console</b> | Clears the console line.                                                                                                                                           |

|                 |                               |
|-----------------|-------------------------------|
| <b>Defaults</b> | No default behavior or values |
|-----------------|-------------------------------|

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

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                |                   |
|----------------|----------------|-------------------|
| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|                | tty-access     | execute           |

**clear line****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                                                           |
|----------------------------|-----------------------------------------------------------------------|
| <a href="#">show users</a> | 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 EXEC mode.

**clear line vty** *line-number*

|                           |                    |                                        |
|---------------------------|--------------------|----------------------------------------|
| <b>Syntax Description</b> | <i>line-number</i> | Line number in the range from 0 to 99. |
|---------------------------|--------------------|----------------------------------------|

|                 |                               |
|-----------------|-------------------------------|
| <b>Defaults</b> | No default behavior or values |
|-----------------|-------------------------------|

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

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|------------------------|----------------|-----------------------------------------------------------------------|
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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.

| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|----------------|----------------|-------------------|
|                | tty-access     | execute           |

|                 |                                                                   |
|-----------------|-------------------------------------------------------------------|
| <b>Examples</b> | 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                                                           |
|----------------------------|-----------------------------------------------------------------------|
| <a href="#">show users</a> | Displays information about the active lines on the networking device. |

# cli interactive syntax check

To enable interactive syntax checking, use the **cli interactive syntax check** command in the appropriate line configuration mode. To disable interactive syntax checking, use the **no** form of this command.

**cli interactive syntax check**

**no cli interactive syntax check**

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

**Defaults** Interactive syntax checking is disabled.

**Command Modes**

- Line console configuration
- Line default configuration
- Line template configuration

| Command History | Release       | Modification                                                                     |
|-----------------|---------------|----------------------------------------------------------------------------------|
|                 | Release 3.3.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. |
|                 | 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.                                                                 |

**Usage Guidelines**

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **cli interactive syntax check** command to check command syntax as you type. You are not allowed to enter incorrect syntax.

| Task ID | Task ID    | Operations  |
|---------|------------|-------------|
|         | tty-access | read, write |

---

**Examples**

The following example shows how to enable interactive syntax checking:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# cli interactive syntax check
```

---

**Related Commands**

| Command                                   | Description                                                  |
|-------------------------------------------|--------------------------------------------------------------|
| <a href="#">cli whitespace completion</a> | Enables completion of a command when you type the space key. |

# 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 arguments or keywords.

## Defaults

Whitespace completion is disabled.

## Command Modes

Line console configuration  
Line default configuration  
Line template configuration

## Command History

| Release       | Modification                                                                     |
|---------------|----------------------------------------------------------------------------------|
| Release 3.3.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. |
| 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.                                                                 |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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                          |
|----------------------------------------------|--------------------------------------|
| <a href="#">cli interactive syntax check</a> | 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

|          |                                        |
|----------|----------------------------------------|
| <b>5</b> | Sets the data bits per character to 5. |
| <b>6</b> | Sets the data bits per character to 6. |
| <b>7</b> | Sets the data bits per character to 7. |
| <b>8</b> | Sets the data bits per character to 8. |

## Defaults

Eight databits per character.

## Command Modes

Line console configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

**■ databits**

| 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                                                           |
|----------------------------|-----------------------------------------------------------------------|
| <a href="#">show users</a> | Displays information about the active lines on the networking device. |
| <a href="#">stopbits</a>   | Sets the number of stop bits.                                         |



# disconnect

To disconnect a network connection, use the **disconnect** command in EXEC mode.

**disconnect** [*connection-number* | *network-name*]

|                           |                          |                                                                                                           |
|---------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <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.                                      |

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

|                 |                                                                           |
|-----------------|---------------------------------------------------------------------------|
| <b>Defaults</b> | Disconnects the existing network connection if no arguments are provided. |
|-----------------|---------------------------------------------------------------------------|

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|                         | 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.                                                                                                                                                                                                                                                                                     |

|                |                |                   |
|----------------|----------------|-------------------|
| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|                | 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.                                                              |

## Defaults

No disconnect character is defined.

## Command Modes

Line template configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

The break character is represented by 0; null cannot be represented. Refer to the “ASCII Character Set and Hex Values” appendix for a list of ASCII characters.

## Task ID

| Task ID    | Operations  |
|------------|-------------|
| tty-access | read, write |

**disconnect-character****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                  |
|----------------------------------|------------------------------|
| <a href="#">escape-character</a> | 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

|                  |                                                                                |
|------------------|--------------------------------------------------------------------------------|
| <b>break</b>     | 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.                                                              |
| <b>default</b>   | Specifies the default escape character (^X).                                   |
| <b>none</b>      | Disables the escape function.                                                  |

## Defaults

The default escape character is ^X.

## Command Modes

Line template configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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. See the “ASCII Character Set and Hexidecimal Values” appendix for a list of ASCII characters.

**■ escape-character**

The default escape key sequence is Ctrl-Shift-6, X (^X). The **escape-character default** command 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                     |
|------------------|--------------------------------------|---------------------------------|
|                  | <a href="#">disconnect-character</a> | 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*

|                           |                |                                                            |
|---------------------------|----------------|------------------------------------------------------------|
| <b>Syntax Description</b> | <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. |

|                 |                     |
|-----------------|---------------------|
| <b>Defaults</b> | <i>minutes</i> : 10 |
|                 | <i>seconds</i> : 0  |

|                      |                             |
|----------------------|-----------------------------|
| <b>Command Modes</b> | Line console configuration  |
|                      | Line default configuration  |
|                      | Line template configuration |

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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 **exec-timeout 0 0** command.

---

**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                                                                            |
|----------------------------------|----------------------------------------------------------------------------------------|
| <a href="#">absolute-timeout</a> | Sets the absolute timeout for line disconnection.                                      |
| <a href="#">session-timeout</a>  | 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

|             |                                  |
|-------------|----------------------------------|
| <b>in</b>   | Specifies inbound flow control.  |
| <b>out</b>  | Specifies outbound flow control. |
| <b>none</b> | Specifies no flow control.       |

## Defaults

No default behavior or values

## Command Modes

Line console configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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                                                           |
|----------------------------|-----------------------------------------------------------------------|
| <a href="#">show users</a> | 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 lines. |
|--------------|--------------------------------------------------------------------------------------------------------------------------|

## Defaults

*lines*: 24 lines

## Command Modes

Line template configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 |

**length****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                                                               |
|---------------------------------|---------------------------------------------------------------------------|
| <a href="#">terminal length</a> | 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 global configuration mode.

**line** { **console** | **default** | **template** *template-name* }

## Syntax Description

|                                         |                                                                     |
|-----------------------------------------|---------------------------------------------------------------------|
| <b>console</b>                          | Specifies the line template for the console line.                   |
| <b>default</b>                          | Specifies the default line template.                                |
| <b>template</b><br><i>template-name</i> | Specifies a user-defined line template to be applied to a vty pool. |

## Defaults

No default behavior or values

## Command Modes

Global configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | The <b>aux</b> keyword was not supported.                             |
| 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.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 the 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.

**line**

| 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                     |
|------------------|--------------------------|---------------------------------|
|                  | <a href="#">vty-pool</a> | 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 | <b>even</b> | Specifies even parity. |
|                    | <b>none</b> | Specifies no parity.   |
|                    | <b>odd</b>  | Specifies odd parity.  |

|          |                   |
|----------|-------------------|
| Defaults | No parity is set. |
|----------|-------------------|

|               |                            |
|---------------|----------------------------|
| Command Modes | Line console configuration |
|---------------|----------------------------|

| Command History | Release       | Modification                                                          |
|-----------------|---------------|-----------------------------------------------------------------------|
|                 | Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
|                 | Release 3.0   | No modification.                                                      |
|                 | Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
|                 | Release 3.3.0 | No modification.                                                      |
|                 | Release 3.4.0 | The <b>mark</b> and <b>space</b> keywords were removed.               |
|                 | Release 3.5.0 | No modification.                                                      |
|                 | Release 3.6.0 | No modification.                                                      |
|                 | Release 3.7.0 | No modification.                                                      |
|                 | Release 3.8.0 | No modification.                                                      |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Usage Guidelines | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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.

## ■ parity

| 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                                                           |
|------------------|----------------------------|-----------------------------------------------------------------------|
|                  | <a href="#">show users</a> | 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 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. |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|

| Defaults | The most recent connection. |
|----------|-----------------------------|
|----------|-----------------------------|

| Command Modes | EXEC |
|---------------|------|
|---------------|------|

| Command History | Release       | Modification                                                          |
|-----------------|---------------|-----------------------------------------------------------------------|
|                 | Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
|                 | Release 3.0   | No modification.                                                      |
|                 | Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
|                 | Release 3.3.0 | No modification.                                                      |
|                 | Release 3.4.0 | No modification.                                                      |
|                 | Release 3.5.0 | No modification.                                                      |
|                 | Release 3.6.0 | No modification.                                                      |
|                 | Release 3.7.0 | No modification.                                                      |
|                 | Release 3.8.0 | No modification.                                                      |

| Usage Guidelines | <p>To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i>.</p> |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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 **resume** 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                                                                      |
|-------------------------------|----------------------------------------------------------------------------------|
| <a href="#">session-limit</a> | Sets the maximum number of outgoing terminal sessions from the current terminal. |
| <a href="#">show sessions</a> | Displays information about SSH and Telnet connections.                           |
| <a href="#">telnet</a>        | Logs in to a host that supports Telnet.                                          |

# send

To send messages to one or all terminal lines, use the **send** command in EXEC mode.

```
send { * | line-number | aux 0 | console 0 | vty number }
```

## Syntax Description

|                    |                                                                     |
|--------------------|---------------------------------------------------------------------|
| <b>*</b>           | 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.   |
| <b>aux 0</b>       | Sends a message to the auxiliary line.                              |
| <b>console 0</b>   | Sends a message to the console line.                                |
| <b>vtty number</b> | Sends a message to a virtual terminal line (vty). Range is 0 to 99. |

## Defaults

No default behavior or values

## Command Modes

EXEC

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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**

|                           |                    |                                                                     |
|---------------------------|--------------------|---------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>connections</i> | Maximum number of outgoing connections. Range is from 0 through 20. |
|---------------------------|--------------------|---------------------------------------------------------------------|

|                 |                       |
|-----------------|-----------------------|
| <b>Defaults</b> | <i>connections: 6</i> |
|-----------------|-----------------------|

|                      |                                                                                         |
|----------------------|-----------------------------------------------------------------------------------------|
| <b>Command Modes</b> | Line console configuration<br>Line default configuration<br>Line template configuration |
|----------------------|-----------------------------------------------------------------------------------------|

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                |                   |
|----------------|----------------|-------------------|
| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|                | 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 minutes. The default is 10 minutes.                                                                |
|                    | <b>output</b>  | (Optional) Specifies that when traffic is sent to an asynchronous line from the router (within the specified interval), the connection is retained. |

|          |                             |
|----------|-----------------------------|
| Defaults | <i>minutes</i> : 10 minutes |
|----------|-----------------------------|

|               |                                                                                         |
|---------------|-----------------------------------------------------------------------------------------|
| Command Modes | Line console configuration<br>Line default configuration<br>Line template configuration |
|---------------|-----------------------------------------------------------------------------------------|

| Command History | Release       | Modification                                                          |
|-----------------|---------------|-----------------------------------------------------------------------|
|                 | Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
|                 | Release 3.0   | No modification.                                                      |
|                 | Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
|                 | Release 3.3.0 | No modification.                                                      |
|                 | Release 3.4.0 | No modification.                                                      |
|                 | Release 3.5.0 | No modification.                                                      |
|                 | Release 3.6.0 | No modification.                                                      |
|                 | Release 3.7.0 | No modification.                                                      |
|                 | Release 3.8.0 | No modification.                                                      |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Usage Guidelines | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Use the **session-timeout** command to set the interval that the 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 **output** 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 EXEC mode.

**show line** [**aux location** *node-id* | **console location** *node-id* | **vtty number**]

|                           |                                   |                                                                                                                                                                                                |
|---------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <b>location</b><br><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/module</i> notation. |
|                           | <b>aux</b>                        | Displays the terminal line parameters for the auxiliary line.                                                                                                                                  |
|                           | <b>console</b>                    | Displays the terminal line parameters for the console line.                                                                                                                                    |
|                           | <b>vtty number</b>                | (Optional) Specifies a virtual terminal line (vtty) number. Range is from 0 through 99.                                                                                                        |

|                 |                               |
|-----------------|-------------------------------|
| <b>Defaults</b> | No default behavior or values |
|-----------------|-------------------------------|

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

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                |                   |
|----------------|----------------|-------------------|
| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|                | tty-access     | read              |

**Examples**

The following is sample output from the **show line** command. The asterisk (\*) indicates the current terminal session.

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

| Tty        | Speed | Modem | Uses | Noise | Overruns | Acc I/O |
|------------|-------|-------|------|-------|----------|---------|
| aux0_0_0   | 9600  | -     | -    | -     | 0/0      | -/-     |
| * con0_0_0 | 9600  | -     | -    | -     | 0/0      | -/-     |
| vty0       | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty1       | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty2       | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty3       | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty4       | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty100     | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty101     | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty102     | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty103     | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty104     | 0/0   | -     | -    | -     | 0/0      | -/-     |
| vty105     | 0/0   | -     | -    | -     | 0/0      | -/-     |

Table 97 describes the significant fields shown in the display.

**Table 97** *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 in the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Uses     | Not implemented in the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Noise    | Not implemented in the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 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 in the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                                                                               |

The following is 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 98 describes the significant fields shown in the display.

**Table 98** *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.                                                                                                                                                                                                                                                                                                                                                                 |
| Modem                  | Not been implemented on the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                            |
| Uses                   | Not been implemented on the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                            |
| Noise                  | Not been implemented on the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                            |
| 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 in the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                                 |
| Line                   | Unique identifier of the TTY. This field displays the type of TTY and the physical location of physical TTYs.                                                                                                                                                                                                                                                                                                                 |
| Location               | Not implemented in the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                                 |
| Type                   | Not implemented in the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                                                                 |
| Length                 | Length of the terminal or screen display, in rows.                                                                                                                                                                                                                                                                                                                                                                            |
| Width                  | Width of the terminal or screen display, in columns.                                                                                                                                                                                                                                                                                                                                                                          |
| Baud rate (TX/RX)      | Transmit rate/receive rate of the line, in bps.                                                                                                                                                                                                                                                                                                                                                                               |
| parity                 | Parity bits value used for physical terminal connections.                                                                                                                                                                                                                                                                                                                                                                     |
| stopbits               | Stop bits value used for physical terminal connections.                                                                                                                                                                                                                                                                                                                                                                       |
| databits               | Data bits value used for physical terminal connections.                                                                                                                                                                                                                                                                                                                                                                       |
| Template               | Line template being sourced by the particular connection.                                                                                                                                                                                                                                                                                                                                                                     |
| Config                 | Configuration applied to the tty. This field indicates the allowed incoming transports that can be used to access the router from this tty.                                                                                                                                                                                                                                                                                   |
| Allowed transports are | Incoming transport protocols that can be used by this tty to access the router.                                                                                                                                                                                                                                                                                                                                               |

# show sessions

To display information about suspended Secure Shell (SSH) and Telnet connections launched from the terminal session, use the **show sessions** command in EXEC mode.

## show sessions

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

**Defaults** No default behavior or values

**Command Modes** EXEC

| Command History | Release       | Modification                                                          |
|-----------------|---------------|-----------------------------------------------------------------------|
|                 | Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
|                 | Release 3.0   | No modification.                                                      |
|                 | Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
|                 | Release 3.3.0 | No modification.                                                      |
|                 | Release 3.4.0 | No modification.                                                      |
|                 | Release 3.5.0 | No modification.                                                      |
|                 | Release 3.6.0 | No modification.                                                      |
|                 | Release 3.7.0 | No modification.                                                      |
|                 | Release 3.8.0 | No modification.                                                      |

**Usage Guidelines** To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 is 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 | telnet  | 15   | 10.26.25.40 |

The asterisk (\*) indicates the current terminal session.

[Table 99](#) describes the significant fields shown in the display.

**Table 99** *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 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 the Cisco IOS XR software.                                                                                                                                                                                                                                                                                                                                       |

## Related Commands

| Command                    | Description                                |
|----------------------------|--------------------------------------------|
| <a href="#">disconnect</a> | Disconnects a network connection.          |
| <a href="#">resume</a>     | 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 EXEC mode.

## show terminal

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

**Defaults** No default behavior or values

**Command Modes** EXEC

| Command History | Release       | Modification                                                          |
|-----------------|---------------|-----------------------------------------------------------------------|
|                 | Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
|                 | Release 3.0   | No modification.                                                      |
|                 | Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
|                 | Release 3.3.0 | No modification.                                                      |
|                 | Release 3.4.0 | No modification.                                                      |
|                 | Release 3.5.0 | No modification.                                                      |
|                 | Release 3.6.0 | No modification.                                                      |
|                 | Release 3.7.0 | No modification.                                                      |
|                 | Release 3.8.0 | No modification.                                                      |

**Usage Guidelines** To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

| Task ID | Task ID    | Operations |
|---------|------------|------------|
|         | tty-access | read       |

**Examples** The following is sample output from the **show terminal** command:

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

```
Line con0_0_0, Location "Unknown", Type "Unknown"
Length: 0 lines, Width: 0 columns
Baud rate (TX/RX) is 9600/9600, 1 parity, 2 stopbits, 8 databits
```

```
Template: console
Config:
Allowed transports are none.
```

Table 100 describes the significant fields shown in the display.

**Table 100** *show terminal Field Descriptions*

| Field                  | Description                                                                                                                                 |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Line                   | Line that is currently being used.                                                                                                          |
| Location               | Not implemented in the Cisco IOS XR software.                                                                                               |
| Type                   | Not implemented in the Cisco IOS XR software.                                                                                               |
| 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 EXEC mode.

## show users

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

**Defaults** No default behavior or values

**Command Modes** EXEC

| Command History | Release       | Modification                                                          |
|-----------------|---------------|-----------------------------------------------------------------------|
|                 | Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
|                 | Release 3.0   | No modification.                                                      |
|                 | Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
|                 | Release 3.3.0 | No modification.                                                      |
|                 | Release 3.4.0 | No modification.                                                      |
|                 | Release 3.5.0 | No modification.                                                      |
|                 | Release 3.6.0 | No modification.                                                      |
|                 | Release 3.7.0 | No modification.                                                      |
|                 | Release 3.8.0 | No modification.                                                      |

**Usage Guidelines** To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 *Authentication, Authorization, and Accounting Commands on Cisco IOS XR Software*.

| Task ID | Task ID    | Operations |
|---------|------------|------------|
|         | tty-access | read       |



## Examples

The following is 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 101 describes the significant fields shown in the display.

**Table 101** *show users 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                                                                         |
|---------------------------|-------------------------------------------------------------------------------------|
| <a href="#">show line</a> | Displays the parameters of a terminal line.                                         |
| <a href="#">show user</a> | 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. |

Defaults

Two stop bits.

Command Modes

Line console configuration

Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

Task ID

| Task ID    | Operations  |
|------------|-------------|
| tty-access | read, write |

---

**Examples**

The following 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                   |
|--------------------------|-------------------------------|
| <a href="#">databits</a> | Sets the number of data bits. |

# terminal exec

To specify attributes for the current terminal session, use the **terminal exec** command in EXEC mode.

**terminal exec prompt {no-timestamp | timestamp}**

|                           |                     |                                                       |
|---------------------------|---------------------|-------------------------------------------------------|
| <b>Syntax Description</b> | <b>prompt</b>       | Specifies the prompt attributes.                      |
|                           | <b>no-timestamp</b> | Disables the time-stamp printing before each command. |
|                           | <b>timestamp</b>    | Enables the time-stamp printing before each command.  |

**Defaults** No default behavior or values

**Command Modes** EXEC

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

**Usage Guidelines** To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **terminal exec prompt timestamp** command to show the time-stamp display after each command is entered. Use the **terminal exec prompt no-timestamp** command 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

The following example shows how to enable the timestamp 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.

```
RP/0/RP0/CPU0:router# terminal exec prompt timestamp
```

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

```
Thu Jun 1 14:31:31.200 UTC
```

```
Cisco IOS XR Software, Version 3.3.0[00]
Copyright (c) 2006 by cisco Systems, Inc.
```

```
ROM: System Bootstrap, Version 1.38(20060207:032757) [CRS-1 ROMMON],
```

```
router uptime is 1 hour, 18 minutes
System image file is "disk0:hfr-os-mbi-3.3.0/mbihfr-rp.vm"
```

```
cisco CRS-8/S (7457) processor with 4194304K bytes of memory.
7457 processor at 1197Mhz, Revision 1.2
```

```
16 Packet over SONET/SDH network interface(s)
16 SONET/SDH Port controller(s)
2 Ethernet/IEEE 802.3 interface(s)
16 GigabitEthernet/IEEE 802.3 interface(s)
2043k bytes of non-volatile configuration memory.
38079M bytes of hard disk.
1000592k bytes of ATA PCMCIA card at disk 0 (Sector size 512 bytes).
1000640k bytes of ATA PCMCIA card at disk 1 (Sector size 512 bytes).
```

```
Package active on node 0/1/SP:
hfr-diags, V 3.3.0[00], Cisco Systems, at disk0:hfr-diags-3.3.0
```

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                                                                |
|------------------|-------------------------------|----------------------------------------------------------------------------|
|                  | <a href="#">show terminal</a> | Display the terminal configuration settings for the current terminal line. |

# 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 EXEC mode.

**terminal length** *lines*

## Syntax Description

|              |                                                                        |
|--------------|------------------------------------------------------------------------|
| <i>lines</i> | Number of lines that display on a screen. Range is from 0 through 512. |
|--------------|------------------------------------------------------------------------|

## Defaults

No default behavior or values

## Command Modes

EXEC

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following 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                              |
|------------------------|------------------------------------------|
| <a href="#">length</a> | Sets the length of the display terminal. |

# terminal monitor

To display **debug** command output and system error messages for the current terminal and session, use the **terminal monitor** command in EXEC mode.

**terminal monitor [disable]**

## Syntax Description

|                |                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------|
| <b>disable</b> | (Optional) Disables the terminal monitor. Debug command output and system error messages are not displayed. |
|----------------|-------------------------------------------------------------------------------------------------------------|

## Defaults

The terminal monitor is disabled by default.

## Command Modes

EXEC

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

## Task ID

| Task ID | Operations |
|---------|------------|
| logging | execute    |

## Examples

In the following example, the system is configured to display **debug** command output and error messages during the current terminal session:

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



**Related Commands**

| Command                | Description                              |
|------------------------|------------------------------------------|
| <a href="#">length</a> | 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 EXEC mode.

**terminal width** *characters*

|                           |                   |                                                                      |
|---------------------------|-------------------|----------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>characters</i> | Number of characters to display on a screen. Range is from 0 to 512. |
|---------------------------|-------------------|----------------------------------------------------------------------|

|                 |                               |
|-----------------|-------------------------------|
| <b>Defaults</b> | No default behavior or values |
|-----------------|-------------------------------|

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

|                        |                |                                                                       |
|------------------------|----------------|-----------------------------------------------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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.

|                |                |                   |
|----------------|----------------|-------------------|
| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|                | 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                             |
|---------------------------------|-----------------------------------------|
| <a href="#">width (display)</a> | 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 arguments or keywords.

## Defaults

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 3.3.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                     |
| 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 | The command was changed from <b>timestamp</b> to <b>timestamp disable</b> . The default was changed. |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 **timestamp disable** 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**

The following 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}

|                           |               |                                                                                           |
|---------------------------|---------------|-------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <b>all</b>    | Specifies the Secure Shell (SSH) and Telnet protocols                                     |
|                           | <b>none</b>   | Specifies that the router rejects incoming SSH and Telnet transport protocol connections. |
|                           | <b>ssh</b>    | Specifies the SSH transport protocol.                                                     |
|                           | <b>telnet</b> | Specifies the Telnet transport protocol.                                                  |

**Defaults** All protocols are allowed on the line.

**Command Modes**

- Line console configuration
- Line default configuration
- Line template configuration

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|------------------------|----------------|-----------------------------------------------------------------------|
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

**Usage Guidelines**

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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** The following 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                                                                                                                         |
|------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                  | <a href="#">transport output</a>    | Determines the protocols that can be used for outgoing connections from a line.                                                     |
|                  | <a href="#">transport preferred</a> | Specifies the transport protocol that the 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

|               |                                                                                           |
|---------------|-------------------------------------------------------------------------------------------|
| <b>all</b>    | Specifies the Secure Shell (SSH) and Telnet transport protocols.                          |
| <b>none</b>   | Specifies that the router rejects outgoing SSH and Telnet transport protocol connections. |
| <b>ssh</b>    | Specifies the SSH transport protocol.                                                     |
| <b>telnet</b> | Specifies the Telnet transport protocol.                                                  |

## Defaults

All protocols are allowed on the line.

## Command Modes

Line console configuration  
Line default configuration  
Line template configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

The following 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                                                                                                                         |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">transport input</a>     | Defines which protocols to use to connect to a specific line of the router.                                                         |
| <a href="#">transport preferred</a> | Specifies the transport protocol that the 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

|               |                                                      |
|---------------|------------------------------------------------------|
| <b>none</b>   | Disables the feature.                                |
| <b>ssh</b>    | Specifies the Secure Shell (SSH) transport protocol. |
| <b>telnet</b> | Specifies the Telnet transport protocol.             |

## Defaults

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 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |
| Release 3.4.0 | No modification.                                                      |
| Release 3.5.0 | No modification.                                                      |
| Release 3.6.0 | No modification.                                                      |
| Release 3.7.0 | No modification.                                                      |
| Release 3.8.0 | No modification.                                                      |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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.

The 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 **transport preferred none** command, 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                                                                     |
|------------------|----------------------------------|---------------------------------------------------------------------------------|
|                  | <a href="#">transport input</a>  | Defines which protocols to use to connect to a specific line of the router.     |
|                  | <a href="#">transport output</a> | 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 global configuration 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

|                      |                                                                                                                                                                                                                                                                                                                             |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>default</b>       | Specifies the default vty pool.                                                                                                                                                                                                                                                                                             |
| <b>eem</b>           | 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. <ul style="list-style-type: none"> <li>For the default vty pool, you must specify <b>0</b> for the first vty line.</li> <li>For a user-defined vty pool, the range is 5 to 99.</li> <li>For the embedded event manager vty pool, you must specify <b>100</b> for the first vty line.</li> </ul> |
| <i>last-vty</i>      | Last vty line in the pool. <ul style="list-style-type: none"> <li>The default vty pool must contain at least five vtys. Range is 4 to 99.</li> <li>For a user-defined vty pool, the range is 5 to 99.</li> <li>The embedded event manager vty pool must contain at least six vtys. Range is 105 to 199.</li> </ul>          |
| <b>line-template</b> | (Optional) Specifies the terminal template to be used in the configuration of virtual terminals in the vty pool.                                                                                                                                                                                                            |
| <b>default</b>       | 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.                                                                                                                                                                                                                                                            |

## Defaults

**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

Global configuration

## Command History

| Release       | Modification                                                          |
|---------------|-----------------------------------------------------------------------|
| Release 2.0   | This command was introduced on the Cisco CRS-1.                       |
| Release 3.0   | No modification.                                                      |
| Release 3.2   | This command was first supported on the Cisco XR 12000 Series Router. |
| Release 3.3.0 | No modification.                                                      |

| Release       | Modification                                      |
|---------------|---------------------------------------------------|
| Release 3.4.0 | No modification.                                  |
| Release 3.5.0 | No modification.                                  |
| Release 3.6.0 | No modification.                                  |
| Release 3.7.0 | No modification.                                  |
| Release 3.8.0 | The keyword <b>fm</b> was changed to <b>eem</b> . |

### Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 *Cisco IOS XR IP Addresses and Services Configuration Guide* and *Cisco IOS XR IP Addresses and Services Command Reference* 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                                                              |
|----------------------|--------------------------------------------------------------------------|
| <a href="#">line</a> | 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*

|                           |                   |                                                                      |
|---------------------------|-------------------|----------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>characters</i> | Number of characters to display on a screen. Range is from 0 to 512. |
|---------------------------|-------------------|----------------------------------------------------------------------|

|                 |                       |
|-----------------|-----------------------|
| <b>Defaults</b> | <i>characters: 80</i> |
|-----------------|-----------------------|

|                      |                                                                                         |
|----------------------|-----------------------------------------------------------------------------------------|
| <b>Command Modes</b> | Line console configuration<br>Line default configuration<br>Line template configuration |
|----------------------|-----------------------------------------------------------------------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>                                                   |
|------------------------|----------------|-----------------------------------------------------------------------|
|                        | Release 2.0    | This command was introduced on the Cisco CRS-1.                       |
|                        | Release 3.0    | No modification.                                                      |
|                        | Release 3.2    | This command was first supported on the Cisco XR 12000 Series Router. |
|                        | Release 3.3.0  | No modification.                                                      |
|                        | Release 3.4.0  | No modification.                                                      |
|                        | Release 3.5.0  | No modification.                                                      |
|                        | Release 3.6.0  | No modification.                                                      |
|                        | Release 3.7.0  | No modification.                                                      |
|                        | Release 3.8.0  | No modification.                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Security Configuration Guide</i> . |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Use the **width** command to modify the default width setting for the specified line template.

| <b>Task ID</b> | <b>Task ID</b> | <b>Operations</b> |
|----------------|----------------|-------------------|
|                | tty-access     | read, write       |

## Examples

The following 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                                                              |
|--------------------------------|--------------------------------------------------------------------------|
| <a href="#">terminal width</a> | Sets the width of the display terminal for the current terminal session. |

■ width (display)





## Utility Commands on Cisco IOS XR Software

---

This module describes the utility commands for the 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 keyword **universal** can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the keyword **usage**.

---

# utility bc

To implement an arbitrary precision calculator, use the **utility bc** command in EXEC mode or administration 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 *input-file* syntax is:

*device:[/directory-path]/filename*

Include the alias for the *device* argument, followed by a colon, and, optionally, the name of a directory. The possible devices are:

- **bootflash:**—Uses a file from the bootflash: file system (Cisco XR 12000 Series Routers only).
- **compactflash:**—Uses a file from the compactflash: file system (Cisco XR 12000 Series Routers only)
- **compactflasha:**—Uses a file from compactflasha: file system partition (Cisco XR 12000 Series Routers only)
- **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.
- **flash:**—Uses a file from the flash: file system. The **flash:** keyword is alias for bootflash: (Cisco XR 12000 Series Routers only).
- **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).
- **nvr:**—Uses a file from the nvram: 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 system to display the available devices and network protocols.

**Defaults**

If an input file is not specified, the standard input (keyboard) is used.

**Command Modes**

EXEC  
Administration EXEC

**Command History**

| Release       | Modification                                                                                         |
|---------------|------------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                     |
| Release 3.5.0 | No modification.                                                                                     |
| Release 3.6.0 | The following file systems were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                     |
| Release 3.8.0 | No modification.                                                                                     |

**Usage Guidelines**

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **utility bc** command to use the an 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 102 describes the network protocols supported by the Cisco IOS XR software.

**Table 102 Network Protocols Supported by the Cisco IOS XR software**

| Prefix       | Name                           | Description                                                                                                                                                                                                             |
|--------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>tftp:</b> | Trivial File Transfer Protocol | TFTP is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).             |
| <b>ftp:</b>  | File Transfer Protocol         | FTP is an application protocol, part of the TCP/IP protocol stack, and is used for transferring files between network nodes. FTP requires a username and password.                                                      |
| <b>rcp:</b>  | remote copy protocol           | Rcp 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 EXEC mode or administration EXEC mode.

**utility cut** { { **list** *character-list* | **fields** *field-list* [**nodelim**] [**delimiter** *delimiter-character*] | *WORD* } [**file** *input-file*] | **usage** }

## Syntax Description

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>list</b> <i>character-list</i>           | <p>(-c) Cuts out the characters that are located on each line as specified with the <i>character-list</i> argument.</p> <p>The <i>character-list</i> argument specifies the character positions or range of the characters to be cut.</p> <ul style="list-style-type: none"> <li>Use a comma (,) to indicate more than one character. For example, <b>utility list 1,2,5</b> outputs the first, second, and fifth characters.</li> <li>Use a dash (-) to indicate a range. For example, <b>utility list 1-64</b> outputs the first 64 characters of each line, <b>utility list 5-</b> outputs the fifth character to the end of the line.</li> </ul> <p><b>Note</b> Lines are separated by a delimiter. The default delimiter is tab.</p> |
| <b>fields</b> <i>field-list</i>             | <p>(-f) Cuts out the fields (lines) as indicated with the <i>field-list</i> argument.</p> <p>The <i>list</i> argument specifies the field numbers or ranges. For example, <b>utility field 2,9</b> outputs the second and ninth fields, <b>utility field 1-3</b> outputs the first three fields, <b>utility list -6</b> outputs the first six fields.</p> <p><b>Note</b> The fields indicated by the <i>list</i> argument are assumed to be separated in the file by a delimiter character. The default delimiter is tab. Use the <b>delimiter</b> <i>delimiter</i> option to specify a delimiter character. Lines without field delimiters are processed unless the <b>nodelim</b> keyword is specified.</p>                             |
| <b>nodelim</b>                              | (Optional) (-s) Ignores lines with no delimiter. Use this optional keyword when the <b>fields</b> <i>list</i> keyword and argument is specified,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>delimiter</b> <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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>file</b> <i>input-file</i>               | <p>(Optional) Storage device and directory path of the text file used instead of the standard input (keyboard input).</p> <p>The <i>input-file</i> syntax is:<br/> <i>device:[/directory-path]/filename</i></p> <p>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols.</p>                                                                                                                                                                                                                                                                                                        |
| <b>usage</b>                                | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**Defaults**

If no file is specified, the keyboard input (standard input) is used.  
The delimiter is *tab*.

**Command Modes**

EXEC  
Administration EXEC

**Command History**

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

**Usage Guidelines**

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 keyword **fields** can also be entered using the UNIX-equivalent (**-f**). To display the UNIX-equivalent syntax online, enter the keyword **usage**.

**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 command **show version**, 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                                                                                   |
|------------------------------|-----------------------------------------------------------------------------------------------|
| <a href="#">utility head</a> | Copies bytes or lines at the beginning of the output displayed from standard input or a file. |
| <a href="#">utility sort</a> | Sorts, merges, or sequence-checks the output displayed from standard input or a file.         |
| <a href="#">utility tail</a> | 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 EXEC mode or administration EXEC mode.

**utility date** { **format** *word* | **universal** | **usage** | *WORD* }

## Syntax Description

|                           |                                                                                                                                                           |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>format</b> <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. |
| <b>universal</b>          | (Optional) (-u) Displays the date in Coordinated Universal Time (UTC) instead of local time. UTC is the standard term for Greenwich Mean Time (GMT).      |
| <b>usage</b>              | (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.                                                                       |

## Defaults

The date is displayed in local time.

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                     |
|---------------|----------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. |
| Release 3.5.0 | No modification.                                                                 |
| Release 3.6.0 | No modification.                                                                 |
| Release 3.7.0 | No modification.                                                                 |
| Release 3.8.0 | No modification.                                                                 |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 arguments:

- **%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 keyword **universal** can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the keyword **usage**.

**Task ID**

| Task ID   | Operations |
|-----------|------------|
| universal | execute    |

**Examples**

The following 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
```

The following 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                                    |
|----------------------------------|------------------------------------------------|
| <a href="#">utility date set</a> | Sets the internal date and time of the router. |

# utility date set

To set the router time, use the **utility date set** command in administration EXEC mode.

**utility date set** *hh:mm:ss*

## Syntax Description

|           |                                                                   |
|-----------|-------------------------------------------------------------------|
| <i>hh</i> | Specifies the hour in 2-digit numerical format. Range is 00-23.   |
| <i>mm</i> | Specifies the minutes in 2-digit numerical format. Range is 0-59. |
| <i>ss</i> | Specifies the seconds in 2-digit numerical format. Range is 0-59. |

## Defaults

No default behavior or values

## Command Modes

Administration EXEC

## Command History

| Release       | Modification                                                                     |
|---------------|----------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. |
| Release 3.5.0 | No modification.                                                                 |
| Release 3.6.0 | No modification.                                                                 |
| Release 3.7.0 | No modification.                                                                 |
| Release 3.8.0 | No modification.                                                                 |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 **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                                        |
|------------------------------|----------------------------------------------------|
| <a href="#">utility date</a> | 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 EXEC mode or administration EXEC mode.

**utility df** *[[WORD] [kbytes][mountinfo] [vsfStats] [file input-file] | usage]*

## Syntax Description

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>WORD</b>            | (Optional) UNIX command-line option string. The maximum number of characters is 80.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>kbytes</b>          | (Optional) <b>(-k)</b> Displays the sizes in 1-K blocks (1024-byte units) instead of the default of 512 byte blocks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>mountinfo</b>       | (Optional) <b>(-n)</b> Displays the file-system mountpoints and types only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>vsfStats</b>        | (Optional) <b>(-g)</b> Displays all statvfs() information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>file input-file</b> | (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.<br><br>If no files are specified, then only the standard input (keyboard) is used.<br><br>The <i>input-file</i> syntax is:<br><i>device:[/directory-path]/filename</i><br><br>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols. |
| <b>usage</b>           | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Defaults

Information is displayed for all file systems.  
The results are displayed in 512-byte blocks.

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

**Usage Guidelines**

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

Use the **utility df** (disk free) 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 keyword **kbytes** can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the keyword **usage**.

**Task ID****Task ID                      Operations**

| Task ID   | Operations |
|-----------|------------|
| universal | execute    |

**Examples**

In the following example, the **utility df** (disk free) 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 104](#) 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 104](#) 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 []

```

Table 103 describes the significant fields shown in the display.

**Table 103** *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 is used to specify a directory:

```
RP/0/RP0/CPU0:router(admin)# utility df file disk0:/usr
```

```

/dev/disk0t6 2001184 533568 1467616 27% /disk0:/

```

Table 104 describes the significant fields shown in the display.

**Table 104**      *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                                                                 |
|----------------------------|-----------------------------------------------------------------------------|
| <a href="#">utility du</a> | 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 EXEC mode or administration EXEC mode.

**utility du** *[[all | specified] [kbytes | bytes | local] [WORD] [file source] | usage]*

| Syntax Description |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>all</b>         | (Optional) <b>(-a)</b> Displays the disk space used for each file in the directory. By default, information is displayed only for the directory. Use the <b>all</b> keyword to display the total disk space used by all files in the directory, including the directory itself.                                                                                                                                                                                                                                                                                                                            |  |
| <b>specified</b>   | (Optional) <b>(-s)</b> Displays the total disk space used for each specified file, rather than the totals for any subdirectories.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| <b>kbytes</b>      | (Optional) <b>(-k)</b> Displays the disk space used in 1-K blocks (1024-byte units) instead of the default of 512-byte blocks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| <b>bytes</b>       | (Optional) <b>(-p)</b> Displays the disk space used in bytes (the default is 512-byte blocks). Also generates error messages for exiting files that cannot be displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| <b>local</b>       | (Optional) <b>(-x)</b> Displays information for the local device only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| <b>WORD</b>        | (Optional) UNIX command-line option string. The maximum number of characters is 80.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| <b>file source</b> | (Optional) Displays the disk space used for a device, directory, or file.<br><br>The <i>source</i> syntax is:<br><i>device:/directory-path[/filename]</i><br><br>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols.<br><br>Enter the <b>utility du</b> 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). |  |
| <b>usage</b>       | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |

**Defaults** Information for the current directory is displayed.

**Command Modes** EXEC  
Administration EXEC

| Command History | Release       | Modification                                                                                    |
|-----------------|---------------|-------------------------------------------------------------------------------------------------|
|                 | Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
|                 | Release 3.5.0 | No modification.                                                                                |
|                 | Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |

| Release       | Modification     |
|---------------|------------------|
| Release 3.7.0 | No modification. |
| Release 3.8.0 | No modification. |

### Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 keyword **kbytes** can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the keyword **usage**.

### 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:

```
RP/0/RP0/CPU0:router# utility du file disk0:/hfr-mpls-3.4.0
```

```

160 /disk0:/hfr-mpls-3.4.0/schema
104 /disk0:/hfr-mpls-3.4.0/lib/cerrno
625 /disk0:/hfr-mpls-3.4.0/lib/mib
2545 /disk0:/hfr-mpls-3.4.0/lib
9658 /disk0:/hfr-mpls-3.4.0/bin
39 /disk0:/hfr-mpls-3.4.0/startup
840 /disk0:/hfr-mpls-3.4.0/parser
37 /disk0:/hfr-mpls-3.4.0/configs
35 /disk0:/hfr-mpls-3.4.0/mib
35 /disk0:/hfr-mpls-3.4.0/rules
34 /disk0:/hfr-mpls-3.4.0/partitions
135 /disk0:/hfr-mpls-3.4.0/etc/compat
167 /disk0:/hfr-mpls-3.4.0/etc
66 /disk0:/hfr-mpls-3.4.0/instdb_v
181 /disk0:/hfr-mpls-3.4.0/lc/bin
33 /disk0:/hfr-mpls-3.4.0/lc/startup
246 /disk0:/hfr-mpls-3.4.0/lc
112 /disk0:/hfr-mpls-3.4.0/instdb
14006 /disk0:/hfr-mpls-3.4.0
```

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:/hfr-mpls-3.4.0/configs

 37 /disk0:/hfr-mpls-3.4.0/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:/hfr-mpls-3.4.0
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                                                          |
|----------------------------|----------------------------------------------------------------------|
| <a href="#">utility df</a> | 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 EXEC mode or administration EXEC mode.

**utility egrep** {[**expr** *expression* | **script** *expression-file*] [**WORD**] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*] | **usage**}

## Syntax Description

|                                      |                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>expr</b> <i>expression</i>        | ( <b>-e</b> ) 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.                                                                                                               |
| <b>script</b> <i>expression-file</i> | ( <b>-f</b> ) 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.<br><br>The <i>expression-file</i> syntax is:<br><br><i>[device:]filename</i> |
| <b>WORD</b>                          | (Optional) UNIX command-line option string. The maximum number of characters is 20.                                                                                                                                                                                                                                                                 |
| <b>count</b>                         | (Optional) ( <b>-c</b> ) Displays a count of selected lines.                                                                                                                                                                                                                                                                                        |
| <b>linenum</b>                       | (Optional) ( <b>-n</b> ) Before each output line, displays the line's line number.                                                                                                                                                                                                                                                                  |
| <b>matchfile</b>                     | (Optional) ( <b>-l</b> ) ("el") Displays only the names of files containing the selected lines.                                                                                                                                                                                                                                                     |
| <b>matchline</b>                     | (Optional) ( <b>-x</b> ) Includes only input lines selected against an entire fixed string or regular expression.                                                                                                                                                                                                                                   |
| <b>nocase</b>                        | (Optional) ( <b>-i</b> ) Ignores uppercase and lowercase distinctions during comparisons.                                                                                                                                                                                                                                                           |
| <b>nofile</b>                        | (Optional) ( <b>-h</b> ) Displays results without a filename prefix attached to the matched lines. This option applies only when more than one file is searched.                                                                                                                                                                                    |
| <b>reverse</b>                       | (Optional) ( <b>-v</b> ) Selects only those lines that don't match the specified patterns.                                                                                                                                                                                                                                                          |
| <b>file</b> <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 <i>search-file</i> syntax is:<br><br><i>[device:]filename</i>                                                                                                                                                  |
| <b>usage</b>                         | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                     |

## Defaults

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

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

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 keyword **count** can also be entered using the UNIX-equivalent **(-c)**. To display the UNIX-equivalent syntax online, enter the keyword **usage**.

## 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                                   |
|-------------------------------|-----------------------------------------------|
| <a href="#">utility fgrep</a> | 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 EXEC mode or administration EXEC mode.

**utility fgrep** {[**expr** *expression* | **script** *expression-file*] [**WORD**] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]}| **usage**}

|                           |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <b>exp</b> <i>expression</i>         | ( <b>-e</b> ) 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.                                                                                                                                                                                                                                                                                                                                              |
|                           | <b>script</b> <i>expression-file</i> | ( <b>-f</b> ) 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.<br><br>The <i>expression-file</i> syntax is:<br><i>device:[/directory-path]/filename</i><br><br>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols. |
|                           | <b>WORD</b>                          | (Optional) UNIX command-line option string. The maximum number of characters is 20.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                           | <b>count</b>                         | (Optional) ( <b>-c</b> ) Displays a count of selected lines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                           | <b>linenum</b>                       | (Optional) ( <b>-n</b> ) Before each output line, displays the line's line number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                           | <b>matchfile</b>                     | (Optional) ( <b>-l</b> ) ("el") Displays only the names of files containing the selected lines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                           | <b>matchline</b>                     | (Optional) ( <b>-x</b> ) Includes only input lines selected against an entire fixed string or regular expression.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                           | <b>nocase</b>                        | (Optional) ( <b>-i</b> ) Ignores uppercase and lowercase distinctions during comparisons.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                           | <b>nofile</b>                        | (Optional) ( <b>-h</b> ) Displays results without a filename prefix attached to the matched lines. This option applies only when more than one file is searched.                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                           | <b>reverse</b>                       | (Optional) ( <b>-v</b> ) Selects only those lines that don't match the specified patterns.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                           | <b>file</b> <i>search-file</i>       | The file used for the search. Replace the <i>search-file</i> argument with the device and directory path of the file. The <i>search-file</i> syntax is:<br><i>device:[/directory-path]/filename</i>                                                                                                                                                                                                                                                                                                                                                                                |
|                           | <b>usage</b>                         | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Defaults

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

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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

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 keyword **count** can also be entered using the UNIX-equivalent (**-c**). To display the UNIX-equivalent syntax online, enter the keyword **usage**.

## 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                                     |
|-------------------------------|-------------------------------------------------|
| <a href="#">utility egrep</a> | Searches a file using full regular expressions. |



# utility find

To locate files within one or more directories, use the **utility find** command in EXEC mode or administration EXEC mode.

**utility find** { **path** *directory-path* { **name** *filename-pattern* | **user** *user-id* | *LINE* } | **usage** }

## Syntax Description

|                                     |                                                                                                                                                                                                                                                                                                       |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>path</b> <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.<br><br>If a directory path is not specified, then the search is performed in the current directory (a path of . (dot) is assumed). |
| <b>name</b> <i>filename-pattern</i> | (Optional) Searches for the name of the file. The <i>pattern</i> argument is a regular expression string.                                                                                                                                                                                             |
| <i>LINE</i>                         | (Optional) UNIX command-line expressions provided as a string.                                                                                                                                                                                                                                        |
| <b>user</b> <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.                                                                                                                                                                            |
| <b>usage</b>                        | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                       |

## Defaults

If a directory path is not specified, then the search is performed in the current directory.  
If a filename **name** *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

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 pattern** keyword and argument. Replace the *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 “hfr-fwdg-3.4.0”. 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-3.4.0
disk0:/hfr-fwdg-3.4.0
```

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:/hfr-base-3.4.0/etc/vim/doc/editing.txt
disk0:/hfr-base-3.4.0/etc/vim/doc/help.txt
disk0:/hfr-base-3.4.0/etc/vim/doc/intro.txt
disk0:/hfr-base-3.4.0/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             |
|-------------------------------|-------------------------|
| <a href="#">utility which</a> | 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 EXEC mode or administration EXEC mode.

**utility head** *[[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.                                                                                                                                                                                                                             |
| <b>bytes</b>        | (Optional) (-c) Copies the data in bytes from the beginning of each specified file. The default setting is to copy lines of data.                                                                                                                                                                               |
| <b>count number</b> | (Optional) (-n) Specifies the number of lines (default) or bytes to be copied. The <i>number</i> argument is an unsigned decimal integer.<br><br>By default, the <b>utility head</b> command copies the first ten units (lines or bytes) of the file. Use the <b>count number</b> option to change the default. |
| <i>file source</i>  | (Optional) Specifies the storage device, directory, and filename for the files.<br><br>If a file is not specified, the standard input is used.                                                                                                                                                                  |
| <b>usage</b>        | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                 |

## Defaults

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

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 keyword **usage**.

**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 command **show version**:

```
RP/0/RP0/CPU0:router# show version | utility head count 15
```

```
Cisco IOS XR Software, Version 3.4.0
Copyright (c) 2006 by cisco Systems, Inc.
```

```
ROM: System Bootstrap, Version 1.40(20060413:002654) [CRS-1 ROMMON],
```

```
router uptime is 5 days, 20 hours, 21 minutes
System image file is "disk0:hfr-os-mbi-3.4.0/mbihfr-rp.vm"
```

```
cisco CRS-8/S (7457) processor with 4194304K bytes of memory.
7457 processor at 1197Mhz, Revision 1.2
```

```
16 GigabitEthernet/IEEE 802.3 interface(s)
2 Ethernet/IEEE 802.3 interface(s)
20 Packet over SONET/SDH network interface(s)
```

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

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                                                                       |
|-----------------------------|-----------------------------------------------------------------------------------|
| <a href="#">utility cut</a> | Cuts characters or lines from the output displayed from standard input or a file. |

| Command                      | Description                                                                           |
|------------------------------|---------------------------------------------------------------------------------------|
| <a href="#">utility sort</a> | Sorts, merges, or sequence-checks the output displayed from standard input or a file. |
| <a href="#">utility tail</a> | 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 EXEC mode or administration EXEC mode.

**utility less** {[**exiteof**] [*WORD*] | **nocase** | **position** *line-number* | **startat** *string*} [**file** *source-file*]

| Syntax Description                 |                                                                                                                                          |  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>exiteof</b>                     | (Optional) ( <b>-E</b> ) Automatically exists 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.                                                      |  |
| <b>nocase</b>                      | (Optional) ( <b>-i</b> ) Ignores uppercase and lowercase distinctions during comparisons.                                                |  |
| <b>position</b> <i>line-number</i> | (Optional) ( <b>-j</b> ) Uses the line at line number <i>line-number</i> on the screen to position matched lines during a patter search. |  |
| <b>startat</b> <i>string</i>       | (Optional) ( <b>-p</b> ) Starts at the first occurrence of the pattern specified by the <i>string</i> argument in the file.              |  |
| <b>file</b> <i>source</i>          | (Optional) Specifies the storage device and directory path for the text file to be displayed. The default is standard input.             |  |
|                                    | The <i>source</i> syntax is: <i>device:/directory-path[/filename]</i>                                                                    |  |

**Defaults** If no text file is specified, standard input is assumed.

**Command Modes** EXEC  
Administration EXEC

| Command History | Release       | Modification                                                                                    |
|-----------------|---------------|-------------------------------------------------------------------------------------------------|
|                 | Release 3.5.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
|                 | Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
|                 | Release 3.7.0 | No modification.                                                                                |
|                 | Release 3.8.0 | No modification.                                                                                |

**Usage Guidelines** To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 keyword **usage**.

**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 EXEC mode or administration EXEC mode.

**utility mv** {[*WORD* | **force** | **interactive**] **source** *source-file* **target** *target-file* | **usage**}

## Syntax Description

|                                  |                                                                                                                  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>WORD</b>                      | (Optional) UNIX command-line option string. The maximum number of characters is 80.                              |
| <b>force</b>                     | (Optional) ( <b>-f</b> ) Forces an overwrite if the target file already exists. There is no confirmation prompt. |
| <b>interactive</b>               | (Optional) ( <b>-i</b> ) Specifies to prompt for confirmation before renaming a file.                            |
| <b>source</b> <i>source-file</i> | Specifies the storage device, directory, and filename for the file to be moved.                                  |
| <b>target</b> <i>target-file</i> | Specifies the new storage device, directory, and filename for the file.                                          |
| <b>usage</b>                     | (Optional) Displays the UNIX options supported by this command.                                                  |

## Defaults

No default behavior or values

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



### 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 keyword **usage**.

| 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                                                                           |
|------------------|------------------------------|---------------------------------------------------------------------------------------|
|                  | <a href="#">utility cut</a>  | Cuts characters or lines from the output displayed from standard input or a file.     |
|                  | <a href="#">utility sort</a> | Sorts, merges, or sequence-checks the output displayed from standard input or a file. |
|                  | <a href="#">utility tail</a> | 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 EXEC mode or administration 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>dict</b>                      | (Optional) ( <b>-d</b> ) Sorts in dictionary order. Uses only alphanumeric and blank characters in the sort operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>fieldSep</b> <i>character</i> | (Optional) ( <b>-t</b> ) Specifies a character as the field separator.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>ignoreblank</b>               | (Optional) ( <b>-b</b> ) Ignores leading blank characters in field comparisons.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>key</b> <i>key-definition</i> | <p>(Optional) (<b>-k</b>) Defines a key to be the sort key. A sort key field is defined using the following syntax:</p> <p><b>utility sort key</b> <i>field_start</i> [<i>type_string</i>] [<i>field_end</i>] [<i>type_string</i>]</p> <ul style="list-style-type: none"> <li><i>field_start</i> and <i>field_end</i>: Specifies the beginning and end of the key field.</li> <li><i>type_string</i>: Specifies attributes specific to the key.</li> </ul> <p>The <i>field_start</i> and <i>field_end</i> are each specified by a pair of digits of the form <i>m.n</i>, where the <i>m</i> refers to the field starting after the <i>m</i>th field separator in a line. For <i>field_start</i>, the <i>.n</i> refers to the <i>n</i>th character of the specified field, and is taken as zero if not specified. For <i>field_end</i>, the <i>.n</i> refers to the <i>n</i>th character after the last character of the specified field, and is taken as zero if not specified.</p> <p>The <i>type_string</i> may be formed from the characters <i>bdfinr</i>, which apply their defined attributes to the determination of the key.</p> <p><b>Note</b> 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.</p> |
| <b>lowercase</b>                 | (Optional) ( <b>-f</b> ) Folds uppercase letters into lowercase (ignores case and treats upper case characters the same as lowercase characters).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>merge</b>                     | (Optional) ( <b>-m</b> ) Merges sorted files. Assumes that the files are already sorted and so does not sort the files.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>numeric</b>                   | (Optional) ( <b>-n</b> ) 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 <b>ignoreblank</b> keyword).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>outfile</b> <i>filename</i>   | (Optional) ( <b>-o</b> ) Writes the results to a file. The <i>filename</i> is the destination disk, directory, and filename. The <i>filename</i> can be the same as the source file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>printable</b>                 | (Optional) ( <b>-i</b> ) Ignores all nonprintable characters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>reverse</b>                   | (Optional) ( <b>-r</b> ) Reverses the sort order. The sort is ascending by default.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|                             |                                                                                              |
|-----------------------------|----------------------------------------------------------------------------------------------|
| <b>unique</b>               | (Optional) ( <b>-u</b> ) Suppresses all but one line in each set of lines having equal keys. |
| <b>file</b> <i>filename</i> | (Optional) Specifies a file to be sorted.                                                    |
| <b>usage</b>                | (Optional) Displays the UNIX options supported by this command.                              |

### Defaults

If no file is specified, then the standard input (keyboard) is used.

If an **outfile** *filename* is not specified, then the standard output (display) is used.

The file is sorted in ascending order.

### Command Modes

EXEC

Administration EXEC

### Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

### Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



#### 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 keyword **usage**.

### 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                                                                                   |
|------------------------------|-----------------------------------------------------------------------------------------------|
| <a href="#">utility uniq</a> | Displays or removes repeated lines in a file.                                                 |
| <a href="#">utility cut</a>  | Cuts characters or lines from the output displayed from standard input or a file.             |
| <a href="#">utility tail</a> | Copies the end portion of the output displayed from standard input or a file.                 |
| <a href="#">utility head</a> | Copies bytes or lines at the beginning of the output displayed from standard input or a file. |

# utility tail

To copy the end portion of a file or the standard input, use the **utility tail** command in EXEC mode or administration 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>bytes</b>                  | (Optional) ( <b>-c</b> ) Copies the end of the file measured in bytes. The default is lines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>continuous</b>             | (Optional) ( <b>-f</b> ) 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.<br><br>The input file must be a regular file, not a terminal or a FIFO special file (a named pipe).                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>count</b> <i>number</i>    | (Optional) ( <b>-n</b> ) Copies the number of lines (default) or bytes specified with the <i>number</i> argument. The <i>number</i> range is 0 to 4294967295. By default, the last 10 lines are copied.<br><br>The <i>number</i> argument is a decimal integer that defines the location in the file to begin copying: <ul style="list-style-type: none"> <li>• Include the plus (+) character to copy from the beginning of the file.</li> <li>• Include the minus (-) character to copy from the end of the file.</li> <li>• Do not include a character to copy from the end of the file.</li> </ul> <b>Note</b> Select the <b>bytes</b> keyword to copy the information measured in a count of bytes. |
| <b>file</b> <i>input-file</i> | (Optional) Directory path and filename for the input file. If no file is specified, then the standard input is used.<br><br>The <i>input-file</i> syntax is:<br><i>device:[/directory-path]/filename</i><br><br>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols.                                                                                                                                                                                                                                                                              |
| <b>usage</b>                  | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Defaults

If the **utility tail** command is entered without keywords or arguments, the last 10 lines of the standard input are copied.

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 keyword **usage**.

## 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 command **show version**:

```
RP/0/RP0/CPU0:router# show version | utility tail count 10
```

```
By iox25.cisco.com in /auto/ioxws46/nightly/ci-34_hfr_06.09.13 for c2.95.3-8
hfr-base, V 3.4.0[4n_06.09.13], Cisco Systems, at disk0:hfr-base-3.4.0
Built on Wed Sep 13 22:04:26 UTC 2006
By iox25.cisco.com in /auto/ioxws46/nightly/ci-34_hfr_06.09.13 for c2.95.3-8
hfr-os-mpi, V 3.4.0[4n_06.09.13], Cisco Systems, at disk0:hfr-os-mpi-3.4.0
Built on Wed Sep 13 21:47:10 UTC 2006
By iox25.cisco.com in /auto/ioxws46/nightly/ci-34_hfr_06.09.13 for c2.95.3-8
```

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

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                                                                                   |
|------------------------------|-----------------------------------------------------------------------------------------------|
| <a href="#">utility cut</a>  | Cuts characters or lines from the output displayed from standard input or a file.             |
| <a href="#">utility sort</a> | Sorts, merges, or sequence-checks the output displayed from standard input or a file.         |
| <a href="#">utility head</a> | Copies bytes or lines at the beginning of 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 EXEC mode or administration 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>afterChars</b> <i>number</i>   | (Optional) ( <b>-s</b> ) 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.                                                                                                                                                                                                                                                                                                                                                         |
| <b>afterField</b> <i>number</i>   | (Optional) ( <b>-f</b> ) 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.                                                                                                                                                                                                                                                                                                                                                                 |
| <b>count</b>                      | (Optional) ( <b>-c</b> ) Displays the number of times the line appeared in the input file at the beginning of each output line.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>nonrepeating</b>               | (Optional) ( <b>-u</b> ) Displays only the nonrepeating lines from the input file (repeating lines are not displayed).                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>repeating</b>                  | (Optional) ( <b>-d</b> ) Displays only the repeating lines from the input file (nonrepeating lines are not displayed).                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>infile</b> <i>input-file</i>   | <p>(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.</p> <p>The <i>input-file</i> syntax is:</p> <p><i>device:[/directory-path]/filename</i></p> <p>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols.</p> |
| <b>outfile</b> <i>output-file</i> | <p>(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.</p> <p>The <i>input-file</i> syntax is:</p> <p><i>device:[/directory-path]/filename</i></p> <p>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols.</p>                   |
| <b>usage</b>                      | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Defaults

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**

EXEC  
Administration EXEC

**Command History**

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

**Usage Guidelines**

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 keyword **usage**.

**Task ID**

| Task ID   | Operations |
|-----------|------------|
| universal | execute    |

**Examples**

In the following example, the **utility unique** 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                                                                           |
|------------------|------------------------------|---------------------------------------------------------------------------------------|
|                  | <a href="#">utility sort</a> | 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 EXEC mode or administration 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.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>bytes</b>                  | (Optional) ( <b>-c</b> ) Displays the number of bytes in each input file.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>lines</b>                  | (Optional) ( <b>-l</b> ) (“ <b>l</b> ”) Displays the number of lines in each input file.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>words</b>                  | (Optional) ( <b>-w</b> ) Displays the number of words in each input file.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>file</b> <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.<br><br>The <i>input-file</i> syntax is:<br><i>device:[/directory-path]/filename</i><br><br>Include the alias for the <i>device</i> argument, followed by a colon, and, optionally, the name of a directory. Use the online help system to display the available storage devices and network protocols. |
| <b>usage</b>                  | (Optional) Displays the UNIX options supported by this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Defaults

Output is displayed in the order bytes, words, and lines, even if the options are entered in a different order.

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.                |
| Release 3.5.0 | No modification.                                                                                |
| Release 3.6.0 | The following devices were added: <b>disk0a:</b> , <b>disk1a:</b> , and <b>compactflasha:</b> . |
| Release 3.7.0 | No modification.                                                                                |
| Release 3.8.0 | No modification.                                                                                |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.

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 keyword **usage**.

**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 EXEC mode or administration 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.                                                           |
| <b>all</b>                         | (Optional) ( <b>-a</b> ) Displays all occurrences of the program specified by the <b>program</b> <i>pathname</i> keyword and argument.        |
| <b>fullname</b>                    | (Optional) ( <b>-f</b> ) Displays the full pathname of the program file.                                                                      |
| <b>long link</b>                   | (Optional) ( <b>-l</b> ) (“el”) Displays the long format for each program found, and also displays link information if the file is a symlink. |
| <b>program</b> <i>program-name</i> | Specifies the name of the program file.                                                                                                       |
| <b>usage</b>                       | (Optional) Displays the UNIX options supported by this command.                                                                               |

## Defaults

No default behavior or values

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                     |
|---------------|----------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. |
| Release 3.5.0 | No modification.                                                                 |
| Release 3.6.0 | No modification.                                                                 |
| Release 3.7.0 | No modification.                                                                 |
| Release 3.8.0 | No modification.                                                                 |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



### 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 keyword **usage**.

| 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:/hfr-base-3.4.0.1I/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     |
|------------------|------------------------------|-----------------|
|                  | <a href="#">utility find</a> | Locates a file. |

# utility xargs

To run a program from one or more argument lists, use the **utility xargs** command in EXEC mode or administration 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.                                                    |
| <b>trace</b>             | (Optional) ( <b>-t</b> ) Prints each program on standard error before executing.                                                       |
| <b>program</b>           | (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.                                                                                            |
| <b>usage</b>             | (Optional) Displays the UNIX options supported by this command.                                                                        |

## Defaults

If no program is specified, then the echo utility is used (the input lines are displayed).

## Command Modes

EXEC  
Administration EXEC

## Command History

| Release       | Modification                                                                     |
|---------------|----------------------------------------------------------------------------------|
| Release 3.4.0 | This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router. |
| Release 3.5.0 | No modification.                                                                 |
| Release 3.6.0 | No modification.                                                                 |
| Release 3.7.0 | No modification.                                                                 |
| Release 3.8.0 | No modification.                                                                 |

## Usage Guidelines

To use this command, your Cisco IOS XR software system administrator must assign you to a user group associated with a task group that includes the corresponding command task IDs. If you need assistance with your task group assignment, contact your system administrator. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.



### 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 keyword **usage**.



| 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
.....
```





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| <b>MPR</b> | Cisco IOS XR MPLS Command Reference                             |
| <b>QR</b>  | Cisco IOS XR Modular Quality of Service Command Reference       |
| <b>RR</b>  | Cisco IOS XR Routing Command Reference                          |
| <b>SMR</b> | Cisco IOS XR System Management Command Reference                |
| <b>SR</b>  | Cisco IOS XR System Security Command Reference                  |
| <b>VFR</b> | Cisco IOS XR Virtual Firewall Command Reference                 |

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